

14th ANNIVERSARY ISSUE

ANTIQUE RADIO CLASSIFIED

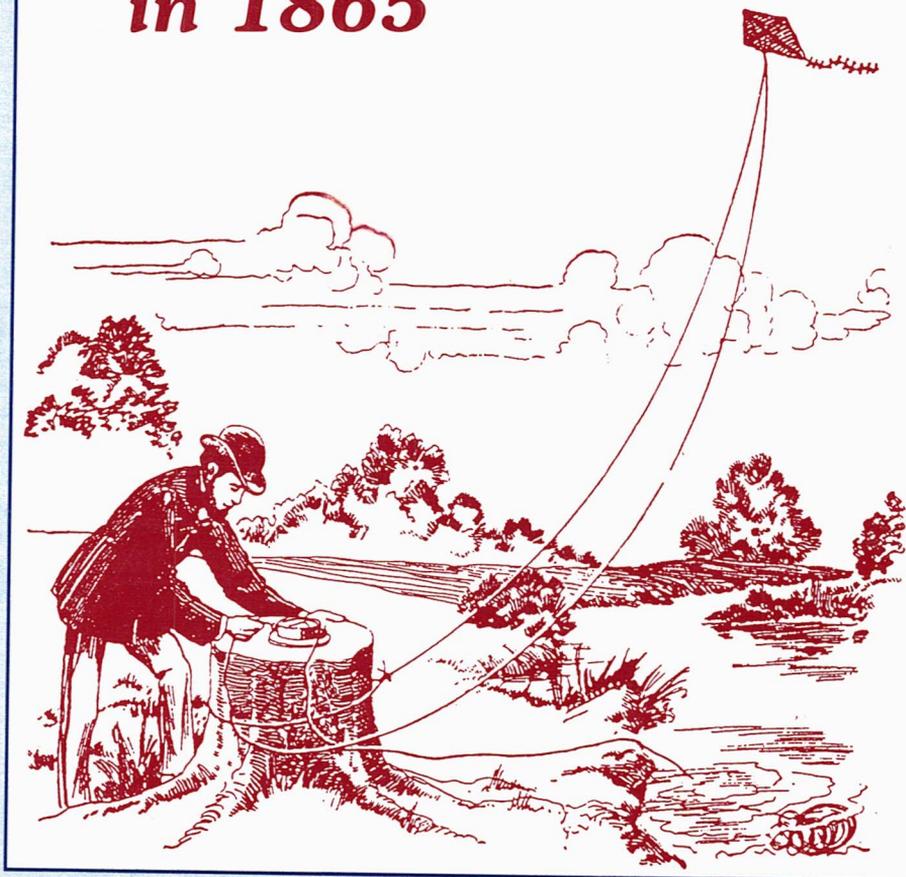


VOLUME 15

JUNE 1998

NUMBER 6

# Wireless in 1865



A.R.C. — THE NATIONAL PUBLICATION FOR BUYERS AND SELLERS  
OF OLD RADIOS AND RELATED ITEMS — PUBLISHED MONTHLY

# ANTIQUE RADIO CLASSIFIED

Antique Radio Classified (ISSN:8750-7471) is published monthly, 12 times per year, by John V. Terrey, One River Road, P.O. Box 2, Carlisle, MA 01741. Periodicals postage paid at Carlisle, MA, and additional mailing offices. Telephone: (978) 371-0512, 8:30 AM to 6:00 PM ET weekdays; machine answers phone at other times.

Annual subscription rates within the U.S. are \$40.95 by Periodicals mail and \$57.95 by First Class mail.

Annual foreign rates. By air: Canada - \$61.00; Mexico - \$67.00; Other foreign countries - \$105.00. Surface mail: Canada - \$51.00; Other foreign countries - \$58.00. (Surface delivery to countries other than Canada may take two or more months and cannot be guaranteed.)

Two-year subscriptions are twice these rates and receive an extra month. Sample issues are available free on request.

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POSTMASTER: Send address changes to Antique Radio Classified, P.O. Box 2, Carlisle, MA 01741.

Printed in U.S.A.

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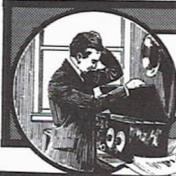
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# ANTIQUE RADIO CLASSIFIED



## EDITOR'S COMMENTS

Anniversaries are always steeped in nostalgia, and A.R.C.'s 14th anniversary issue is no exception. Here we are in June 1998 commemorating our own progress, and at the same time, looking back at the work of the 19th century scientists who made radio possible.

Our lead article, "The First Spark" by Pierre Demerseman and Richard Foster, speaks to the experiments of those who preceded Hertz and Marconi in pursuit of wireless communication. An interesting coincidence is that 1998 marks the 110th anniversary of Hertz's experiments, which proved that radio waves are the same as light waves, differing only in frequency. But, who really ignited that "first spark"? Is there a definitive answer?

In relation to A.R.C.'s history, 10 years ago, we published a 2-article series (November 1987 and June 1988) commemorating the 100th anniversary of Hertz's discovery. And our own research indicates that in 1898, 10 years after Hertz's discovery, Marconi, whose patent was issued in 1897, made his first sale of equipment to the British War Office for use in the Boer War.

All of which leads to the obvious conclusion that the history of radio is perpetually fascinating, and that A.R.C. is glad to be a part of its preservation.

In keeping with this historic theme, Dave Gonshor's article on the Queen induction coil is right on the mark. Wireless experimenters everywhere at the turn of the century were using induction coils.

To expand on Dave's article, Jim Kreuzer searched his archives for information on the history of Queen & Co. Jim's article tells of Queen's success in the manufacture of scientific apparatus, including the induction coil, priced at \$85 to \$240 — no small sum at the time.

Moving into the 1920s, Ray Bintliff writes about a "flea market find" that we have called a "G" radio because of its only identifying mark. This radio is conventional in many ways, but Ray points out that its features are inconsistent. As always, we look to readers for more information.

Richard Arnold takes us into the 1930s with his article on a GE Model K-63, a 6-tube, mid-sized cathedral, marketed by RCA as its Model 120. This ornate set has an unbalanced knob configuration, and, according to Richard, is a prize at almost any price.

