



New Jersey Antique Radio Club News

Volume 2

Spring 1994

Number 1



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The New Jersey Antique Radio Club News is published quarterly, on a volunteer bases, by and for members of the New Jersey Antique Radio Club. The New Jersey Antique Radio Club News is distributed by mail to club members. NJARC can not be responsible for transactions between buyers and sellers advertising in the newsletter.

Dues and address changes: Kathleen Flanagan, Secretary, 92 Joysan Terrace, Freehold, NJ 07728 (908) 462-6638. Make check payable to NJARC. Dues: \$10.00 per year (includes NJARC News). A one dollar donation is collected at each meeting to help offset the cost of the meeting space rental.

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Newsletter Editor: David Sica (908) 382-0618

Trustees: Mark Mittleman, Ludwell Sibley

Calendar of Events

May

28 NJARC Spring '94 Swapmeet

June

10 Regular monthly meeting
17 MAARC "Radioactivity '94"
26 Delaware Valley Historic Radio Club Swapmeet

July

08 Regular monthly meeting

MEMBERSHIP BENEFITS

- Monthly Meetings
- Technical Seminars
- Swap Meets
- NJARC News
- Free Buy/Sell Classified Ads
- Tube Program
- Tube Testing
- Informal Networking with local collectors.

Monthly Meetings. Collectors in the New Jersey have an opportunity to get together with other collectors on a regular basis to keep abreast on what's happening in the field.

Technical Seminars. Featured presentations at the monthly meetings focus on various issues related to collecting antique radios. At our past meetings, we've covered topics from Vintage Equipment operating demonstrations to Restoration Safety.

Swap Meets. Held 3 times annually, the NJARC Swap Meets have become the most eagerly awaited events of the year. Vendors from near and far gather to offer a rich and varied assortment of radios and related items for sale.

NJARC News. The club newsletter serves to keep members informed about club events, providing notice of upcoming events, reviews of past events and other club-related information. The newsletter also serves as a forum for member interaction and offers free classified ads to members and non-members alike for the purposes of buying, selling or trading radio-related items.

Tube Program. The club offers tested, cleaned and boxed tubes to members at bargain rates. Tubes are available at each meeting, and all proceeds benefit NJARC.

Tube Testing. Members can bring tubes to any meeting for free testing on a high quality tube tester.

Networking. Collectors have an opportunity to get together with those of like interests to share tips, techniques and "war stories" and socializing. NJARC offers the opportunity for collectors from all over the area to share their expertise and their experiences.

FROM THE BOARD ROOM

Election News

NJARC elections are coming. The term of office for NJARC officers is two years. The current term expires this year.

Nominations will have been accepted at our May meeting. Voting will take place at our June meeting to elect a slate of officers for a two-year period.

The following members have been nominated:

President:

- Tony Flanagan (incumbent)

Vice President:

- Mike Hammer (incumbent)
- Jim Whartenby

Secretary/Treasurer:

- Kathleen Flanagan (incumbent)

Sgt. at Arms/Steward:

- Don Cruise (incumbent)
- Marv Beeferman

Election News (continued)

Trustee:

- Mark Mittleman (incumbent)
- Dave Sica

Election Results will be announced at the July meeting and in the Summer issue of NJARC News.

Upcoming Meetings

At our June meeting, Jim Whartenby will present part two of his talk on "The Superheterodyne". Part One consisted of a overview of basic superhet theory. Part two will continue with a more in-depth theoretical look at this ubiquitous receiver circuit.

In July, "Jim will continue with part three of his trilogy. In this installment, he will demonstrate practical alignment techniques for various types of superheterodyne receivers.

THE PRESIDENT'S BROADCAST

by Tony Flanagan

Keeping the Ball Rolling

This June, we're having elections for NJARC's executive board positions. I'm running again for President and I'm happy to do so because I worked hard to help form this club and I believe in it. And I want to continue to do my part to make it an even bigger success in the future.

We've got a great bunch of other folks working for the club too. All of our incumbents are up for reelection, and a couple of new names are on the ballot too. All of the people running for these positions have been great in volunteering their time and efforts. Each and every one of them are great supporters of the club, and I couldn't have done it without them. Whoever wins, we're guaranteed a great slate of officers for the next two years as our club continues to grow.

But the club won't run on just the efforts of these individuals. For all you new members, as well as those of you who've been around for a while in the background: don't be afraid to dive in!. This organization runs on the energy of its volunteers. We've got a lot of opportunities for people to get involved, and your expertise or lack of it is no barrier to active club participation.



The more ways we can split up the many little tasks which need to get done to keep the club going, the easier it is on all of us. And the better the club will be for all of us! Or to look at it another way, if we don't have the resources to get certain things done, they just won't get done... and we'll all be the worse off for it.

So what can you do? Make a presentation at a meeting. Write an article for the newsletter. Help out with publicity or with the tube program. Develop a new program for the club! Volunteer an hour or two of your time to work at a swapmeet. Plan a picnic. Do anything you can which will improve our situation and make NJARC a better place to belong.

So pitch in, it sometimes takes a bit of effort, or getting up early, but it's not like it's work. It's a hobby and a great one at that. Put your time and talents in and you'll reap a better reward than if you just sit back and watch.

And above all, make sure to have a good time!

Tony Flanagan

TUBE CARTONS OF NEW JERSEY MANUFACTURERS

By Ludwell Sibley

Northern New Jersey was once pretty much the center of the tube industry in North America, and perhaps the world. This holds in terms either of "makers per square mile" or of total production. Tubes came from the big plants of RCA at Harrison and Westinghouse at Bloomfield, as well as from the littler producers. The smaller makers, constantly appearing and vanishing, formed an entertaining counterpoint to the majors. It would be enlightening to know how many of the 470-plus known brands of 201A tubes were made within 20 miles of Newark!

