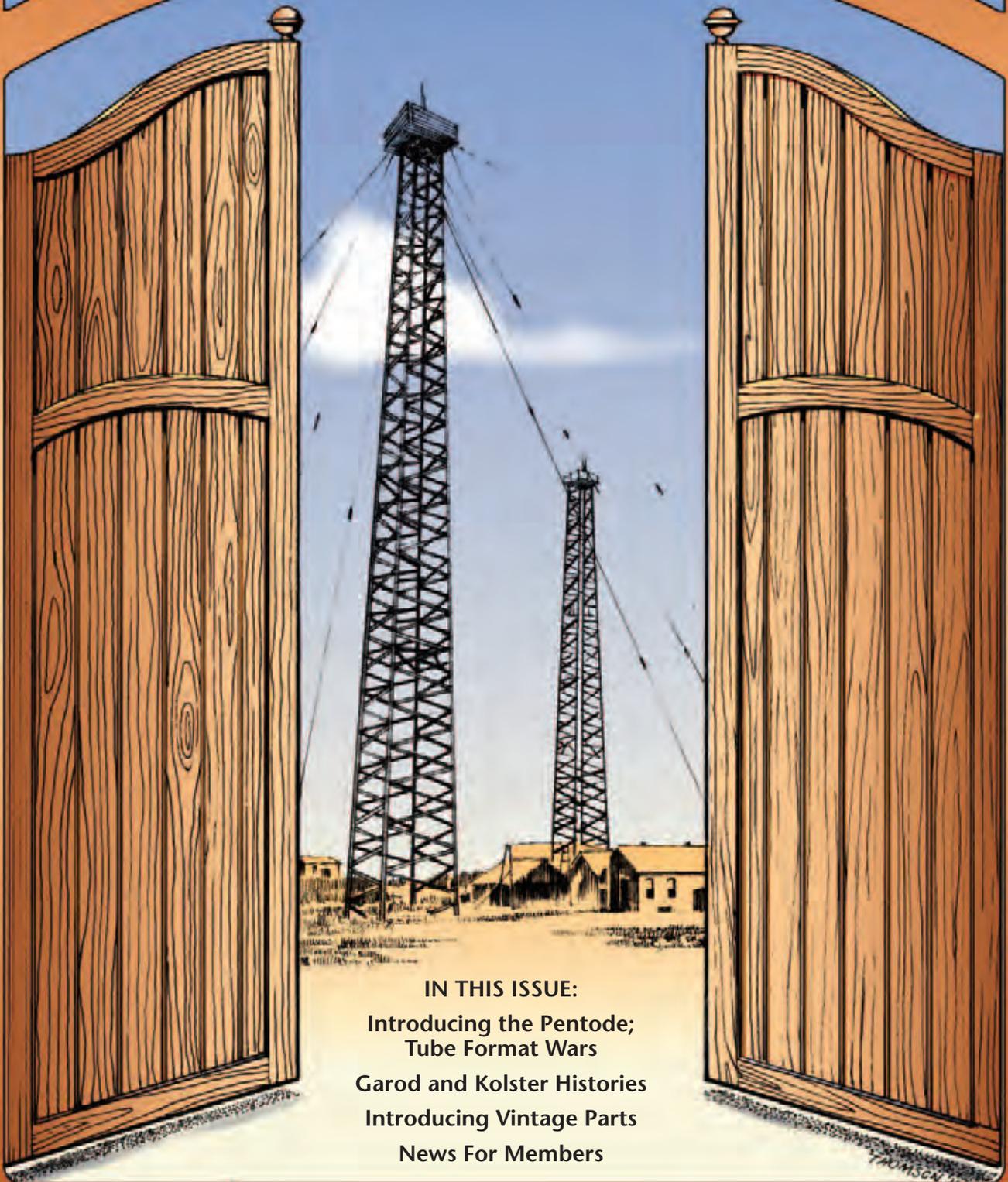


# THE A.W.A. GATEWAY

Volume 1, Number 3, September 2011



**IN THIS ISSUE:**

- Introducing the Pentode;  
Tube Format Wars**
- Garod and Kolster Histories**
- Introducing Vintage Parts**
- News For Members**

*Your Entry to the Fascinating World of Vintage Communications*



The *AWA Gateway* is an electronic publication of The Antique Wireless Association, downloadable without charge from the AWA website [www.antiquewireless.org](http://www.antiquewireless.org), to stimulate interest in vintage communications history, equipment restoration and collecting.

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#### ABOUT OUR COVER

The scene that is partially revealed behind the gateway is the Marconi transmitter complex at Poldhu, southwest Cornwall, England, that sent the first transatlantic radio signal. The three dots, representing the Morse letter "s," were received by Marconi at St. John's-Newfoundland on December 12, 1901. Shown are two of the four sturdy towers that replaced the two antenna masts used in the original test.

The *AWA Gateway* cover was created by Will Thomson of Armadillo Arts, Iowa City, Iowa.

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## From The Editor

Welcome to the third issue of *The AWA Gateway*! If, somehow, this is the first *Gateway* that you've come across, you'll find all three issues available for free download on the Antique Wireless Association web site at [www.antiquewireless.org](http://www.antiquewireless.org).

The *AWA Gateway* has been specifically designed to inform and encourage those who would like to know more about researching and restoring vintage communications equipment and systems. Taken together, our issues will form a tutorial covering many aspects of this field. But, more importantly, we hope that they will stimulate you to delve further and find out where your own particular interests lie.

Those who find themselves drawn more deeply into this fascinating world may wish to join The Antique Wireless Association and begin receiving our quarterly *AWA Journal* and yearly *AWA Review*—publications that are chock full of more advanced information about various aspects of our hobby. For more information about AWA, look at "About the Antique Wireless Association" elsewhere in this issue. Also please browse our website, which includes information about how to become a member.

Right now, most of the material in *Gateway* is originated at AWA. But we would like, little by little, to make it—like our two sister publications—a venue for reader contributions of all kinds. Reader Don Ignatius has responded to our call for contributions by sending a short article, which appears in this issue, about how his interest in antique radio got started. Similar articles from other readers would be very welcome!

Anyone interested in discussing possible contributions to *The AWA Gateway* should contact me at [mfellis@alum.mit.edu](mailto:mfellis@alum.mit.edu) or tweet us at @AWAGateway. In the meantime, please enjoy Issue No. 3! — Marc Ellis, N9EWJ

## From The Deputy Director

If you were to ask a group of collectors "Why do you do it?" the answers would be as varied as the scope and

list of items in their collections. For example, because I enjoy using the older ham radio equipment on the air, my modest collection (my wife Bonnie says I am not a collector, but an accumulator) is centered on vacuum tube amateur radio gear. I usually refer to it as "hollow-state gear."

The motives of collectors clearly vary. Some understand the historical significance of the items they collect and seek to preserve that segment of history. Some enjoy the challenge and the hunt for artifacts and related history. Then there are those who collect just because they like to look at the items.

Among the historians are those who. . .

- collect to preserve historical items and to document their history.
- are general historians or topic specific historians.
- are authors whose collection is the basis for documenting and preserving the history of artifacts and technologies to share with others.
- are book collectors.
- are equipment collectors.
- are paper/document collectors

These are just a few of the many possible categories. I could go on, but I think you get the point.