Among the interesting items in *Photo Review* is an unusual Cleartone horn speaker which looks much like a Dictogrand speaker, but has a built-in 1-tube amplifier. Having received Erwin Macho's ads from Vienna for so many years, we're delighted that he shares with us another photo of one of his fine crystal sets.

Of the three estate auctions included this month, two were contributed by Ray Chase and one by Steve Morton of the Nebraska Antique Radio Club. Of interest in the Windsor Auction in New Jersey were early items that brought big prices from the estate of Anthony Budenkaye; for example, a Western Electric SCR 68 transmitter at \$550 and a DeForest crystal set at \$470.

At the third Amer Auction in Pennsylvania, a high point of the Joseph Kanuski estate sale was a Saal

pedestal speaker selling at \$440. Vacuum tubes also sold well. The Nebraska Antique Radio Club auction included an assortment of crystal sets, battery sets, consoles, and cathedrals. But, the highlights were early phonographs, one of which sold for over \$1,700.

In keeping with our historical theme and with A.R.C.'s anniversary month, we decided to expand a letter we had received from Russell Barker into an article. The article describes a visit to Play Things of Past, the store of our founder, Gary Schneider, in Cleveland, Ohio. Russ invites you all to visit Gary's amazing storehouse of radio-related items and to peruse his latest catalog. You might also want to look Gary up at the many meets and collectors' events he attends.

No radio repairman would ever be without every Rider's *Perpetual Trouble Shooter's Manual* he can lay hands on. In fact, there are 23 volumes of them, but Charles Kirsten concentrates on the elusive details of the very first volume. He defines three versions and explains their differences, as well as their usefulness.

Two additional guides to Rider's manuals are *The Radio Diagram Sourcebook* by Richard Gray and *The Locator* by G. Larsen. Both are reviewed by Richard Foster, who has been a heavy contributor this month. Richard concludes that these books are useful additions to Rider's manuals for every collector's bookshelf.

Robert Goad shares with us his Ekco teapot, another version of Gérard Faassen's teapot shown in the March 1998 A.R.C. The one-eyed cat lid makes an amusing variation on this advertising gimmick for the Ekco AD-65.

*Radio Miscellanea* contains a real kudos for A.R.C. Be sure to note what publication we beat out for first place in Robert Gardner's magazine hierarchy. Other reader comments include the fact that the Internet has negative vibes for some readers, and that our April fooling has long-range effects.

**Coming Radio Events.** Wise collectors have already planned for the summer's big events, such as Radioactivity in Laurel, Md., June 11-13; Cincinnati's Radio Rama in Florence, Ky., June 26-27; Extravaganza in Lansing, Mich., July 10-12; Radiofest in Elgin, Ill., August 5-8; and the AWA Conference in Rochester, N. Y., September 2-5. If you can't make these big ones, be sure to attend a meet or two in your area. We hope to see you at many of these events.

Happy collecting!

John V. Terrey, Editor

## ON THE COVER

Our cover is an illustration from the patent papers of Mahlon Loomis. It was reproduced in an article in *Radio News*, November 1922, from which we obtained a copy. The drawing illustrates Loomis' experiment showing how static electricity induced in an elevated wire caused an electrical discharge, which could be detected at a separate receiver. Loomis was ahead of his time in envisioning long-distance communication via wireless telegraphy, and his experiments led the way for Hertz and Marconi.



# THE WIRELESS YEARS

## The First Spark

BY PIERRE DEMERSEMAN AND RICHARD FOSTER

In this article, Demerseman and Foster cover ground that may be unfamiliar to many A.R.C. readers — the observations and experiments of 19th century scientists who preceded Hertz in his famous work on electromagnetic waves. Demerseman and Foster have known each other for about ten years and have communicated frequently across the Atlantic on a favorite subject — radio. Collaboration on the following mutually interesting topic was made easier by another wonder of modern technology — the fax machine. (Editor)

What's in a name? Sometimes a great deal. Take the name "Hertz," for example. Turn on the radio and you might hear the name everyday — the station call letters may be followed by the number of "megahertz" (MHz), meaning one million hertz, a measure of frequency of radio transmission.

Why should the name of German physicist Heinrich Hertz have been so perpetuated in such a unique way? Even serious radio collectors may not be quite clear about the answer. But, the fact is that between 1884 and 1888, while a professor of physics at Karlsruhe Polytecnic, Hertz conducted experiments that confirmed beyond doubt the existence of electromagnetic waves in the radio frequency band. These experiments can be called complete because they demonstrated other properties of radio waves, such as absorption, reflection, refraction and resonance phenomena.

To honor Hertz's name, German scientists in the early 1920s proposed the term "hertz" to be used in connection with the frequency of any

phenomenon with regular periodic variations. In October 1933, the International Electrotechnical Commission formally adopted the term "hertz" as the unit of measure still in widespread use today.

But, the work of any great scientist harks back in some way to the work of his predecessors. Hertz's experiments can be called rational in the sense that they were intended to verify the validity of the theory that James Clerk Maxwell had published fifteen years earlier in his *Treatise on Electricity and Magnetism*.

Working from a purely mathematical basis, Maxwell desired to clarify the nature of luminous rays. In addition, he was able to foresee the existence of other rays of the same physical nature, but invisible. It is now well known that visible light and radio waves make up part (between 2 and 25 percent respectively) of the continuum of the magnetic spectrum which extends from radio frequencies to cosmic rays.

It is through the use of sparks that Hertz was able to generate waves of very high frequencies. However, sparks were already known and had been used for experiments long before 1888. The intent of this article is to call attention to certain observations, sometimes accidental, which, if their authors had been able to carry them through to conclusion, would have brought about the birth of radio sooner.