MIGHTY RCA

RCA started by distributing tubes made by GE and Westinghouse, then bought the former GE Mazda lamp factory at Harrison. With near-monopoly market power, the company originally didn't have to use eye-catching or complex (read: costly) designs for its tube cartons. RCA's patent agreements forced set makers who took out patent licenses to equip their sets with RCA tubes. Fig. 1 shows an utterly plain RCA carton design from the early '20s: simple red printing on tan cardboard.



Figure 1.

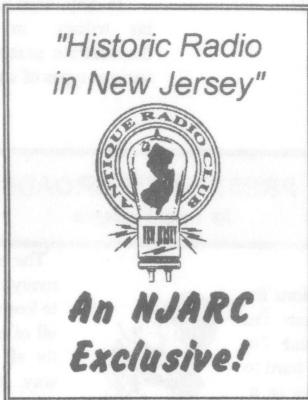


Figure 2.

Responding to the growing competition, RCA went to this frou-frou design in the late '20s (Fig. 2). The design uses the red and black colors familiar on RCA cartons to the end in 1975.



Figure 3.

By the early '30s, RCA had simplified its carton design. Fig. 3 shows a variant of the standard design of the time, a relic of RCA's acquisition of the De Forest Radio Company of Passaic. For a year or so afterward, RCA sold transmitting tubes under an "RCA-De Forest" name. This stubby carton contains an early 955 acorn tube, ca. 1933, which was considered a transmitting product. Not long after, the "DE FOREST" lettering became "RADIOTRON".

Incidentally, the question has come up as to what box style RCA used for its initial, all-black, steel-stamped metal tubes in 1935-36. The suspicion is that the first ones were sent out to radio manufacturers in bulk "flats" of a hundred or so. RCA had major problems getting a high enough production yield, and faced a huge manufacturing demand for the early production. Hence the belief that, by the time production was enough to satisfy the replacement market with individually boxed tubes, RCA had converted to ink-stamping.



Figure 4.

RCA tubes were also marketed under the name of Elmer T. Cunningham, originally of San Francisco. This orange-on-dark-blue carton depicted in figure 4 dates from the '30s and contains an ST-bulbed 37. It is still stapled shut "for the buyer's protection." E. T. himself began as the source of the name Remler ("Elmer" spelled backward, with an "r" added), and ended up as president of the RCA Radiotron Company.



Figure 5.



Figure 6.

The '30s was a time of world exploration, round-the-world flights, plus the opening of airline service to the Caribbean, South America, and China. From 1939 to the start of WW II, RCA celebrated with an elaborate four-color design for its transmitting tubes. The legend GIVES BETTER PERFORMANCE THROUGHOUT THE WORLD occupies all four sides, as does the map. The tube inside this 9" box is an 845. Address on the box is Camden, but the tube is doubtless a Harrison product - RCA's Lancaster transmitting-tube plant wasn't built until 1942.



Figure 7.

THE INDEPENDENT MAKERS

Arcturus was a major independent producer, from 1927 to about 1941. It was an innovator, known for tubes for early AC-operated receivers, the Wunderlich detector, and such novel designs as the PZ (a. k. a. 47), LA (6A4) and PZH (2A5). Their blue-glass products are collectible in their own right. Colors on this carton are - what else? - sky blue and black.



Figure 8.

Ever modest, Lee de Forest styled himself "The Father of Radio." His firm(s) made receiving and transmitting tubes throughout the '20s in Jersey City and Passaic. Originally using a lithographed round tin can for his "DV" and "DL" types, by the end of the decade he had gone to a more affordable cardboard box. Both were orange-and-black layouts.



Dumont, from Passaic, was best known for high-end, big-screen TV sets, laboratory oscilloscopes, and the ill-fated "fourth" TV network. However, it did market receiving tubes. After the demise of the original company, the trade name Dumont continued in use into the Sixties. Colors are yellow and green on white.



Figure 9.

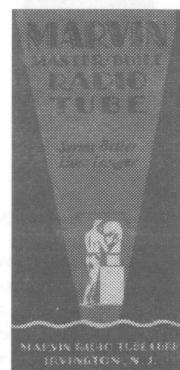


Figure 10.

Marathon products came from the Northern Manufacturing Company in Newark. This was a 201A carton. Ready for the Olympic 26-km tube-carry event.

201A and 421A tubes were used in early television sets and in the first television cameras.

Other tube firms never made such good ones.



Perhaps better known as the home of Lionel toy trains, Irvington had at least one tube maker. This Marvin 201A box is deep orange and green on black.

Figure 11.

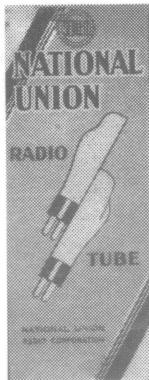


Figure 12.

National Union was a Newark operation from 1930 to the early '50s. It was the "union" of local companies Magnatron, Marathon, Sonatron, and Televocal. This box design is yellow, black, and silver on light green. The tube inside is an ST-bulb 201A.



Figure 13.



Figure 14.

Sonatron's headquarters were in Chicago, but the carton claimed additional addresses in Detroit, Windsor, New York City, and Newark. The latter was doubtless the manufacturing site, since Sonatron resources later went into National Union. Colors are red and black on buff cardboard.



Figure 15.

The Sunlight Lamp Company of Newark brought us "Crusader" tubes. Most of us are content if a tube just detects or amplifies, but these guys were ready to capture the Holy Land. Strong colors to match the brawny swordsman: red, yellow, and black. Look out, you infidels.



Figure 16.

Tung-Sol was one of the many lamp makers that added tubes - and later went to transistors and even integrated circuits. Here is a wartime carton for one of their products, a 6K6G. This particular tube marched off to war as a Signal Corps spare for a BC-348N aircraft receiver, then trooped back as War Assets Administration surplus.