So, why does a museum such as the AWA develop collections of artifacts? The AWA's role is stated in our Vision Statement:

"To preserve and share the history of technology used to communicate and entertain from the first telegram to today's wireless text messaging."

The AWA has been fortunate to receive some significant artifacts directly from original sources. These include Howard Armstrong's regenerative receiver, his superhetrodyne amplifier, and his FM demonstration amplifier—all received from his faithful associate Harry Houck. But, for

the vast majority of items, the AWA collection is based on the generous donations of members and collectors through the years.

The AWA's significant challenge is to mold and document its collection into a cohesive museum and research center that will appeal to and inform the general public, engage and excite the younger generation, and make the artifacts and associated stories available to members, historians, researchers, and other museums.

Our vision starts with the visions of the collectors who have made donations: their foresight, their commitment to preserving history, their ingenuity, dedication, and perseverance in collecting, and their generosity in gifting to the AWA. The AWA is committed to continuing the life work and of these dedicated people.

Bob Hobday

Deputy Director, Antique Wireless Association



*A few of the items in my collection of "hollow state" ham gear. Bob Hobday photo.*

## From the Membership Services Committee Chairperson

### E-MAIL UPDATES

By now many of you are looking back on the exciting and productive time you spent at the 2011 AWA convention. If you have provided your current e-mail address to Ed Gable, you should have received an e-mail notice with convention information in addition to the information and registration material included in the July *AWA Journal*. We plan on routinely notifying members by e-mail of new time-dependent information. (Each e-mail notice saves approximately \$1,500 over using US mail.) To update your AWA e-mail information, contact Ed Gable using the following special address: [AWAProfileInput@gmail.com](mailto:AWAProfileInput@gmail.com)

### CONVENTION WEBSITE

Many of you have also taken advantage of the opportunity to receive advance convention information and even register on line through the Convention website: <http://awaconference.org>

This site will be open and ready to serve you again for the AWA 2012 convention.

### "MEMBERS ONLY" WEBSITE

A major project briefed to the AWA Board of Directors as part of the 2011 Budget is an initiative to create an "AWA Members Only" website. The goal is to allow anyone to join, renew membership or update their membership information using the internet and a secure website. Another major goal is to allow members to have privileged access to unique content for such items as Museum artifact information and documents.



*This display of documented tube sockets was entered in the Old Equipment Contest. Richard Neidich Photo*

We hope to have this site operational in the next year. The goal is not to eliminate our current capabilities, but to expand them to include additional self-service opportunities. Any ideas you have for further expansion of this site

should be forwarded to the Committee Chairman, Richard Neidich: [RGNeidich@aol.com](mailto:RGNeidich@aol.com).

### AWA "GATEWAY" IS YOURS!

You are now reading the third issue of the *AWA Gateway*. This publication has been designed to provide members and non-members with content of a more basic nature than *The AWA Journal*. Additionally, it provides a vehicle for individuals to provide signed articles about their interests in communications and technology. Its format is what it needs to be, not nearly as structured as the *Journal*.

Therefore, send along your ideas, inputs and communications stories to *Journal* Editor Marc Ellis at: [mfellis@alum.mit.edu](mailto:mfellis@alum.mit.edu)

We have the luxury of using color at no cost, so picture stories are very acceptable. Naturally, AWA reserves full editorial control as to the appropriateness of any material.

Richard Neidich  
Chairman, Membership Services Committee



A group of lots laid out for inspection the night before the AWA Convention auction. Richard Neidich Photo.

## READER STORIES: DON IGNATIUS

*We have been encouraging Gateway readers to send in short articles describing how they became interested in radio collecting and/or restoration. Don Ignatius was the first to respond and his story is below. We will publish more reader's stories as we receive them, and we'd like to hear from as many people as possible!*

As a kid I had no interest in electronics or radio except to listen to the many programs that were on the air at that time (1940s and 1950s). Later, as a young man, I met a ham who was a neighbor of my in-laws'. He was also into CB, which at that time more closely regulated than today. The FCC issued formal licenses and call letters, though applicants did not have to pass tests of electronic knowledge. I soon developed an interest in this.

Having limited means, I couldn't afford a manufactured CB set. But at that time there were quite a few kits available, and I managed to scrape up enough money to buy a couple of Knight kit C-10s. After building them, I was hooked on electronics and just had to know more. Back then, many correspondence courses in electronics were being offered, and I took one from Coyne.

After a brief period of poking around with television sets, I began working with car radios. I was a parts manager for a car dealer, and started repairing radios for them. Eventually I was noticed by other car dealers and began expanding my repair activities. Not many professional shops were repairing auto radios because there was no real money in it, but it was a boon for me!

Next I started repairing AC radios for friends and others and also began repairing 8-track tape players for a local electronics store. Again, this was an area that professional shops avoided because 8-tracks were so cheap there was no money in their repair.

To make a long story short, this activity got to be too much like work and not very much fun anymore. After

doing my day job, I would sometimes have to work in my home shop until 1 or 2 a.m. because people didn't want to be without their units any longer than they had to. Then I happened to run across an article in the newspaper about a professional shop in California that had converted to vintage radio repair because there was less time pressure on job completion.

I put that idea into practice, and after working with those great old radios the collecting bug bit me and the rest is history. Like many of us I first developed an interest in cathedral sets. One of my fondest memories was of my dad coming home for lunch and listening to Walter Winchell's news broadcast on a cathedral.

As time went on I began really to enjoy the 1920s battery sets. As these units got scarcer and more expensive I moved on to later wood and plastic table models and also acquired just a few consoles. Then came transistors and novelties. My interests have now become quite varied and I am open to almost any set that catches my eye, budget permitting.



Here's part of Don's extensive collection. For more, visit his website at [www.home.earthlink.net/~dmign/index.htm](http://www.home.earthlink.net/~dmign/index.htm)

# The Receiving Tube Story

## Part 3: The Power of the Pentode; The Format Wars

### PENTODE TUBES

The last installment of “The Receiving Tube Story” dealt with the development of the screen-grid tube. As you’ll recall, this four-element (tetrode) design permitted a much higher degree of radio frequency amplification than did the triode (3-element) tube. Its extra grid, placed between the control grid and the plate and maintained at a positive potential, helped isolate the grid and plate circuits of the tube from each other, minimizing feedback and instability.

The screen-grid design was a remarkable breakthrough in vacuum tube technology, significantly improving the performance of the TRF receivers then in common use. However, there was a catch. The negatively-charged electron stream emitted by the cathode, accelerated to even higher velocity by the attraction of the positively-charged screen grid, impacted strongly on the plate. This knocked loose additional electrons from the surface of the plate (a phenomenon known as “secondary emission”).

Many of these electrons were attracted to the screen grid, which reduced the current (electron flow) in the plate circuit, limiting the amplification that could be achieved. Secondary emission is also responsible for introducing nonlinearity into the plate voltage vs plate current curve of the tube (see graph). In fact, the plate current actually begins to decrease with increasing plate voltage in the region where the plate and screen voltages are similar—causing a pronounced dip in the curve. That phenomenon introduced distortion that made the tetrode unsuitable for use as a power amplifier (audio output) tube.

The pentode (five-element) tube was developed to

overcome this deficiency. Born in the research laboratories of the Holland-based Phillips Company, the concept behind the pentode tube is elegant in its simplicity.