### EARLY SPARK OBSERVATIONS

We can trace observations of the phenomena of sparks as far back as Ancient Rome. In "Com-

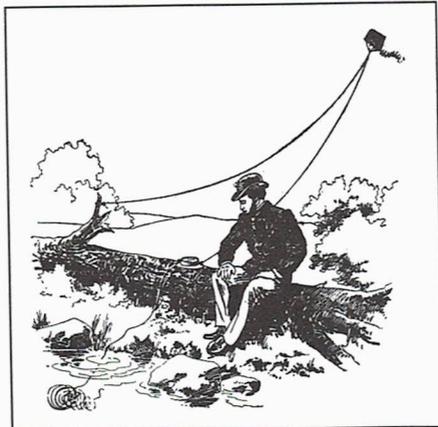
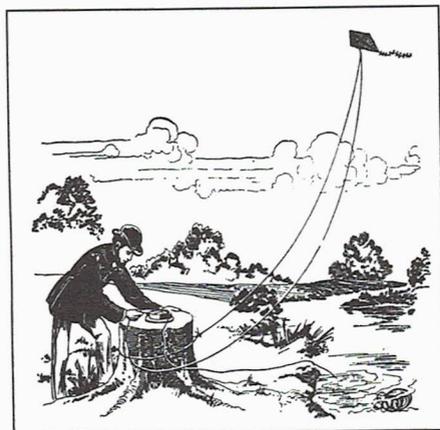


Figure 1. Copies of the drawings which appeared in the patent papers of Mahlon Loomis. Left: Static electricity induced in an elevated wire caused an electrical discharge. Right: At the receiving end, the electrical discharge induced a smaller current in the wire and deflected a galvanometer. (Radio News, Nov. 1922, p. 836.)

mentaries on the Gallic Wars" in *De Bello Gallico*, Caesar reports phenomena of luminescence around the points of the lances of his soldiers during storms. About a century later, Seneca in *Natur Quaest* carefully describes observations concerning electric halos which appeared during stormy weather at the points of cavalry pikes without causing burns or even shocks.

We should probably also acknowledge the innumerable accounts by navigators concerning that luminous electrical discharge called "St. Elmo's fire." Other observations, unexplained, were made during the course of the first experiments carried out in the 18th and 19th centuries with electrostatic machines and induction coils. Some of these observations could even have induced brain waves!

But let's take a look at more concrete elements, many of which were put together very coherently in an excellent study by Charles Susskind in the I.E.E.E. *Spectrum* articles of 1968

### MAHLON LOOMIS

In 1872, Mahlon Loomis, a Washington dentist, filed a patent entitled "Improvement in Telegraphing" in which he claimed the utilization of natural electricity to work a system of wireless telegraphy using no batteries. With fine metallic wires suspended from kites linked to the earth and distant from one another by several miles, the method allowed the user to communicate between the two points. Figure 1 depicts Loomis' transmitting and receiving equipment.

Interruptions in one of the circuits would cause "electrical disturbances" which were observable in the other, "thus allowing the transmission of messages that could be converted to human language." This invention concerning telegraphy would probably have posed some safety problems for operators during storms. Loomis envisioned that his apparatus could be used to "communicate from one continent to another," as shown in Figure 2.

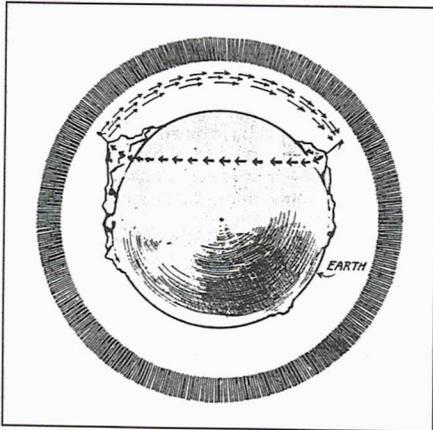


Figure 2. An illustration used by Loomis to demonstrate how communication between distant points would be possible. He believed the electricity in air surrounded the globe and extended to the limit of the atmosphere beyond which there was a vacuum. (*Radio News*, November 1922, p. 837)

Loomis was a prolific inventor who filed five other patents concerning dental prostheses (1854 and 1868). An uninterrupted series of financial problems prevented Loomis from continuing his experiments, and he died ruined in 1886.

These first experimental attempts already foreshadowed the notions of interrupted currents and of antennas. They remained without further interpretation.

### HOUSTON AND THOMSON

Something much more important was done at about the same time. In 1876, an article signed by Edwin J. Houston appeared in the *Journal of the Franklin Institute* (Vol. 71), which reports experiments carried out in 1875 with his very young colleague Elihu Thomson at the Central High School in Philadelphia.

This article is a continuation of an earlier one — Volume 61, June 1871 — describing an attempt at wireless communication of a more experimental character. It reports the first production of sparks at a distance, and even the lighting of a gas lamp when someone drew his finger near the gas at the same time an induction coil connected to the earth and to an insulated wire was caused to function.

The results of experiments by Thomas Edison, reported in *Scientific American* in 1875 and 1876, incited Thomson and Houston to go back to their work on what they called "a phenomena of induction."

Using a Ruhmkorff coil capable of producing 15 cm sparks, they noticed that the connection of one end of the secondary coil to a gas or water pipe and of the other end to a large insulated or partially insulated conductor resting on a dry wooden table would cause a considerable increase in the volume of the spark. It would also cause a noticeable whitening of the spark.

These results are similar to those obtained by adding a Leyden jar to the circuit. While the machine was operating, it was possible to obtain sparks between metallic objects located in the same room or between metal objects in separate rooms. The two experimenters refined their observations and reported the following:

- The gold leaves of a sensitive electroscope show no divergence if the instrument is put into contact with the objects producing the sparks.
- A galvanometer does not move, even if connected into the secondary of the spark coil.
- A small bit of cotton is neither attracted nor repelled by the objects producing the sparks.
- A spark can be produced between the two ends of a loop of metal wire.

At the end of this article in the 1876 *Journal of the Franklin Institute*, Houston and Thomson also show that the functioning of their apparatus induced small crackling noises in the internal telegraph lines of the school. In conclusion, they deduce that all the observed manifestations can be explained by "very rapid oscillations of current with subsequent reestablishment of the electrical equilibrium in a tiny fraction of a second... The presence of the inverse current immediately following the initial current prevents totally and necessarily the establishment of the electric polarity necessary for electroscopes, galvanometers and similar instruments."

