The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB

August 2024 Volume 30 Issue 8

The *Jersey Broadcaster* is distributed to members of the New Jersey Antique Radio Club via email as a PDF file. Back issues of many of our newsletters are available on the club's website: www.njarc.org/broadcaster/

Meeting Notice

Our August meeting will take place on Friday, 8/9 at Bowen Hall, Princeton. The topic will be "Why Does My Old Radio Sound Like Crap?" by Scott Marshall.

We plan to also livestream the meeting on our YouTube channel which can be found at https://www.youtube.com/user/NJARC

Meeting Review

At our July meeting, Jonathan Allen's presentation was about "RCA and the Sarnoff Museum."

A recording of the presentation is available on YouTube at https://bit.ly/3LW6L3a.

Recordings of many of our meetings are available on the club's YouTube channel: https://bit.ly/3yZ5yoR

Calendar of Events

August 9: NJARC monthly meeting, Princeton
August 16: HARPS monthly meeting, Suffern NY
August 24: NJARC Summer Repair Clinic, InfoAge
September 13: NJARC monthly meeting, InfoAge
September 20: HARPS monthly meeting, Suffern NY
September 19-21: Kutztown Radio Show
October 1-5: AWA Annual Conference, Henrietta NY
October 11: NJARC monthly meeting, Princeton
October 18: HARPS monthly meeting, Suffern NY
October 26: Fall Repair Clinic, InfoAge
November 8: NJARC monthly meeting, Princeton
November 15: HARPS monthly meeting, Suffern NY
Nov. 16: NJARC Fall Hamfest/Swapmeet, Parsippany
December 14: NJARC Holiday Party, Jackson
December 20: HARPS Holiday Party, Suffern NY
January 10: NJARC monthly meeting, InfoAge
February 14: NJARC monthly meeting, Princeton
March 14: NJARC monthly meeting, InfoAge
March 22: NJARC Spring Swapmeet (preliminary date)
April 11: NJARC monthly meeting, Princeton
April 25-27: International Marconi Day, InfoAge
April 26: NJARC Spring Repair Clinic, InfoAge

From the President's Workbench

Greetings Fellow Enthusiasts!

I am not sure how many years Signor Marconi has smiled down on 2201 Marconi Road, but he certainly did it again on Saturday, July 27th! Our Annual Hamfest Tailgate Swap Meet Show was a great success, thanks to perfect weather and our dedicated volunteers.

Over 30 vendors set up multiple tables, showcasing a variety of electronic collectibles ranging from battery sets to vintage power tools. While our attendance was slightly lower than last summer's show, perhaps because a beautiful beach day was more enticing than a trip to InFoAge.

We were thrilled to welcome the new ARRL Hudson Division Director Ed Wilson, N2XDD, who took the opportunity to introduce himself to our ham radio members. Ed has graciously agreed to be a guest speaker to our club in 2025, providing insights into the future of amateur radio.

Speaking of the ARRL, representative Bob Buus was once again present with his information table, a tradition he has maintained for at least the past 10 years at our shows.

I would like to extend my sincere thanks to Fred Wara and Bill Zukowski for their invaluable contributions in directing traffic and managing vendor check-in. Judith Shaw, Jerry Ingordo, and our club friend Paul Gelbman, deserve recognition for their dedication in staffing the buyers' entrance table. Due to a shortage of volunteers, Fred, Bill, Judith, Jerry, and Paul went above and beyond by taking on additional responsibilities, including setting

Continued on next page.

THE JERSEY BROADCASTER is the newsletter of the New Jersey Antique Radio Club (NJARC) which is dedicated to preserving the history and enhancing the knowledge of radio and related disciplines. Dues are $25 per year and meetings are held on the second Friday of each month either at InfoAge or at Princeton University. Neither the editor nor NJARC is liable for any other use of the contents of this publication other than for information.