An additional grid, known as the suppressor grid, is located between the screen grid and the plate and connected (usually internally) to the cathode or filament. Since the suppressor grid is at the same potential as the cathode, it has no effect on the electrons emitted by the cathode, neither impeding nor accelerating them on their journey to the plate.

However, by virtue of being connected to the cathode, the suppressor grid is negative with respect to the plate. Because of that, it repels the electrons knocked out of the plate—sending them back towards that element, where they are re-attracted and become part of the plate current. The result: improvement in linearity and significant gains in efficiency and power handling capability.

### THE EARLIEST PENTODES

The first power pentode type generally available in this country was the type 33 which, like the pioneering type 22 tetrode (see the previous installment of this story), was a battery tube released at the dawn of the AC tube revolution. Like the 22, this tube saw very little use and is on the rare side. If you have any in your collection, don’t let them go!

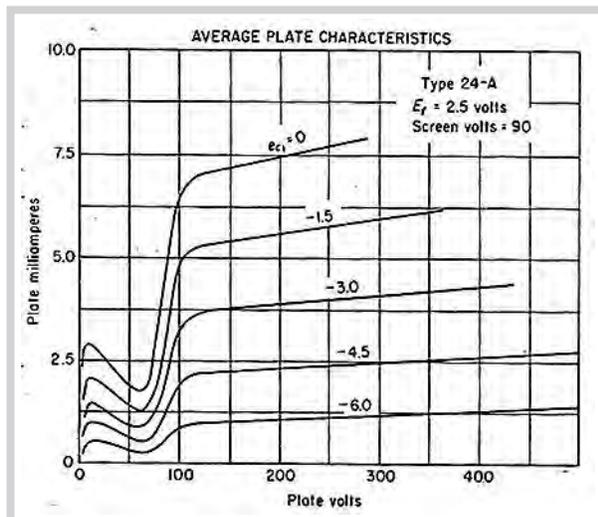
Following the 22 was the type 47 (released in 1931), which did see wide usage. The 47 was a directly heated (no cathode) tube with the 2.5-volt filament that had become standard for tubes operating on AC power. Like the 71A (see previous installment), which was actually a battery tube, its lack of a cathode did not prevent it from operating as a hum-free power amplifier when lit from an AC source.

In his *Radio Physics Course* (second edition, 1933), Alfred Ghirardi provides an insight into the quantum performance leap made possible by the introduction of the pentode as a power amplifier. He reports that the type 45 triode, then in wide use as a power amplifier, consumed 8 watts of power in its plate circuit while delivering 1.6 watts to a speaker with a 50-volt signal applied to its grid. The type 47 power pentode drew about 10 watts in its plate circuit, but delivered 2.5 watts of undistorted power to a speaker with a signal voltage of only 16.5 volts applied to its grid.

The net result: the type 47 provided almost as much power as two push-pull 45s (a common configuration). And since the 47 required only about one-third of the signal input voltage as the 45, the “first audio” stage required in front of the 45s could be eliminated along with its contribution to hum and distortion.

### TYPES AND FUNCTIONS MULTIPLY.

In 1931, soon after the release of the 47, the first indirectly-heated power pentode appeared. The type 38 was



*Dip in tetrode’s plate current vs. plate voltage curves (shown here for type 24-A) made the tube unsatisfactory as an audio power amplifier.*



shells of these new tubes were made of metal instead of glass. They were much more compact than previous American designs and sported a brand-new eight-prong base (dubbed the “octal” base) equipped with a clever locating key molded onto a center post.

Some of the nine tubes that were released by RCA (and later by various independent manufacturers), were simply metal versions of existing glass tubes. Others, such as the 6H6 dual triode and 6L7 mixer-amplifier, were brand-new types.

Generally speaking, these tubes did not advance the state of the art in receiver performance, but they did offer some handy features. Because of their metal shells, the new tubes did not require the use of separate metal shields. And the octal base, which could be installed in its socket with a “rotate-until-it-drops” action, was a real advance in tube changing convenience. Ask anyone who has ever installed one of the previous, non-keyed, tubes into a tight spot at the back of a chassis!

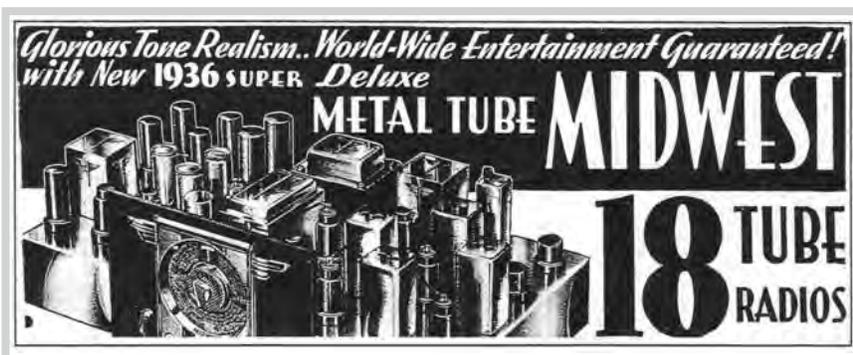


*Left: The “GT”-style glass tubes had tubular envelopes; were much more compact than their “G” equivalents. Right: The Loktal tube, originated by Sylvania, had a unique locking groove on its locating pin.*

A few years later, RCA pioneered a new manufacturing concept in its line of metal tubes: the “single-ended” design. Several types originally manufactured with a grid-cap connection, including the 6L7, 6K7 and 6Q7, were re-released without the caps, all leads being brought out to the octal base. This reduced hum and unwanted coupling effects, improving efficiency and performance. The new tubes were identified with an “S” (for “single ended”) inserted into their type numbers (6SL7, 6SK7, 6SQ7, etc.).

### OCTAL-BASED GLASS TUBES.

The GE/RCA advertising campaigns for metal-tube-equipped sets tended to put down competitive radios with ordinary tubes. Incensed, Philco refused to have anything to do with the metal tubes—developing, instead, a new line of glass tubes having octal bases. The glass envelopes of these tubes were of the familiar “double-dome”



*As soon as metal tubes were released in 1935, radio manufacturers raced to put them in their sets and hype them in the media.*

or “ST” design introduced a few years previously to replace the old “pear shaped” style.

The coming of the glass-octal, or “G,” tubes (which began to be released just a few months after the introduction of metal tubes) caused a proliferation of “the same but different” types. The first glass-octals to be released were either glass versions of the metal tubes or glass/octal versions of older glass types with traditional bases.

The former carried the same type designation as the metal version with a G suffix to indicate “glass.” The latter, of course, were not interchangeable with their parent types because of the basing differences. These required new designations (for example, the octal-based version of the 6D6 was designated 6U7G). Later, of course, completely new types of glass-octal tubes were released.

### GT AND LOKTAL TUBES.

The vacuum tube envelope went through still another evolution when Hytron announced the “Bantam” or “GT” type tube in 1938. The “GT” tube was a shortened and much more compact version of the “G” tube. It was housed in a tubular (hence the “T” in “GT”) envelope instead of the old “double-dome” style. Not much larger than the equivalent metal tube, a “GT” type could easily substitute for it even where space was very limited.