(Continued on following page)

(The First Spark continued)

In another 1876 *Franklin Institute Journal* article, the two scientists refine their experiments further. Using, as Edison had done, a black box to permit better observation of the sparks shown in Figure 3, they conclude that the apparatus, to function, must have a dissimilarity of polarity and that the effects observed are due to "inverse currents of induced electricity." A note by the editor-in-chief of the *Journal* (Vol. 71, p. 63) confirms Houston's prior claim.

The reality and date of the experiments related above are also confirmed by Professor Monroe B. Snyder in a 1920 article in *General Electric Review*. Snyder reports that, while working in the observatory located on the fifth floor of the Central High School of Philadelphia, he was surprised one

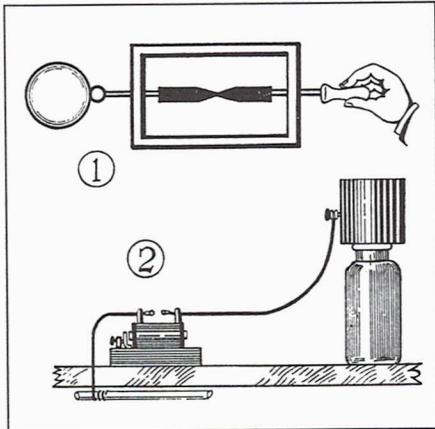


Figure 3. A sketch showing the apparatus used by Elihu Thomson in his wireless transmission experiments. The transmitter (2 above) consists of a 2-inch spark coil with a tin can atop a glass jar as an antenna. The receiver (1 above) consists of a black box, open on one side, with two graphite pencil points adjusted a fraction of an inch apart, connected to a large brass ball outside. A tiny spark is observed between the pencil points when the transmitter is operated. (*Radio News*, September 1922, p 450)

day in 1875 by the arrival of his colleague Professor Thomson. The latter, a lead pencil in his hand, was drawing sparks from the brass door-knob of the library located 30 meters above the ground floor on which was situated the Ruhmkorff coil. Five floors lay between.

Snyder concluded that it was a great shame that his two colleagues didn't continue their experiments on these waves which "traversed the ether." Indeed, Thomson turned his attention back to his beloved dynamos and was thus involved, like Edison, in preparations for the Exposition of 1876 celebrating the centenary of the United States. A description of the results of Houston and Thomson's experiments was taken up in succinct fashion by *Radio News*, 1923, and *Onde Electrique*, 1923.

## SYLVANUS P. THOMPSON

Also in 1876, Sylvanus P. Thompson showed that the discharge of sparks is certainly of an oscillatory nature by using a rarified gas tube associated with an analyzer with a rotating mirror. Thompson, a British subject, worked in the U. S.

## DAVID E. HUGHES

Around 1878-79, David E. Hughes, another Englishman, carried out experiments in wireless transmission that he published in 1899 in *Electrician* because none of the three scientists to whom he had shown his results believed that they showed transmission at a distance. Hughes had noticed that an earphone included in a circuit which featured "an imperfect contact" registered clicks produced by an inductive system whose circuit was repetitively opened by an interrupter commanded by a clockwork. He made this observation during the utilization of a metal-detecting apparatus (induction balance) with which he was studying the structure of metallic alloys.

Hughes then constructed a classic spark generator, which could be connected or not connected to ground. It also used a variety of aeriels, and a clockwork caused its interruption. The receiver was a microphone of carbon granules featuring "imperfect contact" coupled to an earphone. Thus, Hughes was able to hear distinctly the clicks when the transmitter and the receiver were separated by twenty meters and placed in two different rooms.

Later, while walking in Great Portland Street, the microphone detector in his hand and the phone on his ear, he detected signals up to five hundred meters away. He also observed standing wave phenomena through reflections from the facades of certain buildings. A demonstration was made for three hours on February 20, 1880, in the presence of Professors Spottiswoode, Stokes and Huxley. They stated that all of the phenomena observed could be explained by the classic effects of electromagnetic induction.

## OTHERS IN PURSUIT OF THE SPARK

In 1882, Amos E. Dolbear described a method of wireless telegraphy. The transmitter consisted of an induction coil one of whose poles was connected to ground and the other to an aerial by means of a condenser, shown in Figure 4. The primary was connected to a battery through a microphone. The receiver was a simple earphone of his own manufacture, itself connected to an aerial through a condenser.

Dolbear claimed transmissions were received at a distance of 20 kilometers. He was convinced that his method, in fact, used transmission through the earth.

In August 1888, just a month after Hertz's paper was published, Sir Oliver J. Lodge published his paper on resonance — "On the Theory of Lightning-Conductors." Lodge also came very close to explaining radio waves.

## AT LAST — WIRELESS COMMUNICATION

From then on things moved very rapidly because the fruit was ripe. In 1890, Branly perfected a detector of waves produced by sparks. Building

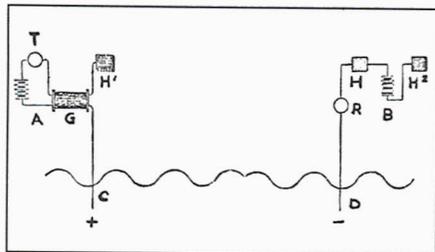


Figure 4. Dolbear's transmitting apparatus is shown on the left, and receiving apparatus, on the right. G=spark coil, T=microphone, R=headpiece, H=condenser. (From Fahie, p. 100.)

on the works of Branly, Lodge, Hertz, and others in the mid-1890s, Marconi developed a practical method of wireless communication. By 1901, he actually communicated across the Atlantic without wires. In 1904, Fleming invented the vacuum tube diode; three years later, DeForest invented the triode. In 1917, the superheterodyne was patented by Levy and Armstrong.

This article is not intended as an exhaustive review of the experiments and/or observations which led to the discovery of Hertzian waves. It is simply a glimpse for the reader, that, we hope, will generate other articles or produce new documents. Then anyone interested may be able to determine in which brain burst forth the first spark.

An earlier version of this article originally appeared in Number 88 of the official journal of the French Collector Association: Association des Amis du Musée de L'ElectroAcoustique.

[Previous articles on Henrich Hertz appeared under the "Wireless Years" banner in November 1987 and June 1988, the 100th anniversary years of Hertz's experiments.]