PRESIDENT:
Richard Lee (914) 589-3751
radioricardo61@gmail.com

VICE PRESIDENT:
Sal Brisindi
email

SECRETARY:
(Position open)
email

TREASURER:
Harry Klancer (732) 238-1083
klancer2@comcast.net

NEWSLETTER EDITOR:
Dave Sica (732) 382-0618
newsletter@njarc.org

SERGEANT-AT-ARMS (WEST):
Darren Hoffman (732) 928-0594

SERGEANT-AT-ARMS (EAST):
(Rotating)

TRUSTEES:
Ray Chase (908) 757-9741
raydio862@verizon.net
Phil Vourtsis (732) 208-4284
philvourtsis@gmail.com
Bill Zukowski (732) 833-1224
n2yeg@optonline.net

TECHNICAL COORDINATOR:
Al Klase (908) 892-5465
ark@ar88.net

TUBE PROGRAM:
Ray Chase raydio862@verizon.net

SCHEMATIC PROGRAM:
Aaron Hunter (609) 267-3065
ahunter01@comcast.net

CAPACITOR PROGRAM:
Richard Lee (914) 589-3751
radioricardo@gmail.com

MUSEUM CURATOR:
Ray Chase (908) 757-9741

WEBSITE COORDINATOR:
Dave Sica webmaster@njarc.org

MEMBERSHIP SECRETARY:
Marsha Simkin (609) 660-8160
33 Lakeland Drive, Barnegat NJ 08005

President's Workbench
(Continued)

up tables, signs, cones, and the PA system.

Again "vogliamo ringraziare il Signor Marconi per una giornata meravigliosa" Yes, thanks for the marvelous weather, Signor Marconi! Yes, thank you for the marvelous weather!

— Richard Lee, President NJARC

Judith Shaw, Paul Gelbman, Jerry Ingordo at the entrance

NJARC president Richard Lee and the new ARRL Hudson Division Director Ed Wilson

Continued on next page.

President's Workbench
(Continued)

(Continued on next page)

President's Workbench
(Continued)

A little cutie named "Love" riding with her Dad

(Continued on next page)

Museum Musings

By Ray Chase

Member John Kummer obtained a RCA 862 vacuum tube at a sale on Long Island and offered it to NJARC for a very nominal cost. The RCA 862 (actually built by GE) was brought out in the late 1920's to supply AM transmitters in broadcast stations that were now being licensed to transmit with 50,000 watts of power. First use was by WTIC in Louisiana.

The tube is a water-cooled triode rated at 100 kW dissipation. Anode voltage rating is up to 20 kV and the filament required 33 volts at 207 amps. Amazingly, the Crosley 500 kW station WLW used 12 of them in the RF amplifier and 8 more in the audio modulator. In the mid 1930's, these tubes cost $1,650 in 1930s dollarsbut by 1953 one could be obtained for $1,322. The tripod shown in the picture is not part of the tube, it is a stand so the tube can be stored upright. In use, the long anode would be encased in a water tank for cooling. This tube appears to be used and came from New York City station

Data on the Anode ring

WEAF in 1938. WEAF changed to WNBC and then to today's call sign, WFAN. We have always wished we could find one of these tubes. Now we have to figure out how to display it.

Research for this article led to a very interesting concise history of station WEAF that is available at: theradiohistorian.org/weaf/weaf.html.

John Kummer and the tube

Repairing IF Transformers with Silver Mica Disease, or How I Stopped Worrying and Learned to Love SMD (continued from previous issue)

By Joe Divito

Now that I have it back together, what do I use for new capacitors?

The next step of course is installing the repaired IF transformer and installing the new modern capacitors to take the place of the removed mica sheet capacitor. You also need to know what value capacitance to use. We will cover both in this section.

First, you need a special type of capacitor that holds a steady capacitance regardless of heat or applied volt-

(Continued on next page)