This led to a very confusing and redundant situation in which the same tube could be available in three different styles: metal, G and GT. Eventually, however, the GT design prevailed. While “GT” tubes offered no improvement in performance, set manufacturers favored them over “G” tubes because of their compactness. And for some reason, despite the initial acceptance of metal tubes, glass types came to be preferred in the industry.

Approximately concurrent with the first release of “GT” tubes was the introduction of the “Loktal,” a new Philco-sponsored threat to the metal tube. Though equipped with a nominal metal shell at the base, Loktals were true all-glass tubes. Instead of being wired into separate base pins, the wires passing through the bottom of the tube were made extra-heavy, to be directly plugged into the tube socket.

Originally manufactured by Sylvania, later by others, the Loktal tubes had a central keyed post somewhat like that used in the octal base. However, the end of the post carried a groove that was engaged by a locking spring built into the tube socket. This arrangement helped lock the tube into its socket; hence the name “Loktal.”

Since few set owners that I'm aware of were troubled by tubes creeping out of their sockets—even in auto sets—this Loktal feature had to be of value mostly as a marketing gimmick. In any case, the new tubes were used extensively in Philco radios as soon as they became available.

In order for Loktal tubes to be identified as such by their type designations, a variance was made in the initial numeral of the standard tube designation. Normally "6" for 6-volt tubes and "12" for 12-volt tubes, the numeral became 7 and 14, respectively, for 6- and 12-volt Loktals.

### MINIATURE TUBES.

The all-glass design of the Loktal base paved the way for the introduction of miniature tubes about 1940. The new tubes were tubular, with tip seal, about 3/4" in diameter and 2" long. And—as with the Loktals—the wires passing through the tube base were also the contact pins. There was no metal shell on this tube type, nor was there a locating key. Correct insertion was assured by an asymmetrical arrangement of the seven pins.

The tubes released in 1940 were 1.4-volt filament types for battery portables: the 1R5, 1S5, 1T4 and 3S4. Later, during the war, many cathode-equipped AC types (such as the 6C4 and 6J6) were introduced.

These, of course found their way into broadcast receivers during the postwar period. Also available immedi-



*The original miniature tubes, designed for use in battery portables, had 1.4-volt filaments. This is the 1R5 pentagrid converter.*

ately after the war was a range of miniature types designed for the AC-DC sets we know as "baby boomer" radios. These tubes included the 12BA6, 12BE6, 12AT6, 50B5 and 35W4. There were also 6-volt equivalents of most of these tubes for use in straight AC radios.

## READER INTERNET SITES

In the April issue of *The AWA Journal*, we mentioned an idea proposed by reader Steven Johannessen. He felt that *Gateway* readers might find it interesting and stimulating to look at collections our readers might have posted on line. We agreed and solicited URLs. We received and included three of them last time. Here they are again along with some additions received since then. Four readers have responded so far. Additions to the list are always welcome!

Allie Lingo (radiodoc@windstream.net) sent two:

**Radios:** <http://www.radioatticarchives.com/contributor.htm?code=499>

**Test Equipment:** <http://www.oldtestequipmentarchives.com/contributor.htm?code=26>

Mike Adams (mike.adams@sjsu.edu) has recently redesigned his Lee de Forest website. Look it over at [www.leedeforest.org](http://www.leedeforest.org).

Ron Lawrence sent several URLs featuring his collections and interests:

Radio Heaven Page  
<http://radioheaven.homestead.com/menu.htm>

Clough-Brengle test equipment page  
<http://cloughbrengle.homestead.com/>

Civilian Conservation Corp. page  
<http://radioheaven.homestead.com/CCCradio.html>

Ron's YouTube channel—with video tours of his collections  
<http://www.youtube.com/user/w4ron>

The Tube Collector's Association Tube Photo Gallery  
<http://radioheaven.homestead.com/TCA.html>

Don Ignatius Collection  
[www.home.earthlink.net/~dmign/index.htm](http://www.home.earthlink.net/~dmign/index.htm)

# Company Chronicles

*See copyright statement at end of article.*

The Garod brand name had its origins in 1921 when Laurence Gardner, who had been in the jewelry business, and Isaac P. Rodman, an electrical engineer and a former associate of Edison's, joined forces to enter the radio business. The Gardner-Rodman Corporation's first product was the Heliphone, a \$5.00 crystal set using a cleverly-designed helical coil. The set sold well, but by the following year the crystal set boom had passed its peak. In addition, the Wireless Specialty Apparatus Company was driving crystal set manufacturers out of business with threats of patent infringement lawsuits.



Gardner and Rodman now joined the Independent Radio Manufacturers, a group put together by Freed-Eisemann to fight WSA. Like Freed-Eisemann they also went into the manufacture of tube radios utilizing the Neutrodyne circuit developed by Hazeltine. Reorganizing their business under the name "Garod Corporation" in 1923, the organization began selling Garod brand Neutrodyne sets. Unlike Freed-Eisemann, Garod did not manufacture its own parts but purchased most, if not all, of them from other manufacturers.

At first Garod did well, paying Hazeltine royalties on sales of \$350,564 in 1923 and reporting a pre-tax profit of \$85,323 in 1924. Sales declined, however, and in 1926 the company decided to take a flyer on a revolutionary AC-operated set designed by Benjamin Meissner, who had joined the company in March of that year. The set (Model EA) proved to be a disaster because the Dubilier capacitors used in its power pack developed a failure rate of 100%.

Though Garod sued for \$250,000 in damages, the short-term effects of this setback were devastating. At about the same time, Garod itself was being sued by RCA and GE as part of an infringement action against Hazeltine's patents. The company finally went into receivership in February, 1927.

Though the company's resources were now quite limited, Meissner proceeded with the design of an improved AC receiver (the Model EM) using a specially-built directly-heated AC tube known as the Armor AC-100. A few were made, but by August, 1927 Garod was sold for \$45,000. The new owners got the organization out of receivership but their assets, in turn, were auctioned off a few months later after Garod failed to obtain the RCA license now necessary to manufacture its designs.

The Garod brand reappeared in 1933, and sets were manufactured under that name for the next fifteen years or so. The company was then bought by Majestic, which merged with Wilcox-Gay in 1950. Garod continued to operate for a few years as a subsidiary of the new organization.

The unsuccessful Kolster company had its genesis in 1924 when Rudolph Spreckels, of the wealthy sugar refining and banking family, became chairman of the board of the Federal Telegraph Company of California. Spreckels decided to finance Federal's entry into the broadcast receiver market. But, because there was already a Federal radio brand (produced by the unrelated Federal Telephone and Telegraph Co. of Buffalo, NY), a different name had to be selected for the new products.

The brand name chosen was the surname of Frederick A. Kolster, a well-known, Swiss-born radio engineer and inventor who had been with Federal since 1921. Kolster was former chief of the radio section of the National Bureau of Standards, inventor of the Kolster decimeter wavemeter and radio compasses and a former associate of Lee de Forest's.

The new product line was inaugurated with two elaborate models produced under contract by Brandes and introduced via double-page ads in the Saturday Evening Post. But because Brandes wasn't making any money on the contract, they employed slipshod construction methods—resulting in 60 percent of the sets being returned by the distributors. These problems were resolved a few months later when Brandes was absorbed into Federal to form Federal-Brandes Incorporated—but not before the company had lost upwards of \$800,000.