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The authors wish to express their gratitude to Mr. P. Leggatt and Mr. J. C. Montagne for locating and providing documents, and Mme. M.-C. Mouthier, librarian at the Curie Institute, for searching out publications. We are also indebted to the staff of the Periodical Department of the Boston Public Library.

(Pierre Demerseman, 27 rue Bezout, 75014 Paris, France; Richard Foster, 12 Shawmut Ave., Cohituate, MA 01778)

Pierre Demerseman is the Honorary Director of Research of the National Center for Scientific Research and Director of the Research Laboratory of the Institut Curie in Paris. A member of the American Chemical Society, the A.W.A., the Club Histoire et Collection Radio, and the Amis de l'Electro-Acoustique, he has been a collector of radio gear for many years, and of American sets for the last ten years.

Richard Foster, a professional woodworker, specializes in the restoration of antique radios, particularly radios for old cars. He has published many articles in A.R.C. and elsewhere and has given workshops on rebuilding and refinishing wooden radio cabinets, as well as repairing the electronic components. He is also frequently called upon for his widely known expertise in Philco receivers.

# WITH THE COLLECTORS

## The "Queen" of Induction Coils

BY DAVE GONSHOR

*In this article Dave Gonshor describes a rare Queen & Co. induction coil and underscores the significance of the induction or spark coil to early wireless. (Editor)*

Guglielmo Marconi received the first transatlantic wireless message at Cabot Tower in Newfoundland on December 12, 1901. The message was sent in Morse code, not voice. In part, this remarkable event was made possible because of a basic understanding of the physics of coils. The Queen & Co. induction coil shown in Figure 1 is an apparatus that forms the heart of a wireless spark transmitter.

The Queen & Co. induction coil is similar in construction to other induction coils of the time (circa 1915), most notably the widely used Ruhmkorff coil. The Queen coil has the added feature of an on-off switch, shown in Figure 2. Notice the massive brass posts and connections. The design was certainly robust!

Induction coils were used in wireless spark transmitters to step-up a pulsed voltage to a potential sufficient to break down a spark gap. The breakdown of a spark gap produces radio frequency energy which excites a resonant circuit, thus producing tuned frequency radiation related to the pulsed voltage. This was the primary means of radio transmission prior to the use of the vacuum tube. A telegraph key produced the information to be transmitted via closure of contacts consistent with the Morse code. The secret of how opening and closing of key contacts produces a signal that can be stepped up to a voltage that would spark a gap lies in the design of the induction coil.

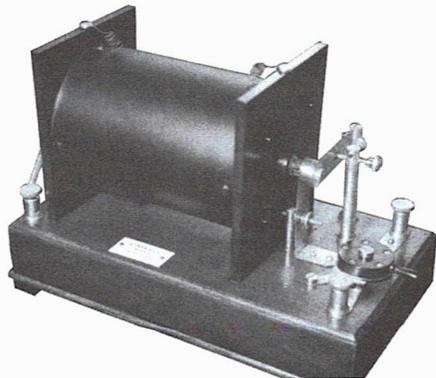


Figure 1. The Queen & Co. induction coil. The label reads "Queen & Co., Makers, Philadelphia."

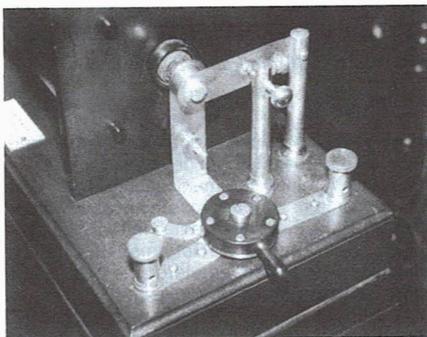


Figure 2. An end view of the Queen & Co. spark coil showing the on-off switch.

A schematic diagram for a basic spark transmitter is shown in Figure 3. A series connection of a battery, a key, a set of contacts and the induction coil primary form the low voltage circuit of the transmitter. Closing the key contacts applies the battery voltage through the contacts to the primary of the coil. Once the coil is energized, it acts as an electromagnet to attract an armature. When the electromagnet pulls the armature towards it, the primary contacts are opened thus de-energizing the coil. The spring action of the contact assembly recloses the contacts, and the primary coil is again energized. This process is repeated many times a second to produce an interrupted, or pulsating, DC voltage across the primary coil. The induction coil steps up these low-voltage pulses to produce high-voltage pulses in its secondary winding.

The high voltage secondary of the induction coil is connected to a condenser, which is a Leyden jar or a heavy glass plate condenser, which feeds the spark gap and the primary of the oscillation coil.

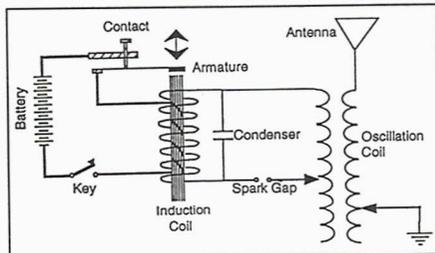


Figure 3. A schematic diagram of a basic spark transmitter.

The condenser and the oscillation coil primary form the tuned tank circuit, which establishes the transmitter frequency. The oscillation coil secondary is connected to the transmitting antenna and to ground, and is also tuned to the same resonant frequency as determined by the oscillation coil secondary inductance and the capacitance of the antenna. The transmitted power is determined by the length of the arc which could be developed

across the gap; the longer the spark the more power transmitted.

(Dave Gonshor, 7121 Jellison St., Littleton, CO 80123)

Dave Gonshor is a registered professional electrical engineer whose interest in old radios spans wireless to depression era sets.

## Queen & Co., Inc.

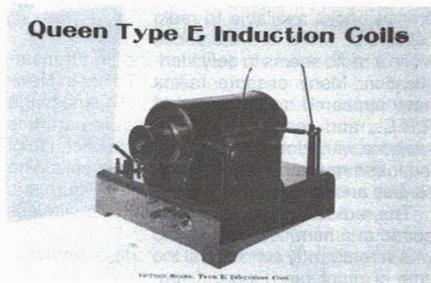
BY JAMES KREUZER

Since Dave Gonshor said he was unable to find any references to Queen & Co., we called upon the expertise of one of our contributing writers — Jim Kreuzer of New Wireless Pioneers. Fortunately, Jim was able to tap his extensive library and come up with the following historical summary of the company. (Editor)

Queen & Co. was founded in Philadelphia by James W. Queen in November 1853. Queen had formerly worked for the optical firm of McAllister & Co., established in 1783. A man of progressive ideas and considerable scientific attainments, Queen wanted to create a new business devoted to supplying the needs of technical and scientific workers. He soon achieved his goal.