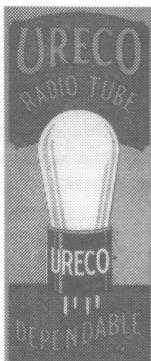


Figure 17.



Figure 18.

DISTRIBUTOR PACKAGES

A distributor brand, NJRT, from Elizabeth. Design is brown on light green, and the tube is a 6CD6 from the mid-'50s.



This Purotron carton, containing a 6Z7G, looks like an independent product. However, examination of the cardboard retainer inside, and of the tube itself, indicates it came off an RCA line in the late '40s. Colors: orange and green.

Figure 19.

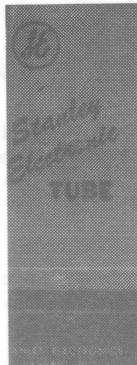


Figure 20.

Here's a private-brand distributor box, from Stanley Electronics of Passaic, probably dating from the '50s. Design is orange on blue.

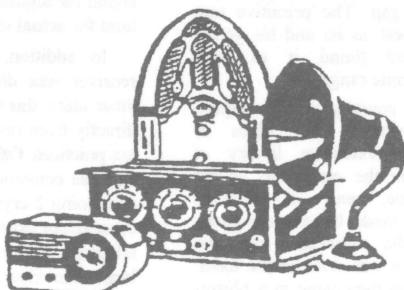


Figure 21.

Another distributor pack, "Variety," from Newark. Note the variety of spaces to mark which maker's tube was inside. Colors: red and black. As with many private-label cartons, another firm (Parts Unlimited) used this graphic design unchanged.

Delaware Valley Historic Radio Club
P.O. Box 624, Lansdale PA 19446 (215) 368-2520

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MEETING REVIEW

By Dave Sica

Friday, January 14: Bill Stokes "Home Brew Spark-Era Equipment"

At our January meeting, club member Bill Stokes displayed pieces from his remarkable collection of home-made spark-era transmitting and receiving equipment.

Original examples of such very early pieces of equipment just don't show up too often any more at garage sales, flea markets or auctions. Most of the real "artifacts" of the industry are already in museums or in the hands of collectors. But it is still possible to build new, old-style equipment from a combination of new and old materials. In this way, collectors can experience the very beginnings of the wireless industry even if they are not lucky enough to own a lot of the actual original equipment from that era.

One item on display, while technically "wireless", was certainly not a radio. The Heliograph is a device that send signals on a beam of light, by code. Heliographs were used by professionals like surveyors and geologists to communicate over fairly long line-of-sight distances outdoors. Bill's "Colt" brand heliograph is an original piece, not a reproduction. It was patented in 1904 and used acetylene gas, produced on-board by a carbide acetylene generator. (And no, he didn't fire it up to demonstrate it in operation!)

Bill's experience in radio goes way back: to his boyhood. One of his projects consisted of a transmitter made from a Model "T" spark coil, condenser and spark gap. The primitive unit worked surprisingly well, as he and his young friends tested it and found it to have approximately a three mile range!

Bill stated that to construct replica equipment, he usually works from plans or illustrations from his extensive library of original literature from the early part of the century. At that time, nearly all wireless equipment was home made by experimenters, and Bill constructs the equipment from the original plans, just as it was done in the teens. As Bill puts it "Nothing then came in a blister-pack - you built every part yourself!" Part of the appeal of Bill's collection is that it includes a replica of that original spark transmitter he built in the fifth grader in 1938.

Bill has some fond memories of that boyhood transmitter, particularly about how he found out that the strength of his transmitter proved rather infuriating to the neighbors. Spark transmitters are notorious for radiating broad band interference, and this phenomenon plagued

all those unlucky to be in the vicinity of Bill's experiments. Bill was made aware of this one day when the "friendly" local policemen came knocking on his door to inquire about the subject.

Part of Bill's demonstration included actual operation of the replica transmitter. Since spark transmission is as illegal now as it was in 1938, Bill prudently elected to operate the unit into a dummy load. (Was it my imagination or did he seem to keep looking over his shoulder for a friendly local policeman during the demonstration?) The unit produced enough energy to light up a fluorescent bulb!

Bill also demonstrated detector assemblies of teens-vintage construction. One unit shown was of the coil/slider construction, with

crystal detector. As with any crystal set, this unit is capable of providing headphone reception on strong stations.

Also demonstrated was a test buzzer, essential equipment in the crystal detector era. Since a sensitive spot must be found on the crystal by trial-and-error positioning of the cat's whisker, it helped enormously to have a reliable source of broad-band rf feeding the unit under adjustment. The test buzzer, functioning as a miniature spark transmitter, provided the signal for adjusting the detector, after which the hunt for actual stations could begin.

In addition, a home-brew loose coupler receiver was displayed. As with most of the other units, this was constructed by Bill himself directly from raw materials, according to teens-era practices. Other equipment on display which Bill has constructed included a crystal detector containing 2 crystals, one contacting against the other (from original plans!), and a high-current telegraph key machined from solid brass with large coin-silver contacts. Of particular note is that the complete wireless receiver setup exhibited was the centerpiece of a display which took first prize in its class at last year's AWA conference in Rochester, and was featured in an AWA *Old Timers Bulletin* article.

Bills remarkable collection demonstrates what a little craftsmanship and a good machine shop can do. And it doesn't hurt either to have walnut trees on your property and a neighbor who knows how to saw them!



MEETING REVIEWS

By Dave Sica

Friday, February 11: John Ruccolo
"Restoration Safety"

Although our February meeting took place during one of those seemingly unending vicious snowstorms, over a dozen hardy members came to Freehold, whether by dog sled, snowshoe or cross country ski.