## KOLSTER

Because of the failure of the pricey seven- and eight-tube models, a more competitive six-tube model was produced for the following (1926-27) season. But even this did not enjoy brisk sales and Spreckels had to sink another \$750,000 of his family's money into the effort. The company also moved its offices from the Woolworth building in New York City to more Spartan quarters in Newark, New Jersey.

Kolster received an RCA license in 1927, making it possible for an a.c. model to be introduced in October of that year. Those sets didn't sell well either, however, and 1100 employees were let go the following February. That May, 10,000 obsolete models were sold to Emerson Radio and Phonograph Corp (then a dealer in surplus stocks), and by the following October it was estimated that 128,000 surplus radios remained on the factory floors.

Spreckels and other stock-holding executives began to bail out. In April, 1928, the company changed its name from Federal-Brandes to Kolster, unloading a large amount of stock in a questionable manner—for which they were sued in 1931 by a group of disgruntled stockholders. Court receivers were appointed in 1929, and Kolster's assets were auctioned in 1931. Shortly afterwards a new company, Kolster International, was formed by Mackay, but ceased production before the end of 1932. Federal-Brandes in England, also controlled by Mackay, survived and eventually became part of ITT.

*These company biographies, used with permission, were abridged from Alan Douglas's three-volume encyclopedia Radio Manufacturers of the 1920s, published by Sonoran Publishing, 6505 West Frye Rd., Suite 15, Chandler, Arizona 85226, sonoranpublishing.com, and copyrighted 1988, 1989 and 1991 by Alan Douglas.*

# Play It Again

## A No-Nonsense Guide to Vintage Radio Restoration

### PART 3—THE PARTS PROBLEM

#### COSMETIC PARTS

One of the most difficult tasks for the antique radio restorer is finding parts, especially “cosmetic” ones such as knobs, dials, dial escutcheons, and ornamental hardware. When you are considering buying an antique radio, examine it carefully for damaged or missing cosmetic parts.

Some parts are unobtainable because they were of such poor quality initially that no usable originals exist, and there is not enough demand to warrant making reproductions. An example is the acetate dial bezels on certain large RCA and GE consoles of the late 1930s. The plastic in them deteriorated over the years. Since all of these models were similarly affected, you have little chance of finding a good bezel. I don’t buy a radio unless I think I can restore it to its original appearance.

#### SCOPING OUT A SET

When I buy a radio, I assume it doesn’t play no matter what the seller says. Unless the set is plugged in and running when I first see it, I don’t let the seller power it up either. The price I’m willing to pay doesn’t depend on whether the set plays. Too many radios have been ruined by applying power before checking them out.

After noting the cosmetic aspects, inspect the chassis carefully before you buy. Is there excessive rust suggesting the set may have gotten wet? Smell it. Is there any burned odor suggesting the power transformer might be bad or any discoloration indicating it might have overheated?

Is the speaker cone mostly intact? Small holes and tears can be mended, but a replacement speaker may be hard

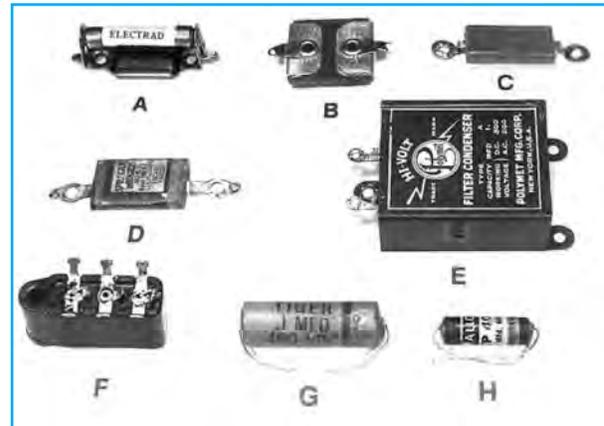


Fig. 2. Assortment of vintage capacitors.

to find. Are there empty holes in the chassis where parts are missing? All of these conditions are red flags - buy with caution if at all.

I don’t buy “orphan” radios for my collection. These are house brand sets like Truetone, Firestone and others made for large retailers by unknown manufacturers. Cosmetic parts for these sets are very hard to find. You’ll have an easier time restoring your set if you stick with the major manufacturers. Original or reproduction cosmetic parts for radios such as Philco, Zenith, Atwater Kent, etc. are much easier to find.

#### ELECTRONIC PARTS

Getting the set to play is usually easier than restoring the cabinet. Modern parts can often be substituted for unavailable antique ones. Many antique radio components have no resemblance to their modern counterparts, so I’ve provided photographs to help you recognize some of the parts commonly used in antique sets.

Figure 1 shows some resistors. A and B are glass encased grid resistors common in 1920s battery sets. C and D are pre-1930 carbon resistors with radial leads. These are not insulated.

E is the more familiar insulated carbon resistor used from the mid-1930s on. F is a flat wirewound resistor and G is a tapped, wirewound voltage divider. H is a flexible wirewound resistor. J is a tapped, wirewound resistor encased in metal for cooling and K is a fairly modern 10 watt resistor.

Figure 2 shows capacitors. A-C are mica capacitors used in detectors. A has integral clips to hold a glass grid leak as shown. D is a paper bypass capacitor and E is a large paper filter capacitor in a metal case. F is a Philco “Bakelite block” capacitor and G and H are the more familiar tubular paper capacitors.

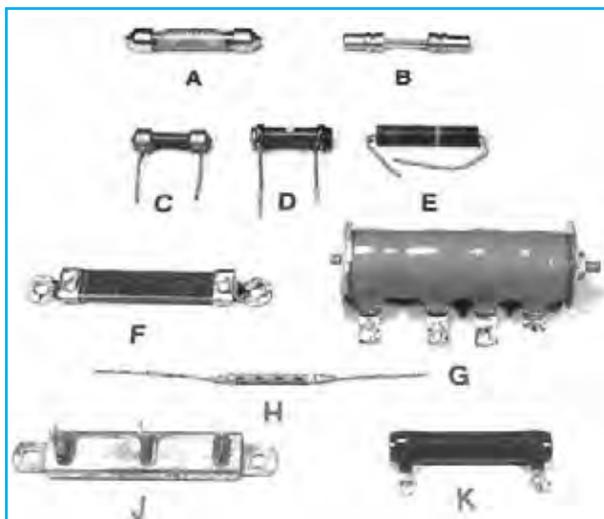


Fig. 1. Assortment of vintage resistors.

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## ABOUT THE ANTIQUE WIRELESS ASSOCIATION

**T**he Antique Wireless Association is an organization of over 2100 international members linked by a common interest in the history of electrical and electronic communications. AWA members come from all walks of life and our ranks include teenagers, octogenarians, and beyond in both directions. At one of our meets, you might find yourself shaking hands with a retired broadcast executive or military electronics specialist, an engineer in a high-tech electronics firm, or an eager young person looking for advice on restoring his or her first radio.

The organization was started in 1952 by Bruce Kelley, George Batterson, and Linc Cundall—amateur radio operators and radio collectors from upstate New York. Their initial goal was to establish a museum where they could collect and preserve early wireless and radio equipment and historical information before it was lost to future generations. Decades later, their legacy continues to motivate our members.