At that time, Europe was the source of supply for scientific instruments in the U. S. However, Queen made frequent trips abroad and began to introduce to this country much of the early apparatus used in colleges and physics labs. His success was rapid, and he retired from the business in 1870.

Queen's interest in the company was purchased by S.L. Fox, who became its president and principal stockholder. In 1893, Fox turned the company into a corporation. However, the financial conditions of



An induction coil as it appeared in a Queen & Co. catalog. Six different sizes were offered, ranging from 4 inches selling at \$85 to 18 inches at \$240.

1893-1894 resulted in the temporary embarrassment of the newly organized corporation. Mr. J.G. Gray became assignee, and within 15 months a \$200,000 debt had been erased. The company was reorganized with Gray as president, and a few years later, he bought out Fox's entire interest.

By this time, Queen & Co. had become manufacturers on a large scale. The instruments built covered the entire field of scientific apparatus, including microscopes and engineering, mathematical, surveying, photographic, chemical, physical, electrical, astronomical, ophthalmic, and meteorological equipment. In 1903, the Philadelphia house consisted of eight sales departments and four factories with laboratories. In 1912, the company name was changed to Queen & Gray Co.

Today Queen & Co. equipment and catalogs are prized items. Queen handbooks and catalogs frequently appear for sale for hundreds of dollars in old book and scientific catalogs. They are often described as "among the most desirable scientific catalogs of the 19th century."

### References:

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Jim and Felicia Kreuzer own New Wireless Pioneers, buyers and sellers of rare radio, telegraph and electrical books. You may contact them at P.O. Box 398, Elma, NY 14059. Phone: (716) 681-3186. Fax: (716) 681-4540.



This Queen & Co. cover of a turn-of-the century catalog illustrates a 30-inch spark set-up for use with x-ray equipment.

# WITH THE COLLECTORS

## A "G" Radio Flea Market Find

BY RAY BINTLIFF

Although there are many reference books available to radio collectors, there are instances when a radio seems to defy identification. Many obscure radios have appeared on the pages of A.R.C., and readers have responded with information regarding these radios. This article describes another mystery radio.

The radio in question was acquired at a ham flea market and was in really ratty condition at the time of purchase. Figure 1 provides a front panel view of the radio after it was cleaned and made presentable. The tuning knob in the center is not original. Otherwise, the set seems to be unmodified. The radio lacks identification and contains a number of features that are not unusual when considered individually. However, in combination, they seem inconsistent.

### DESCRIPTION

The radio is a 6-tube battery-operated TRF set. The use of 6 tubes is not unusual, but 5-tube battery sets were more common. The set uses three RF stages, a detector and two stages of AF amplification. This circuit arrangement is conventional except for the use of an untuned 1st RF stage. All tubes are Type 01-A. The knob at the center tunes the radio, and the two outer knobs control filament voltage. One rheostat controls the filaments of the detector and AF stages, and the other rheostat controls the filament voltage to the three RF stages.

Figure 2 provides a rear view of the chassis, and here the set's inconsistencies begin to appear. The radio features single-knob tuning that employs an arrangement of metal bands and drums à la Atwater Kent, as shown in Figure 3. Three-knob tuning was more typical of early battery sets.

This radio also sports an illuminated dial — another feature not usually found in early battery radios. The tuning dial is calibrated from 0 to 100, another clue that the radio may be of early manufacture. Also note that the battery switch, located

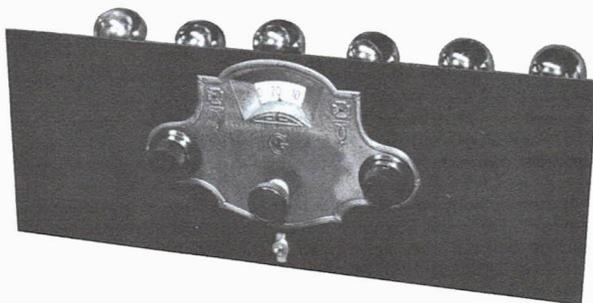


Figure 1. Front panel view of the radio.

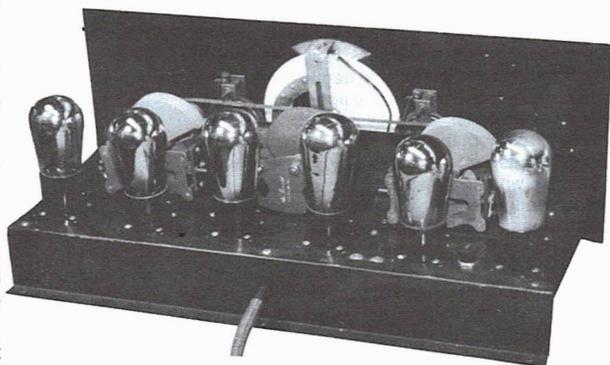


Figure 2. A rear view of the mystery radio showing the tube layout and the riveted assembly.

below the tuning knob, is a toggle switch, not at all like the commonly used rotary or push/pull types. So the question arises — was the manufacturer of this radio ahead of its time? Or was it a case of adding "modern" touches to an old design in an attempt to play catch up?

### OTHER ODDITIES

The two Cutler-Hammer filament rheostats use the coil spring type of resistance element that rotates when the knob is turned. The wiper contact is fixed. This type of construction seems to indicate an early type of rheostat that is inconsistent with other features of the radio.

All three tuning condensers are identical except for markings. Two are identified as "Erla" and manufactured by Scovil Manufacturing Company. The center condenser is marked "De Forest."

## CONVENTIONAL STUFF

The metal front panel is finished in brown crackle paint and features a large brass escheon that displays the letter "G" under the dial opening. Other than this, there is no other identification on the radio.