It's unfortunate that so few were able to attend, since John Ruccolo's presentation was of interest and importance to all. Speaking on "Troubleshooting Safety", John offered tips and techniques on how to avoid damaging your set or yourself while engaged in troubleshooting.

John's presentation focused on three major issues: the hazards of transformerless "AC/DC" sets, protecting yourself by using a Ground Fault Interrupter (GFI) outlet, and protecting a set under test through the use of a variable transformer (Variac).

John has summarized his presentation in the accompanying article "Radio Troubleshooting Safety", and due to the importance of this topic, he has agreed to repeat the presentation at another (presumably Summer) meeting.

Coming Up In NJARC News

- A series on HiFi Tube Audio
- The Little Nipper Division of RCA (Another installment in the series "Historic Radio of New Jersey")
- More Book Reviews
- More Member Profiles

Friday, March 11: Film Screening: "Electrons On Parade"

At our March Meeting, Ludwell Sibley provided a film from the AWA archives: "Electrons On Parade". This 1930s era self-promotional RCA program featured a sometimes amusing (from a 1990s perspective) look at the "state-of-the-art" some 60 years ago.

Providing a "behind the scenes" look at vacuum tube manufacturing at RCA, the program drew appreciative responses from the audience regarding its in-depth look at manufacturing techniques which are now a part of history. The film also elicited comments from the audience regarding several scenes depicting a work environment with an apparent disregard for OSHA regulations... regulations not yet a gleam in your government's eye in 1937.

Following the manufacturing tour, we see boats, trains, planes. We see scenes of studious schoolchildren and earnest-looking police who may have studied at the Keystone Cops academy. All the while the announcer intones in his best "newsreel" voice that: "The safety of ships at sea... The lives of flyers and their passengers... The health of a nation... The protection of a community from crimes and violence... The education of our children... The advancement of science... All these, and many others, are important services of the *vacuum tube*." To which we surely were expected to mentally add "the *RCA vacuum tube*!"

Thanks to Ludwell Sibley for making this film available to the club, and special thanks for also stepping in as "guest soundtrack announcer" after the vintage sound system soured halfway through the film! Having heard both versions of the soundtrack, I found Lud's to be more entertaining!

Treasurer's Report

as of March, 1994

Previous Balance	\$2,824.74	Expenses:	
Receipts			
Membership dues, new members	180.00	Meeting room rental	75.00
Membership dues, renewals	40.00	Awards/Plaques	137.89
Attendance fees	77.00	Postage	155.24
Tube program	505.00	Scrapbook	21.20
20/20	44.50	Meeting Refreshments	14.65
Sale Proceeds	18.00	Logo (jackets)	262.27
Refund on Christmas Party	10.60	Printing (newsletters)	350.22
Book sales: "Philco Radio"	211.00	Books ('Philco Radio')	286.00
Newsletter advertising	30.00	Advertising (A.R.C.)	12.10
Table Rental, Feb. meet	531.00	Advertising (NY Daily News)	69.00
Admission and food sales, Feb. show	630.65	Hightstown Country Club (Feb. meet rental)	350.00
Interest	20.06	Food (Feb. meet)	149.81
Total Receipts	\$2,297.81	Insurance	201.00
Balance	\$5,122.55	Total Expenses:	\$2,084.38
		New Balance:	\$3,038.17

MEETING REVIEW

By Dave Sica

Friday, April 8: Mark Mittleman "Regenerative Receivers"

At our April meeting, Mark Mittleman brought in some of his extensive collection of 1920s era battery sets to serve as demonstrations for his talk on "Regenerative Receivers".

Mark informed the group that the regenerative circuit was born about 1911 and patented in 1914 by Edwin Armstrong. Mark noted that Armstrong sold patent rights to RCA, and both Armstrong and RCA licensed the rights to other manufacturers. Any company that wanted to use a regenerative circuit in their receivers had to pay royalties. Several radios were on display. Most of the regenerative sets manufactured were licensed, but many were not. On display was a particularly interesting non-licensed set, offering a glimpse into the extent of the some of most blatant disregard for the regenerative patent at the time. Most manufacturers of non-licensed sets were taken to court and quickly convinced to mend their ways, or were put out of business, but several companies developed rather creative ways to effectively circumvent the licensing requirements. These companies found legal, if ethically questionable, ways to sell sets which did not regenerate, but which were constructed so that the buyer could easily add this feature. Through such schemes, several companies effectively bypassed the letter of the licensing law.

Mark noted that a regenerative circuit basically differs from a non-regenerative circuit merely through the addition of a "tickler" coil which couples part of the output of the detector tube back to its input. Careful adjustment of the amount of coupling allows the signal to be fed back for re-amplification, offering greatly increased sensitivity.

One company which successfully marketed legal non-regenerative sets which were capable of becoming regenerative in the hands of the user was the famous Atwater Kent. Their "breadboard" sets were sold without a tickler coil, but the coil was readily available as a separate component. The owner of a set simply purchased the coil and installed it himself. Atwater Kent even supplied the instructions and the diagrams on how to do it. Nearly anyone could make the modification, since it only involved connecting two wires! At that point, the Atwater Kent set would regenerate. Mark stated that he has never seen ad for an Atwater Kent breadboard that did not feature this "tickler" coil. The company never advertised that they made regenerative radios, since was against the law. What they did clearly imply was that they offered a radio which was easily converted to regenerative operation. And they got away with

it! The company continued this practice successfully for five years, until they started manufacturing the newer TRF sets.

Other manufacturers, like A.C. Gilbert and Davis Radio Company of Keyport also designed "legal" non-regenerative sets, which included as part of their design pins on the front panel where the owner could join circuits together to make the radio regenerative. This also effectively bypassed the patent. Other manufacturers offered kits. They did not sell regenerative radios, only parts. When you bought the kit and followed the assembly instructions, you ended up with a regenerative radio. Again, this scheme apparently got around the licensing requirements.