Some of us are most interested in the technical background behind the epoch-making discoveries that now make it as easy to communicate across the globe as around the corner. Others enjoy the romance surrounding the men and institutions that put these discoveries to work: the maritime radio operators who averted disasters with their alert ears and quick thinking; the short-wave stations that radiated glimpses of exotic cultures and mindsets; the giant radio networks that delivered unparalleled entertainment and timely news to our homes while hawking toothpaste, cigarettes and soap flakes.

Though AWA members share this common interest, which many can trace back to early childhood, they express it in different ways. Some of us collect radio-related literature and manuals. Others collect and restore hardware: Morse keys and sounders, battery radios of the 1920s, telephones, advertising signs, cathedral and console radios—you name it! Collections can become very specialized, restricted to such things as radio components crafted of shiny Bakelite and gleaming brass or perhaps the fragile and intricate vacuum tubes that made the communications miracles possible.

Among our members are meticulous craftsmen who enjoy replicating vintage receivers and/or transmitters. Those who are licensed amateurs fre-

quently operate such equipment in special communications events sponsored by the AWA.

In addition to the commitment to the preservation of historical artifacts and background materials at the Museum, AWA also publishes *The AWA Journal* and *The AWA Review*. The *Journal* is a quarterly publication that gives our multi-talented members an outlet to share their historical research, equipment restorations, troubleshooting and servicing tips and other information of common interest. *The AWA Review*, which also publishes member contributions, contains more extensive and scholarly papers. It is published once a year.

*The AWA Gateway* is the latest addition to the AWA family of publications. It's delivered electronically and free of charge—downloadable from our web site [www.antiquewireless.org](http://www.antiquewireless.org).

Our content is targeted at those who may not be familiar with the AWA and who perhaps are just becoming interested in the history, collecting or restoration of vintage communications gear. For that reason, our technical articles are more basic than those in our other publication and our articles about AWA generally do not assume knowledge that that only those familiar with our organization might have.

The AWA also sponsors a four day annual convention in August featuring technical presentations and forums, a large auction, an awards banquet, an equipment and artifact competition, a book sale, and an active flea market. The convention affords attendees plenty of time to renew and make friendships, time to engage in long conversations on collection, preservation and all other aspects of the hobby.

The AWA is chartered as a non-profit organization in New York State, an IRS 501(c)(3) tax-exempt corporation, and is a member of the American Association of Museums. To learn more about AWA or to join our organization, visit the AWA website at [www.antiquewireless.org](http://www.antiquewireless.org).

### DONATING ARTIFACTS TO THE AWA

You may have artifacts that you are interested in donating to the AWA. We would be pleased to discuss any possible donation. Please call us at (585) 257-5119.

# Members' Corner

## News of Particular Interest to the AWA Membership

### MUSEUM NEWS

From Lynn Bisha, W2BSN, Associate Curator

In addition to the large number of donations that have been coming in, we are taking the time to wonder at some of the latest acquisitions. A beautiful Edison low-boy phonograph, a Heathkit catalog collection spanning 1949-1958 and a Siemens (made for RCA) teletype system complete with paper tape punch, tape reader and power supply. Thanks to Duncan Brown for getting this TTY set and making it work.

This is in addition to a complete ham station from the W9NLU estate and various pieces from the Don Wallace W6AM collection. One exceptional piece from W6AM is a homebrew transmitter built in 1923. It earned W6AM an award from President Herbert Hoover! The entire radio is built in a case made of solid sheet copper.

The local electrical inspector gave the new museum building a passing grade except for a contactor box that needed to be removed, so another hurdle towards occupancy has been overcome.

Our annual World Convention 50th year celebration was another crowd pleaser. Curator Bruce Roloson gave the keynote speech on what the first fifty years have been like, and offered a glimpse into the future. Included for the first time was a Museum day on Tuesday afternoon. Volunteers were at the new campus to show you what they have accomplished and to let our members see the interiors of the buildings. Wednesday thru Friday were packed with seminars, meetings and talks on wide variety of topics. Saturday featured an auction full of collector items.

On June 24th, the museum hosted the Pierce Arrow Club's annual convention. Volunteers included Bob Hobday, Joe Granica, Ron Roach, Bill Tolan, Warren Weiderman, and Lynn Bisha. For three hours on a Friday morning the club was given full access to the museum, while our volunteers took turns poring over the cars outside. The



One of the beautiful automobiles that was parked outside our museum when the Pierce Arrow Club visited.



Approximately 40 young people enjoyed a ham radio demonstration by museum volunteers at the former museum annex, now the Veterans Memorial Park Annex.

club members were very interested in all aspects of the museum and several of them were also radio collectors. This type of special event is as entertaining for the volunteers as it is for the visitors.

On Wednesday July 27th, Ron Roach W2FUI, Joe Granica WB2G and Lynn Bisha W2BSN, held a ham radio demonstration for the children in the East Bloomfield summer day program. This program is held in the old museum annex that was sold to the town last year. It is now referred to as the Veterans Memorial Park Annex.

Approximately 40 people were given a short course in International Morse code, a look inside a typical 1950s ham receiver, and a chance to talk on the air with radio amateurs. As expected, there was some shyness about talking on the air, but once the ice was broken, they had a great time. Our thanks go out to the ONTARS net (Ontario Amateur Radio Service) on 3.755 MHz and the Wednesday morning Bruce Kelley net on 3.837 MHz for helping to provide the children with a real ham radio experience.

From Ron Roach, W2FUI, Operations Manager

An electrician provided by our renovation contractor disabled the non-compliant contactor in the future museum. The building electrical system currently meets UL code. He also inspected the wiring in the loft and found no problems requiring correction until such time as the electrical system is upgraded during the building renovation.

The recent sharp increase in artifact donations and our desire to maintain a clear interior at the future museum has made it necessary for us to lease 3,300 square feet of temporary storage space in East Bloomfield. Negotiations continue for additional space, if needed.

The clean up at the future museum from the incursion of significant run-off from a heavy rain storm just days before the AWA Convention was completed in a week. The Tuesday volunteers and staff from the AWA property manager's business across the road placed lumber, steel shel-



Mopping up after the rainwater incursion.

ing, tubes and CRTs on pallets and tables to facilitate the removal of all the carpeting in the building. Base molding was removed along with several inches of drywall to hasten drying and prevent mold.

The East Bloomfield Town Board moved swiftly to begin correcting the drainage problem, its highway department modifying culverts on Gauss Road south of the campus. Dorothy Huber, town supervisor, began contacting county and state agencies responsible for correcting long standing drainage problems north of the campus.

An Atwater Kent series E speaker left at the hotel at the conclusion of the AWA Convention waits at the Media Center to be reunited with its owner.

Finally, I met one of the two men instrumental in the creation of the AWA museum when the first artifacts were moved to Bruce Kelley's carriage house in what was then Holcomb, NY. Marty Steckel, who lived in town many years ago, moving south in the 60s, visited our Museum a few weeks ago. Marty informed me that Bruce Kelley hired him and his friend Andy to clean out what had been a chicken coop in order that Bruce could begin installing his collection.

Ron Roach, W2FUI  
AWA Operations Manager

### RCA, AWA AND ARCI ARCHIVES ACCEPTED BY SMITHSONIAN INSTITUTION & IEEE LIBRARY

The digital collections of the Radio Club of America, Antique Wireless Association and the Antique Radio Club of Illinois were submitted as a group to the Smithsonian Institution with the approval of each of their Boards of Directors earlier this year. These three important radio archives were accepted into the Smithsonian's permanent collections in July. They will be housed in Andover, Maryland at the Smithsonian Institution Libraries Research Annex in the Science and Technology collections. This is the primary location for the libraries' radio and communications documents.