The chassis and rear bracket are made of

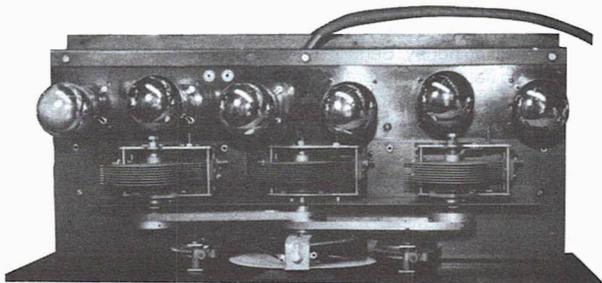


Figure 3. A top view of the radio showing the belt-driven dial assembly.

metal, and a strip of Bakelite is used for the portion of the chassis that contains the tube sockets. Riveted construction is used.

An antenna binding post and a pair of speaker tip jacks are located at the rear of the chassis. A ground connection is not provided.

Most likely the radio was originally housed in a wooden cabinet.

After I installed a set of tubes and replaced the coil in the 1st AF transformer, the radio proved to be an excellent performer.

## WHO DUNNIT?

Other collectors have suggested that the radio could be a Granco from Midwestern Company or a Gradio. Can any A.R.C. readers identify this radio or provide documentation for it? Your help will be appreciated.

(Ray Bintliff, 2 Powder Horn Lane, Acton, MA 01720)

# General Electric Model K-63

BY RICHARD ARNOLD

General Electric designed and manufactured the Model K-63 cathedral radio in 1933. However, RCA marketed the product as its RCA Model 120, a 6-tube superheterodyne. Its interesting features include a dynamic loudspeaker, automatic volume control, and a single heater type pentode output tube with continuously variable tone control.

The circuit consists of an RF stage using a Type 58 tube, a combined oscillator and first detector in a 2A7 tube, plus an IF stage using another Type 58 tube. A Type 2B7 functions as

the second detector/AVC. The audio output stage uses a Type 2A5 pentode. The full-wave rectifier is a Type 80.

During the years 1928 to 1941, sales promotion and production engineering were considered far more important than parallel research and development in stimulating demand for the ordinary home radio. Industry considered the public's request for lower costs as its higher priority, so the focus was on more inventive gadgetry, rather than basic technical improvements.

Too often the engineer was at the mercy of management's need for bottom-line, short-term profits. Financial, sales and advertising priorities overrode research, engineering and long term technical improvements.

The average cathedral radio sold for as low as \$61. In 1933, approximately 3,806,000 broadcast receiving sets were made at a value of \$230,009,000.

The K-63 is a beautiful cathedral — a prize find by cathedral collectors today, even at 5 times its original price.

## References:

MacLaurin, Rupert. *Invention and Innovation in the Radio Industry*. New York: The MacMillan Co., 1949.

RCA Victor Service Data, 1933.

(Richard Arnold, Box 275, Lone Grove, OK 73443)

Richard Arnold has been collecting radios since 1985. His interest is primarily in cathedrals and 1920s battery sets, and his collection ranges from crystal sets to a 1928 American Bosch in a Pooley cabinet. His prize is the 1932 Jackson Bell Peter Pan featured in the June 1991 A.R.C.



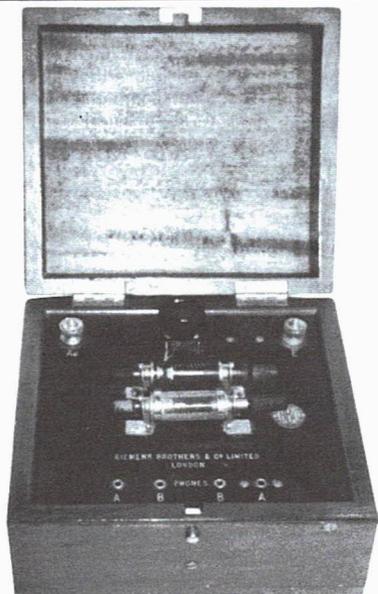
The General Electric Model K-63 cathedral.



# PHOTO REVIEW



This column presents in pictorial form many of the more unusual radios, speakers, tubes, advertising, and other old radio-related items from our readers' collections. The photos are meant to help increase awareness of what's available in the radio collecting hobby. Send in any size photos from your collection. Photos must be sharp in detail, contain a single item, and preferably have a light-colored background. A short, descriptive paragraph **MUST** be included with each photo. Please note that receipt of photos is not acknowledged, publishing is not guaranteed, and photos are not returned.



**SIEMENS BROS. & CO., LTD. TYPE 125 CRYSTAL SET** — This 1923 model, in like-new condition, has a Perikon crystal and glass-enclosed catwhisker detectors. It has a BBC/PMG stamp, GPO No. 599. (*Erwin Macho – Vienna, Austria*)



**TALKING TAPE RADIO AERIAL** — This roll of yellow braided tape can be unwound for use as 100 feet of antenna wire. It was manufactured by the Hope Webbing Co. of Providence, Rhode Island. It sold for one dollar! (*Dave Crocker – Mashpee, MA*)

**CHANNEL MASTER MODEL 6511** — This nice-looking 6-transistor radio has good sound and good reception. (*Guy Forstrom – Quinnesec, MI*)



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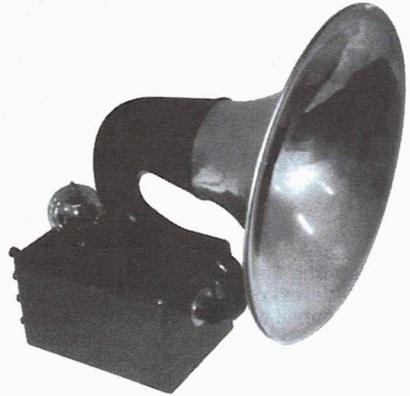
## PHOTO REVIEW