Some companies didn't bother with the subtle approach. An example of one of the more blatant examples of disregard for the regenerative patent was a side-by-side display of two pieces from Marks's collection. The first set was a relatively obscure receiver manufactured by Bates Radio Company of New York. Next to it was a set by Grebe, one of the major manufacturers of the day. With a glance, it was obvious that the Bates set was an exact copy of the Grebe. Every tap switch, every knob, every dimension of the cabinet on the Bates was identical to the Grebe. Inside, every single component was the same, installed in the same way, in the same position in both sets. Of course, Grebe immediately took Bates to court and put them out of business.

The regenerative circuit was a good design, providing a more sensitive receiver than any other design, but it was notoriously difficult to operate and tended to drift, particularly the early designs. In a more refined incarnation, certain aircraft radios continued to use regeneration into the 1940s.

One of the most significant drawbacks of the regenerative design is that if you increased the regeneration too much, the circuit would begin to oscillate, in effect becoming a tiny radio transmitter. This would send a radio signal back out your antenna to interfere with your neighbor's reception. The regenerative circuit did not help to foster good relations among early radio enthusiasts!

Even with it's many drawbacks, the regenerative circuit offered the superior performance of the time. Because of this, even with the legal shenanigans some manufacturers resorted to, most regenerative sets of this era were duly licensed and royalties paid.. Mark stated that "every licensed manufacturer listed their patent rights listed

Continued on page 15

RADIO TROUBLESHOOTING SAFETY

By John Ruccolo

Introduction

This article is about troubleshooting safety while testing and repairing vintage radio equipment. This article discusses some simple (but hopefully informative and illustrative) demonstrations which were made at my presentation to NJARC this past February.

As you may know, many vintage sets are actually dangerous to work on, even when they're still in the cabinet. Most of these are the so-called "AC/DC" sets that were popular from the mid '30s to the mid '60s. Many of these contained exposed metal parts (screws that held the chassis in and the back on, for example) that you don't want to come in contact with under the wrong circumstances. Here's why:

AC/DC?

Some of these sets, particularly the earlier ones, had one side of the AC line cord connected directly to the chassis. This means that depending on which way the plug is inserted into the outlet, the chassis has a 50/50 chance of being "hot" (remember, this was before the days of "polarized" plugs and outlets). This means that if you come in contact with the chassis, while also touching something grounded (a water pipe, radiator, another grounded piece of equipment, etc.) you will receive a potentially lethal shock.

Surprisingly, a number of highly collectible sets (including Catalins) fall into this category. Two popular makes that were built this way were Fada and Emerson. In my demonstration, I used an old Emerson I had kicking around. (And yes, I stole the idea for this demo from an article by our own Ludwell Sibley in the AWA Old Timer's Bulletin.)

Isolation Transformers

In order to keep from being fried, we want to provide isolation from the AC line; in other words, we want to fix things so it doesn't matter which way the plug is inserted. This is accomplished with a device called an isolation transformer. This transformer accepts 120 volts in (though some have switched ranges from about 105 to 125 volts) and provides 120 volts at its output. Neither side of the output from the iso transformer is "hot" with respect to ground; now it doesn't matter which way the line cord is plugged into the transformer. Naturally, you can still get shocked while carelessly poking around *inside* the live chassis, but the iso transformer eliminates the shock hazard while you're just casually checking out the unopened set.

So where do you get one of these? Well, they're still available from leading distributors

(such as Allied), but they're expensive new. The one I use is listed in the '93 Allied catalog for \$92 and change! But mine was purchased at a ham fest for just \$5. While I'm on the subject of ham fests, I'd encourage you folks to check out a few. Antique radios *do* turn up at hamfests (along with lots of other old weird stuff), but even better, they're a great place to obtain tubes, parts, test equipment, accessories, etc. a bargain prices. Also, you might find one of these at an antique radio meet or a "regular" flea market.

Also, you can build your own isolation transformer from two *identical* ordinary 120 volt step-down transformers. Surplus transformers with 120V primaries and low-voltage secondaries are very easy to find at radio meets and hamfests. Connect the transformers "back-to-back", secondary (low voltage side) to secondary. (It doesn't matter what the secondary voltage is; the transformers typically can be anywhere from 6 to 25 volt output as long as they are the same.) Connect a line cord to the 120V side of one transformer, and connect a receptacle (you can even use an extension cord with the plug cut off) to the 120V side of the other transformer. Insulate all connections carefully. I recommend that you use electrical wire nuts and mount the transformers inside some kind of cabinet, but you could just mount them on a piece of wood. Now you've got your own "home brew" iso transformer!

Variable Autotransformers (Variacs)

Unfortunately, while the iso transformer helps protect you, it doesn't do much to protect the equipment under test. Radios that have been sitting in a damp basement for decades don't always respond politely to having themselves plugged in and zapped with 120 to 125 VAC. We need a way to gradually raise the voltage on the radio under test so that we can look for signs of trouble (smoke, hissing sounds, sparks, etc.), and shut things down quickly if we spot trouble. This leads us to our next chapter...

In order to test these (and any other AC operated sets) safely, you need a way to gradually raise the voltage applied to the set to 120 volts, rather than just plugging the thing in and zapping it. This is where a variable autotransformer, commonly known as a Variac, comes in. Variac, like Kleenex or Xerox, is a trade name that has become generic, at least by electronics hobbyists. Variacs were probably the most famous products produced by the old General Radio Corporation, now known as Genrad. (The name is pretty clever; I suppose it came from Vary AC, get it?). Other popular makes were Superior Electric Powerstat and

Continued on following page.

RADIO TROUBLESHOOTING SAFETY

(continued from preceding page)

Staco.