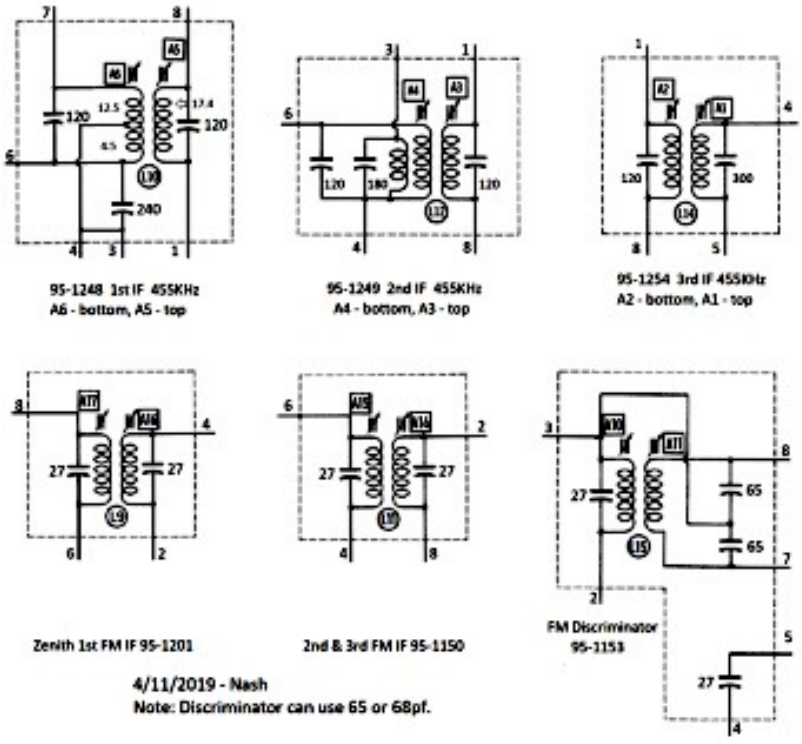
Repairing IF Transformers with Silver Mica Disease
(Continued)

age. They still make silver mica capacitors, though today's are hermetically sealed so they will never develop silver mica disease. It's likely they will outlive us collectors, and possibly outlive the radio you install them in too. Just like the better quality aftermarket manufacturers did back in the day (like Merit), you can also use ceramic capacitors, but you need a special type of ceramic capacitor. There are different grades of ceramic capacitors, and each type has different qualities. The one you want to look for has a rating of C0G or NP0 (NP0 being the older term for this type of ceramic capacitor.) C0G rated ceramic capacitors are designed to hold a zero drift in capacitance regardless of ambient temperature or applied voltage.

Here is an example of a good C0G ceramic capacitor to use, this being from the Mouser.com website. I have started switching over to using ceramic capacitors since they are smaller and significantly less expensive than silver mica capacitors.

Product Category:	Multilayer Ceramic Capacitors MLCC - Leaded
RoHS:	RoHS Details
Series:	GoldMax 300 Comm C0G HV
Termination Style:	Radial
Capacitance:	110 pF
Voltage Rating DC:	500 VDC
Dielectric:	C0G (NP0)
Tolerance:	5 %
Lead Spacing:	2.54 mm
Case Style:	Conformally Coated
Minimum Operating Temperature:	- 55 C
Maximum Operating Temperature:	+ 125 C
Product:	High Voltage MLCCs

Now the next challenge is knowing how to determine what value of capacitance to use. If you are lucky, the schematic might give the values, or an enthusiast may have dissected a few good ones in the name of science and measured the capacitor values and put them on the Internet. I started doing silver mica repairs on my Zenith radios before anything else simply because I found someone online who put up a web page (unfortunately no longer online) where he published schematics and capacitor values for several popular Zenith AM and FM IF transformers as seen in the illustration to the right.



(Continued on next page)

Repairing IF Transformers with Silver Mica Disease
(Continued)

If you aren't blessed with schematics to tell you the capacitor values, you need to find another way to determine it. There are many methods to do this. I initially did it by trial and error, using a default assumption that it would likely be 100 pf (pf = picofarads), and that seemed to work most of the time. However, that assumption wasn't always good, and I needed a better solution. I studied some how-to videos such as from the Shango066 YouTube channel where he temporarily tacks in variable (adjustable) capacitors that cover a range of pica farad values, and adjusts them to peak the alignment. Shango then removed and measured their capacitance value, then permanently installed that value fixed capacitors.