Together, these collections represent important perspectives on the growth and development of radio and electronic communications. These organizations and their records encompass the inventors and developers of wireless telegraphy, radio and television (RCA); the principal historians who are documenting those stories and preserving important artifacts (AWA); and one of the largest groups of amateur collectors of this early electronic technology (ARCI). As a group, the digital records of these organizations portray the evolution of communications technology.

The three collections were compiled on the 100th anniversary of RCA in 2009, and the 30th anniversary of ARCI in 2010, and include the most recent available digital collections of the AWA's more than 50 years of publications. Additional contributions by AWA will be forwarded to the Smithsonian as they are completed.

David Bart (representing RCA, AWA and ARCI) made the submission after meeting with librarians managing the George H. Clark "Radioana" Collection at the National Museum of American History Archives Center in Washington, D.C. earlier this year. A letter of acceptance was received from the Director of the Smithsonian Libraries in July thanking all three institutions for their donations, noting that "Researchers using SIL's Research Annex will find this donation especially significant."

The digital records encompass all the publications of RCA, including its Proceedings of the Radio Club of America and other books; all available digital issues of the AWA Review and AWA Journal (f/k/a The Old Timers' Bulletin) as well as the AWA's Telegraph Anthology; and the publications and organizational records of ARCI, including ARCI News, movies of the Muchow Museum, pictures of Radiofest, equipment contests and other examples of collector activities.

The digital collections were also submitted as a group to, and were accepted by, the Institute of Electrical and Electronics Engineers' (IEEE) Global History Center. The collections will reside in the IEEE Global History Center's library for use by future researchers. This joint submission was made in the spring after the AWA and IEEE collaborated on a research project that will be published in the 2011 AWA Review and which will also be placed on the IEEE Global History Network website.

The placement of these digital records at two nationally renowned research repositories is an important milestone for all three organizations. Each organization has a proud history. Each has shared its accomplishments and many experiences with its members in the fields of science, technology, history, preservation, collection, restoration and education. Everyone who was part of those experiences over the past 100 years contributed to these archives; helping to define, shape and influence the content of these publications and records.



# Clubs That Will Welcome You

- The Antique Radio Club of Illinois (ARCI)—Meets bi-monthly. Meets generally held at the American Legion Hall, Carol Stream IL but meets in June in conjunction with the 6-Meter Club of Illinois at the Dupage County Fairgrounds and once per year for Radiofest at the Willowbrook Illinois Holiday Inn. Check website for schedules, details and maps.) Contacts: President, Olin Schuler oshuler@comcast.net; Club Public Contact, Art Bilski, 630-739-1060, clubinfo@antique-radios.org. Website [www.antique-radios.org](http://www.antique-radios.org).
- Antique Radio Collectors of Ohio—meets first Tuesday of each month at 2929 Hazelwood Ave., Dayton, OH (4 blocks east of Shroyer Rd. off Dorothy Lane) at 7 p.m. Also annual swap meet and show. Membership: \$10.00 per year. For more info, contact Karl Koogler: mail to above address; phone (937) 294-8960; e-mail KARLKRAD@GEMAIR.COM.
- California Historical Radio Society—For info on current meetings, call the CHRS hotline: (415) 821-9800.
- CARS, the Cincinnati Antique Radio Society—Meets on the third Wednesday of each month at Gray's History of Wireless Museum, which is part of The National Voice of America Museum of Broadcasting, Inc., located in a building that is now on the National Historic Register at 8070 Tylersville Road, Westchester, Ohio. 45069. For more information contact Bob Sands at (513) 858-1755.
- Carolinas Chapter of the AWA—Hosts four “mini-swap-meets” each year (in January, May, July and October) plus an annual conference, “Spring Meet in the Carolinas,” on the 4th weekend in March. Executive committee meets approximately quarterly. For more info, visit the web site at CC-AWA.ORG or contact Ron Lawrence, W4RON, Chapter President, P.O. Box 3015, Matthews, NC 28106-3015; phone (704) 289-1166; e-mail W4RON@carolina.rr.com.
- Central Ohio Antique Radio Assn.—Meets at 7:30 p.m., third Wednesday of each month at Devry Institute of Technology, 1350 Alum Creek Rd., Columbus. (1-70 Exit 103B.) Contact: Barry Gould (614) 777-8534.
- Delaware Valley Historic Radio Club—Meeting and auction begins 7:30 p.m. on the second Tuesday of each month. Location: Telford Community Center on Hamlin Ave. in Telford, PA. Annual dues: \$15.00, which includes a subscription to the club's monthly newsletter The Oscillator. For more info contact Delaware Valley Historic Radio Club, P.O. Box 5053, New Britain, PA 18901. Phone (215) 345-4248.
- Houston Vintage Radio Association (HVRA) meets the fourth Saturday (January thru October) at Bayland Park 6400 Bissonnet, 9 a.m. in SW Houston. Each meeting includes an auction and program. Annual two day convention held in February includes three auctions, old equipment contest, technical talks, swap meet, and awards banquet. One day MEGA auctions held in the spring and fall. A newsletter, The Grid Leak, is published bi-monthly. Event postings, announcements, photos and other features are available on HVRA web site: [www.hvra.org](http://www.hvra.org). Membership is \$20/yr. Address: HVRA, P.O. Box 31276, Houston TX 77231-1276 or call Bill Werzner, 713-721-2242; email: werz1943@gmail.com
- Hudson Valley Antique Radio & Phono Society—Meets third Thursday of month, 7 p.m. Meeting, swap meet, and membership info: Peter DeAngelo, President, HARPS, 25 Co. Rt. 51, Campbell Hall, NY 10916. (914) 496-5130.
- Indiana Historical Radio Society—Meets quarterly in Feb., May, Aug. and Oct. Flea market, old equipment contest and auction at all events. The IHRS Bulletin has been published quarterly since 1971. For meet details and information about the club and our Indiana Historic Radio Museum in Ligonier, IN. see our website at [www.indianahistoricalradio.org](http://www.indianahistoricalradio.org), contact Herman Gross, W9ITT, at 1705 Gordon Dr., Kokomo, IN 46902-5977 (765) 459-8308, or email w9itt@sbcglobal.net.
- London Vintage Radio Club—This Ontario, Canada club meets in London on the first Saturday of January, March, May, June and November. Annual flea market held in Guelph, Ontario in September in conjunction with the Toronto club. Contact: Lloyd Swackhammer, VE3IIA, RR#2, Alma, Ontario, Canada N0B1A0. (519) 638-2827. E-mail contact is Nathan Luo at lvrceditor@yahoo.com.
- Mid-Atlantic Antique Radio Club (MAARC)—Meets monthly, usually on the third Sunday of the month at the Davidsonville Family Recreation Center in Davidsonville, MD. (But meets once or twice a year in Northern Virginia—check website for schedules, details and maps.) Contacts: President, Steve Hansman, 855 Arundel Drive, Arnold, MD 21012, (410) 974-0561, email: shans01a@comcast.net; Membership Chair, Geoff Shearer, (703) 818-2686, email: gshearer2@verizon.net. Website [www.maarc.org](http://www.maarc.org)
- New Jersey Antique Radio Club—Meets second Friday each month, 7:30 p.m. Holds three annual swap meets. Visit the website, [www.njarc.org](http://www.njarc.org) or contact Phil Vourtsis, 13 Cornell Pl., Manalapan, NJ 07726, (732) 446-2427, pvourtsis@optonline.net.
- Northland Antique Radio Club (Minneapolis/St. Paul)—hosts four events with swap meets each year (in February, May, September and November) including an annual conference, “Radio Daze,” for two days in mid-May. Annual dues are \$12.00, which includes a subscription to the club's quarterly newsletter. For more info, visit our web site at [www.geocities.com/northland\\_geo/](http://www.geocities.com/northland_geo/); contact Ed Ripley at (651) 457-0085; or write NARC, P.O. Box 18362, Minneapolis, MN 55418.
- Northwest Vintage Radio Society—meets the second Saturday of each month at Abernethy Grange Hall, 15745 S. Harley Ave. Oregon City, OR. Meeting starts at 10:00 a.m. Membership \$25.00 per year. Guests welcome at all meetings and functions except board meetings. Spring show, the second Sat. in May. For more information, contact Mike McCrow 503-730-4639; e-mail: tranny53@comcast.net.
- Oklahoma Vintage Radio Collectors—Meets second Saturday of each month, (except for April, October, and December), at Hometown Buffet, 3900 NW 63rd St., Oklahoma City, OK. Visitors welcome. Dinner/Socializing, 6 p.m., meeting, 7 p.m. Swap meets on second Saturday in April and October at 8 a.m., Midwest City Community Center, 100 N. Midwest Blvd., Midwest City, OK. Membership \$15/year including monthly Broadcast News. Info: contact