Variacs (we'll call them this since it's a lot less typing than variable autotransformer) come in many shapes and sizes. The one I brought is a typical one for electronic equipment servicing. Like iso transformers, these are very expensive when purchased new, but relatively cheap and easy to find at hamfests and flea markets. This one was purchased at a hamfest for \$5 (No, I'm not gonna do the hamfest "plug" again). Expect to pay from \$5 to \$25, sometimes more, depending on condition, size, etc. Some even have meters for voltage and current, but these can get expensive. Look for one rated at between 5 and 10 amps; this is fine for testing even the biggest console radios and TVs.

A key thing to remember is that the Variac is not a transformer in the usual sense, and *does not provide isolation from the AC line!* In other words, the variac and the isolation transformer should be used together. Plug the iso transformer into the variac; plug the set under test into the iso transformer, then plug the variac (set to zero for starters and shut off!) into the AC line. Set the variac at about 50 volts and turn it on. Nothing yet? Bring it up slowly in 10 volt increments. By the time you reach about 70 or 80 volts, the set under test should be responding. It may work, or it may hum, hiss, smoke, do nothing, etc. If you have any doubts, shut it down. Keep your eye on the rectifier tube. If you begin to see blue flashes, or what looks like a miniature lightning storm, shut it down. Chances are the filter capacitors in the set need replacing, or perhaps they can be "reformed." These are topics for another discussion.

GFI Outlets

Another recommended safety feature is a Ground Fault Interrupt (GFI) outlet that all your test equipment (including the variac and iso transformer) should be plugged into. These are the outlets commonly seen in bathrooms nowadays. However, you can replace any outlet in your home with one of these. Basically, the GFI outlet can detect a "fault" from either side of the AC to ground and open the circuit in well under one second, thus saving the life of another radio collector. In a sense, the GFI outlet may make the iso transformer unnecessary, although it's a good idea to have both. Also, if you don't want to fool with your house wiring than you'll definitely want the iso transformer.

Keep in mind that GFI outlets aren't foolproof. Notice that little button on them that says "test monthly?" These things *do go bad sometimes*. My house had two defective ones in the kitchen; both behaved like normal outlets and offered no GFI protection. But a properly

working GFI outlet does provide an extra layer of protection over the iso transformer alone.

The "Old Light Bulb" Trick

A final "classic" safety tip is the old light-bulb-in-series trick. If you don't have a variac and want to protect the radio you're testing (to some degree, anyway) you can connect a light bulb (usually, a 100-watter will do fine) in series with the radio you're working on. If there's a short circuit in the radio, the bulb will glow brightly. Once again this little rig can be made from a standard extension cord cut in half. Connect one lead from each end back together and insulate the connection properly. Connect the other two leads to a standard light bulb socket (like the one used in my demo). This thing doesn't even have to be mounted in a cabinet. Just plug it into your iso transformer, and plug the radio under test into the "extension cord."

Transformers are OK, but Beware...

We've mainly discussed testing AC/DC sets; but you should use the variac and iso transformer on any set you test. Here's why -- transformer-operated radios also suffer from one of the most common troubles of AC/DC sets -- bad filter capacitors. The variac will help you spot trouble quickly and greatly reduce the possibility of damaging the set's power transformer due to shorted filter capacitors.

Also, don't be lulled into a false sense of security just because a radio (or any other old piece of electronic equipment) has a power transformer. Frequently, these transformers absorb moisture, especially after sitting dormant in a damp environment for many years. Also, the fine wire within them can become overheated, lose its shellac insulation, and begin "leaking" current to the case of the transformer (and, therefore, to the chassis of the set). This means that even transformer-operated sets can develop dangerous voltages between the chassis and ground. Fortunately, this problem isn't that common, but it does occur. I recommend *carefully* measuring the voltage between the chassis and ground while the set is operating. There will be some leakage in all cases, but it's usually small enough to be considered harmless. However, if the voltage is much above, say, 50 volts, I would be concerned. What constitutes a safe level of leakage (and how to test it) is a good topic for a future meeting; any ideas would be appreciated. I have an old Heathkit power supply which measures about 250V between the chassis and ground (ouch!). If you encounter something like this, carefully unplug the thing

TROUBLESHOOTING SAFETY

(continued from preceding page)

and start looking for a new transformer.

Summary

Here's the hole thing in a nutshell, plus a few more ideas thrown in:

- Many old radios are deceptively dangerous to work on. Avoid water pipes, radiators, damp floors, etc. while servicing them.
- An iso transformer will provide isolation from the AC line, thus eliminating the shock hazard described above. But it won't save your butt if you're careless working inside a hot chassis - use the old radioman's trick and keep one hand behind your back when poking around inside a live chassis.
- A variac will allow you to slowly bring the voltage up on the radio you're testing. This is much safer than just plugging it in, and will hopefully allow you to spot serious troubles quickly.
- Variacs and iso transformers are still made, but they're very expensive when bought new. Check out radio meets, hamfests, garage (garbage?) sales, and regular flea markets. Variacs are actually easier to find than iso transformers, but that's OK - you can build your own iso transformer. You can also build a "solid-state variac" (sort of like a common light dimmer), but I don't think it's worth the trouble.
- As a last resort, you can wire a light bulb in series with the radio; this at least tells you if something is seriously wrong with the set. However, it doesn't protect the set entirely. I recommend the variac.
- Consider plugging everything into a GFI outlet for added safety. They're less than \$10 and well worth it. But test them regularly, 'cause they can go bad.
- All your test equipment and the radio(s) under test, should be connected to an outlet strip, which is in turn plugged into the GFI outlet. This way, pulling one plug disconnects everything (including your soldering iron!).