Since that seemed like a lot of work, I knew there had to be a better way. Studying the theory of how resonant circuits work, I learned that it's possible to solve for the unknown capacitor value if you know the two other values: the target resonant frequency and the inductance of the transformer coils. In fact, there are resonant frequency calculators available online that let you plug in your known values and it does all the math for you. My favorite is this one (it even provides the formulas for you die-hards who want to do the math yourself): https://goodcalculators.com/resonant-frequency-calculator/

I now use two inductance meters, an Atlas LCR45 (the more expensive but better quality meter) and an LC200A L/C meter:

In the LC200A picture, you are seeing me measuring the inductance for one section of the IF transformer. What you do is measure across the coils as you see above to get the inductance. Here, it measures 1.031mH. This transformer will be for a radio with a 455kHz intermediate frequency, so we want the transformer coils to both be resonating at that target frequency. So we go to the inductance calculator online application I linked above and plug in the frequency and measured inductance (be sure to select the right units of measure, KHz and mH). In this example, the calculator will return a needed capacitance of 118.67pf. I used a 120pf capacitor when I installed this transformer, and needed only a slight adjustment to the ferrite slug to align it. I find it best before making your measurements to make sure the ferrite slugs aren't already turned too far to one end or the other of their range of adjustment—this gives you more room to play with to compensate for having to round up/down to capacitor values you have available, and to compensate for any minor measurement errors. After all, it's highly unlikely you will be able to find a mica or ceramic C0G capacitor that's exactly 118.67pf!

Although I have never had a problem with this method, last summer I did unwittingly have a good sanity check of how accurate this method is for calculating an otherwise unknown capacitor value. I had an early 1960s RCA radio with silver mica disease where I did my usual process of extracting the mica sheet and measuring the inductance. It was only after I had installed and aligned the radio that I noticed on the SAMs schematic that RCA actually **did** publish the capacitor values! I had been so used to not having that information it

(Continued on next page)

Repairing IF Transformers with Silver Mica Disease
(Continued)

it didn't occur to me to look for it. The schematic clearly showed RCA used 100pf capacitors for both coils on the IF transformer I repaired. My method derived a calculated value of 110pf. Even so, I only needed less than half a turn of the ferrite slugs to peak up the alignment.

Putting Everything Back in Your Radio

Now for the time to install your repaired transformer. I usually solder in the replacement capacitors after the IF transformer is mounted back in the radio. Be sure you install your transformer in the exact orientation it was before (you did remember to make some notes and take pictures of what goes where?). Often I find it easier to leave the leads of the new capacitors intact and loop them to make a new solder point if there's a lot of stuff that has to go back and there's not enough room with one more part "in there." Here are a few examples below. Note that you are soldering the capacitors across the coils, be sure to put the right values to match up to each section. I write down the inductance measured and as calculated capacitance values right on the IF transformer so I keep straight where to put each replacement capacitor and make sure the right values go to the right pair of transformer terminals. I use a sharpie, which can be cleaned off with some isopropyl alcohol and a Q-tip if I want to remove my notes after everything is working.

Final Thoughts

It may seem complicated, but it really isn't that difficult with the right tools and some practice. Over time, I have been able to remove a mica sheet in about an hour. Usually the most challenging part for me is the removal from the radio—making sure I have good pictures and notes of where everything needs to go, including marking how the transformer needs to be oriented when I reinstall it. It's a very satisfying process taking these things apart and making them play once again. Give it a try and don't listen to the naysayers who shy away from silver mica disease repair.

Results of 2024 Ham Radio Field Day

By Nevell Greenough

Field Day 2024 produced even better results than last year, despite the heat! Here's the information from our submission to ARRL:

Call Used:	W2RTM
GOTA Station Call:	(NONE)
ARRL/RAC Section:	NNJ
Class:	2A
Participants:	10
Club/Group Name:	New Jersey Antique Radio Club
Power Source(s):	Battery
Power Multiplier:	2X
Preliminary Total Score:	2,106
Bonus Points:	
100% emergency power	200
Public location	100
Safety officer	100 - Documented by W2RTM FD2024Safety.jpg
Entry submitted via web	50
Total bonus points	450

Score Summary: (Cabrillo log/dupe sheet file: W2RTM2024.dup)

	CW	Digital	Phone	Total
Total QSOs	124	0	580	
Total Points	248	0	580	828

Claimed Score = (QSO points x power multiplier) = 1,656

Submitted by: Nevell Greenough

Band/Mode QSO Breakdown:

	CW		Digital		Phone	
	QSOs	Pwr(W)	QSOs	Pwr(W)	QSOs	Pwr(W)
160m						
80m	27	100			4	100
40m	44	100			485	100
20m	53	100			91	100
15m						
10m						
6m						
2m						
222						
432						
Other						
Satellite						
GOTA						
TOTAL	124		0		580	