Jim Collings at (405) 755-4139 or jrcradio@cox.net. Website: www.okvrc.org.

- Ottawa Vintage Radio Club—Meets monthly (except June and July) in the Conference Room, Ottawa Citizen, 1101 Baxter Rd., Ottawa, Ontario, Canada. Contact: Lea Barker at (613) 829-1804 or check www.ovrc.org. Membership: \$10 Canadian/yr.

- The Pittsburgh Antique Radio Society welcomes visitors to our Saturday flea markets, contests and clinics held at least four times yearly. A fall auction is included in September and our annual luncheon program is on the first Saturday in December. An annual Tri-State Radio Fest is held in April. Our journal, *The Pittsburgh Oscillator*, is mailed quarterly. For more information visit us at <http://www.pittantiqueradios.org>, email President Chris Wells at [radioactive55man@comcast.net](mailto:radioactive55man@comcast.net), or phone Treasurer Tom Dixon at 412-343-5326.

- Society for Preservation of Antique Radio Knowledge (SPARK)—Meets monthly at Donato's Pizzeria, 7912 Paragon Rd., Centerville, OH. Annual swap meet. Membership, \$18/year. Write SPARK Inc., P.O. Box 292111, Kettering, OH 45429; e-mail [sparkinc@juno.com](mailto:sparkinc@juno.com) or call John Pansing at (937) 299-9570.

- Texas Antique Radio Club—Meets alternate months in Kyle and Shertz, TX. Contact: Doug Wright, 625 Rolling Hills Dr., Canyon Lake, TX 78133. e-mail [dwjw@gvtc.com](mailto:dwjw@gvtc.com); website [www.gvtc.com/~edengel/TARC.htm](http://www.gvtc.com/~edengel/TARC.htm)

- Vintage Radio and Phonograph Society (VRPS) meets monthly on the third Saturday. Located in the Dallas, Fort Worth Metroplex, our current activities are annual convention, auctions, swap meets, repair training sessions and monthly programs. For details visit our website [www.vrps.org](http://www.vrps.org), or by contacting VRPS President Jim Sargent at (817) 573-3546 or [bsargent@swbell.net](mailto:bsargent@swbell.net).

## TIPS AND TIDBITS

### LEATHERETTE LORE

Many old radios were covered with black leatherette, Zenith Trans-Oceanics being probably the best known. Storage for long periods of time in a warm dry climate may have caused the glue holding the leatherette to the case to dry out; storage in a damp basement may have caused the glue to decompose. In either case, you may now be faced with the job of regluing separated areas.

If the problem was dampness, first allow the radio to dry out for several weeks at normal room temperature and humidity. When you are ready to start, your first inclination might be to use contact cement, but I don't advise it. This adhesive is highly flammable, should only be used in well-ventilated areas, and is unforgiving should you misalign the mating surfaces.

My solution is to use ordinary white paper paste. This dries slowly enough to allow smoothing out wrinkles, and any excess may be wiped off with a damp sponge or cloth. Allow a day for the paste to dry thoroughly.

Now you're ready to freshen up the appearance of the leatherette-covered case. First, use masking tape to cover up all surfaces (plastic, cloth, Bakelite, etc.) adjoining the leatherette areas. Then apply a coat or two of liquid black shoe polish to the cabinet, using the foam applicator that came with the polish. Allow time for thorough drying, buff the case with a soft cloth, remove the masking tape, and enjoy the newer appearance of your old radio.

Note that masking tape was used to keep the polish off surfaces it was not meant for. This is a good habit to form during any restorative process. The wrong polish can permanently stain wood or leatherette and change the color of plastic or Bakelite. Grille cloth is easily stained and decals may be loosened. Take the time to tape, but not over decals—which could be pulled up on removal. Instead, tape clear plastic over the decal. And remove the tape as soon as possible, it gets difficult to remove as it ages.

by Dick Mackiewicz

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### EASY DOES IT WITH PANELS AND DIALS!

Silk-screened panels were common on 1920s battery sets, and often included intricate scrollwork in gold. When cleaning such panels, start by careful brushing with a dry Q-tip in an inconspicuous area of the design. If the decoration does not wipe off, switch to a very soft cloth and gently remove all surface dust. Now test again with your Q-tip, this time dampened in warm water. If ok, gently wipe down the entire panel with a soft, damp cloth. Go over a small area at a time and proceed slowly! Stop immediately if some part of the design begins to come off. If that cleaning went well, go over the panel with a MILD solution of liquid dishwasher detergent and WARM water (test with a Q-tip first!). To preserve your panel, you now may apply a coat of liquid car wax containing NO cleaners. Test in a small corner first!

I have seen all the numbers disappear from celluloid dials (commonly used in the late 1920s through early 1940s) after they were merely wiped with plain cold water! The grease and grime accumulated over many years apparently acts as a solvent for the paint. Before cleaning a dial, carefully test the inside and outside surfaces (in an inconspicuous area) by gently wiping a tiny part of the design with a damp Q-tip. If that works, proceed as previously suggested for silk-screened panels, working your way up to a mild detergent solution. But don't use wax or polish.

Dial glass carrying a design can usually be cleaned safely on the non painted side. Lay it on a soft surface, don't allow the glass to move around as you work with it, and don't allow water to seep under the painted side. Now turn the glass over and clean as suggested for dials and panels, testing with a Q-tip as you go.

If the detail begins to loosen or flake, you can either leave it alone and hope for the best or try preserving it by CAREFULLY spraying one or two fine coats of Krylon Crystal clear. This also does a good job of protecting dry transfer decals.