Some Additional Tips gathered from shocking real-life experiences:

- Most octal metal tubes (like 12SK7, 6V6, etc.) have pin 1 connected to the metal shell. If pin 1 on the socket is used as a "tie point" for the B+ voltage, the metal shell is "hot" with respect to the chassis. Touch the tube and the chassis simultaneously, and you're in for a nasty shock. (Not likely, but possible; I learned this lesson the hard way on a piece of home-built equipment.) Socket pin 1 should be grounded on these tubes, and not used for anything else.
- Some IF trimmer adjustments (those screws on top of the IF "can" transformers) are also "hot". Be careful when making adjustments; don't use a screwdriver, use a plastic tool instead. Don't believe this? I once got nasty sting from an old Hammarlund Super Pro communications receiver; further testing revealed that at least half of the trimmer adjustments were hot. Also saw this problem on an Airline bakelite set. This isn't real common, but beware.

MEETING REVIEW: APRIL

(Continued from Page 12)

a label, usually on the inside of the lid." According to Mark, the labels usually read "Armstrong's patent, October 1913, 1914." and every licensed regenerative receiver manufactured, even into the early 1920s, contained a notice that it was "Manufactured under Armstrong's patents".

Once TRF circuits became popular, regenerative receivers waned in popularity. Although not as sensitive, TRF sets, particularly those containing the popular "Neutrodyne" circuit, were relatively free from the squeals and drifting that plagued regenerative radio reception.

Mark has over fifty regenerative receivers in his collection. They all work and he's played every one of them. In his opinion, the best performer of the lot is a Kennedy 15, a five tube receiver which is so sensitive that it receives well even without the "required" antenna and ground!

POSTER'S NEWEST PRICE GUIDE NOW AVAILABLE

Poster's Radio & Television Price Guide, 1920-1990, Second Edition by Harry Poster.

This second edition of Harry Poster's reputable book on collectible radios and televisions is for the die-hard collector. Packed with information, this book offers hundreds of listings to help individuals collect, identify, and assess.

Mr. Poster's careful research covers all the major manufacturers of tube radios, transistor radios, and vintage televisions, from the do-it-yourself kits of the 1920s to the novelty sets of the 1990s.

Hundreds of radios and televisions are shown in black-and-white photos and illustrations. The information is arranged sensibly, with separate chapters devoted to tube radios, transistor radios, and vintage televisions. Within each chapter is a brief history and a comprehensive listing, arranged alphabetically. Each listing includes a brief description, composition, production year (when possible), and estimated value.

Sprinkled throughout the listings are black-and-white reproductions of actual advertisements. Collectors will appreciate the eight pages of color which feature radios and televisions from various manufacturers.

A special appendix of collector's clubs and organizations will help eager collectors keep in contact with one another.

About the Author: Harry Poster is a member of the Antique Wireless Association, the New Jersey Antique Radio Club, and several other radio and TV groups. He operates his mail-order business from South Hackensack, New Jersey and has sold sets to be used as props for movies such as *Avalon* and *Last Exit to Brooklyn*, as well as to the MTV and Nickelodeon networks. Mr. Poster has written articles for *The Antique Trader Weekly* and *Antique Week*.

Poster's Radio & Television Price Guide, 1920-1990, Second Edition is published by Wallace-Homestead Book Company, an imprint of Chilton Book Company, and is available in antiques shops and book stores. The book is priced at \$17.95 in Paperback.

BOOK REVIEW

by Dave Sica

Poster's Radio & Television Price Guide, 1920-1990, Second Edition

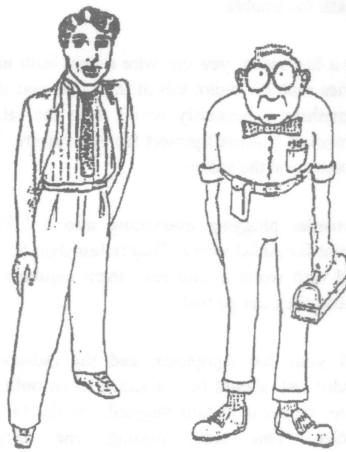
Harry Poster's newest book "Poster's Radio & Television Price Guide, 1920-1990, Second Edition" is now available. This greatly revised and expanded version builds on Harry's significant earlier efforts.

Television collectors, long minor players in the antique radio arena, were at one time hard pressed to find comprehensive information on this particular niche of the antique radio collecting hobby. Harry Poster is one of the few to aggressively address this subject. Poster's original, slim volume, while not all-inclusive, was packed with a wealth of reference information and a credible price guide.

With the current edition, Harry has gone pleasantly mainstream, including collectible radios, both tube type and transistor, along with televisions. The book may have been expanded to enhance its marketability to antique dealers and collectors in general. Although there are already quite a few price guides for antique radios, none contains a complete listing of all the possible collectible sets, so the arrival of one more book containing new information is always a welcome addition to the field. And Poster's

efforts in compiling a price guide for collectible televisions continue to be unique within the hobby.

Poster's Radio & Television Price Guide, 1920-1990, Second Edition is available to NJARC members for the special price of \$15.00. Inquire at club meetings.



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		TOTAL: 133 MEMBERS

TOURING THE MITTELMAN COLLECTION

Following the April meeting, club members were invited to an open house at Mark and Sue Mittleman's house. Mark's extensive collection of 1920s era battery sets, horns and other radio collectibles were on display, with operating sets playing in the living room.

Mark took an enthusiastic crowd of mostly incredulous collectors on a tour of his collection, which was to put it mildly, impressive.

Row upon row of radios literally filled an entire room in the Mittleman residence, stacked in many places two deep on floor-to-ceiling shelves, with other sets on display in the hallway, living room and dining room.

Mark specializes in 1920s radios and related items such as horns and he has certainly assembled as comprehensive collection imaginable. To top it all off, every radio on display has been fully restored, both electrically and cosmetically and looks and plays as it did when it was new.

Mark and Sue's generous hospitality made everyone feel welcome and in no hurry to leave. Indeed, it would have taken days just to examine all the sets on display. But eventually everyone did depart, many with good-natured, but envious backward glance as they left for home to contemplate their own collections.

NJARC NEWS ADVERTISING POLICIES

CLASSIFIED ADVERTISING

Free classified advertisements are accepted for publication in NJARC News. Classified ads for antique radios and related items are accepted from club members and non-members. Ads will be published at the discretion of the editor. Ads are normally run in two consecutive issues, as space allows. When submitting ads, please indicate if your ad is for one or two insertions.

DISPLAY ADVERTISING

Paid display advertising is being accepted for publication beginning with the Spring 1994 issue. The following display advertising rates have been established:

Full Page:	4-1/2" x 7-1/2"	\$50
Half Page:	4-1/2" x 3-3/4"	\$30
Quarter Page:	4-1/2" x 1-7/8"	\$20
Business Card:	2-1/4" x 1-1/4"	\$05

Ads should be submitted "camera ready" in the above sizes.

Camera-ready art in other sizes is accepted, subject to an additional charge for re-sizing. If you prefer, we can design and typeset your ad for a small, one-time charge.

RADIOACTIVITY '94

Mid-Atlantic Antique Radio Club (MAARC) holds the annual
MAARCFEST -Friday & Saturday, June 17-18, 1994
Holiday Inn - Timonium, MD at Exit 3 of Interstate 83, just off I-695

FRIDAY

6:00AM-6:00PM	All-day Trade's Market
9:00AM-12:00PM	Old Equipment contest Entries Accepted
9:00AM-4:00PM	All-day Round-Robin Radio Cabinet Restoration Clinic
10:00AM-11:00AM	Seminar: <u>Dr. Harold Cones</u> , "The Story of the Zenith <i>Transoceanic</i> Portables".
1:00PM-2:00PM	Seminar: <u>Kent King</u> , "E.H. Scott, His Company, and His Radio Masterpieces"
3:00PM-4:00PM	Seminar: <u>Dr. Riccardo Kron</u> , "Remanufacturing Vintage Tubes"
6:00PM-9:00PM	Banquet and Awards Ceremonies, Radio Personalities as Guest Speakers
9:30PM-10:30PM	Old Equipment Contest Evening Guided Tour

SATURDAY

6:00AM-3:00PM	Trade's Market
8:00AM-12:00PM	Seminar/Clinic: <u>Ed Lyon</u> and <u>Larry Williams</u> , "Radio Circuit Repair Techniques"
10:00AM-11:00AM	Seminar: <u>Sam Cannan</u> , "Tough Problems In Radio Repair".
11:00AM-12:00PM	Seminar: "Practical Cone Speaker Repair/Reconing"
12:30PM	Grand Auction, Col. Brian Belanger

Registration: \$4.00 by mail by 5/27/94, \$5.00 after. Trader's Market Selling: \$3.00 per space, 5 spaces max. Banquet: \$22.00 per person. Auction Selling Commission: 10% of sell price, min. \$1.00. INFORMATION: Sam Cannan, (MAARC), 1010 Siske Road, Baltimore, MD 21226

UNCLASSIFIED ADS

WANTED: Atwater Kent 8 inch electrodynamic speaker (as used in most 1931-36 models). Crosley tuning dials (2) for battery set (ca. 1923). George Shields 908.422-1652

FOR SALE: Riders Manuals: Volumes 1-17. Prices range from \$12.50 to \$85.00 per volume. LSASE for price list. Sam Faust, P.O. Box 94, Changewater, NJ 07831.

FOR SALE: Sam's schematics, volumes 1-800. Rider's volumes 1-13. Over 600 TV and radio tubes. Best offer. Jeff McDaniel 571-6183, after 3 PM.

WANTED: Anybody that would like to ride together from the Paterson-Wayne-Hawthorne area to club meetings, please contact Bob Hamilton, (201) 595-5395.

WANTED: Brite Star or Speed 210s and 250s with meshed plates; RCA 801s with ceramic base; Triode amps: Summit RA15, MP15, Bogen H010; Peerless A100A. Have lots to trade or S. Larry Rubins (609) 426-9744 before 10 PM.

WANTED: Your story. Write about your specialty or your experiences for NJARC News. Overworked, underpaid editor will happily clean up your rough notes if needed.

WANTED: Need the following W.E. tubes:

101D/F, 104D, 205D/F, 2S2A, 274A/B, 275A, 300a/B, 250B, VT-25, VT-52. Call for quote, cash ready. Richard Brill, P.O. Box 5361, Old Bridge, NJ 0887. Tel: 908.679-8026 Fax: 908.679-8524.

FOR SALE: Riders Vol. 1-14, Riders 1931, Sams Vols. 1-809. Over 1000 TV & radio tubes. B/op Sold only as one. After 4 pm. 908.571-6183. Jeffrey R. McDaniel, 569 Winter Street, Long Branch NJ 07740

WANTED: TV's and television-related books, advertising, accessories. Predicta parts, especially CRT shroud back cover. Dave Sica, 1459 St. Georges Ave., Rahway, NJ 07065. 908.382-0618

WANTED: Cable-operated car radios, tubed car radios, parts and literature. Any old auto radio-related items - car speakers, antennas, antenna kit boxes, etc. Bryan Hodgson, 14 Evergreen Drive, Voorhees, NJ 07043. Tel: (H) (609) 424-0312, (W) (609) 722-2886.

WANTED: Old, Old, Old (!!!) test equipment. Circa 1930's, preferably by RCA. RCA test equipment from the '50's and '60's. (Blue cabinet/blue knobs) RCA memorabilia. Will pick up at monthly meeting. Bryan Hodgson, 14 Evergreen Drive, Voorhees, NJ 07043. Tel: (H) (609) 424-0312, (W) (609) 722-2886.



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