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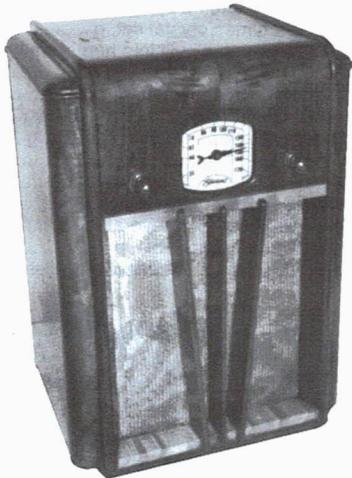
**MAJESTIC MODEL 194** – This little 4-tube cathedral, made in 1933, performs well on the broadcast band, even without an antenna! The shortwave switch is on the back of the chassis. Shortwave reception is OK, but of course it needs an antenna for the best reception. (*Ben Martin – Castro Valley, CA*)

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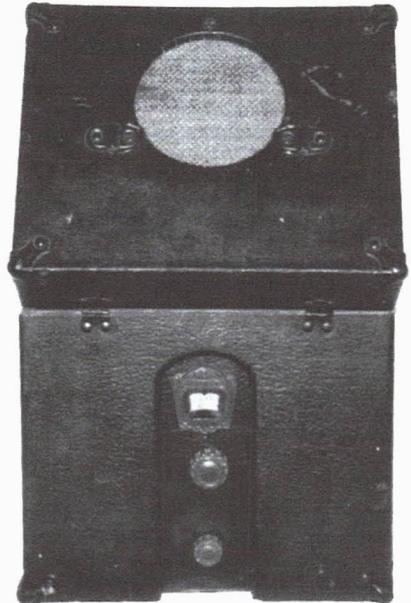
**CLEARTONE HORN SPEAKER** – Made by Cleartone Radio Co., Cincinnati, Ohio, this speaker has a 1-stage amplifier built into its base. The nickel-plated bell is 11" at the mouth and 15" high. (*Ed Bell – Raleigh, NC*)

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**SILVERTONE MINI-CONSOLE MODEL UNKNOWN** – This Silvertone console, ca. 1935, stands just 12½" tall and has a Mission Bell chassis. (*Don Howland – Spokane, WA*)

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**PHILCO JR. MODEL 80** – This AC set has 4 tubes — Types 80, 42, and (2) 36s. The Model 80 has the typical Philco back-lighted dial. The speaker is in the lid of the cloth-covered cabinet. A switch activated by the open lid prevents turning the radio on if the lid is closed. (*Francis Buren – Postville, IA*)

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# AUCTION REPORT

## Windsor Auction Westfield, New Jersey — March 14, 1998

CONTRIBUTED BY RAY CHASE

Usually the first couple of months of a new year are devoid of interesting auctions, but this year has turned out to be an active one, (something else to blame on El Niño?). On March 14th, Windsor Auctions conducted a sale of several estates at Knights of Columbus Hall in Westfield, New Jersey. Since this is the next town over from where I live, I had to be on top of it.

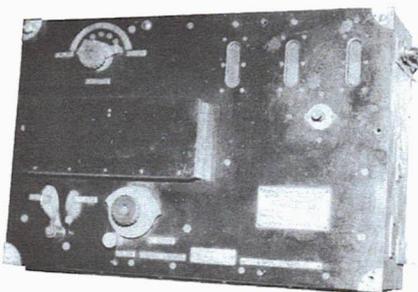
The estate of Anthony Budenkaye of Lincroft, New Jersey, contained some interesting radio items. Mr. Budenkaye, a signalman in World War II, was a civilian employee at Fort Monmouth, New Jersey, prior to his retirement.

Auctioneer John Santaguida scheduled the 37 radio lots early in this 350-plus lot auction, a plan which allowed the radio buyers to make their purchases early and then leave. Only one and a half hours were available for preauction viewing. Since the auction hall was extremely crowded, it was very difficult to preview the items properly. Some lots were very large, as the auctioneer was anxious to get on with the usual auction items for which most of the audience came.

The most interesting items were a World War I aircraft transmitter/receiver — a Western Electric SCR 68 — in quite nice condition, with two DeForest VT-1s but no transmitting tubes, selling for \$550, and a DeForest Everyman DT 600 crystal set, selling for \$470. The auction started at 4:00 PM, and after some miscellaneous items were sold, the radio items were disposed of in about 30 minutes. There was a 10 percent buyer's premium in effect which must be added to the listed prices.

All prices are rounded down to nearest dollar.  
e=excellent, vg=very good, g=good, f=fair, p=poor

**A warning:** Auction prices are not current values. Our selection of auction items is not necessarily complete. A listing such as this cannot adequately include the condition of cabinets, chassis, transformers, tubes, the operating status of the set, and the inclusion of incorrect, restored or replica components, etc. Auction prices are the result of the excitement of the auction process, the skill of the auctioneer and the specific interests of the participants. Nevertheless, auction prices serve as useful references and as another element in the value determining process. The possibility of error always exists, and if we are notified, corrections will be reported.



*This World War I Western Electric Signal Corps. SCR 68 airplane transmitter and receiver sold for \$550.*

ABC Standardized crystal set with DeForest style coils and tuner, f .....	\$85
Aeriola Sr. Amp., w/tubes, g .....	300
Atwater Kent 46 and F2 speaker, g .....	50
DeForest Everyman crystal set, g .....	470
DeForest tuner panel built into home-brew cabinet, w/coils, g .....	175
Hallicrafters HT-18 transmitter, g .....	37
Hallicrafters Sky Champion, light blue, vg .....	57
Hallicrafters SP-44 panoramic adapter, g .....	27
Hallicrafters SX-11, g .....	45
Hammarlund HQ-129-X, dirty, g .....	45
Harvey Wells TBS-50 Bandmaster, g .....	30
Headphones, (10+) and several mikes .....	40
Lafayette J42 fabric portable, p .....	12
Masco M7517, small metal cased amplifier, g ...	12



*This 180+ collection of radio books selling at \$125 supplied the buyer with a lot of reading for less than a dollar per book.*

Military LM frequency meter, new with case .. 17
QSL cards, early, large box..... 30
Radio books, hard cover, 180+ ..... 125
Radio magazines, '50s, '20s, g ..... 95
Signal Corps SCR 68 ..... 550
Stromberg Carlson console, early FM band, 10 or 12-tube model, g..... 10
Telegraph key ..... 45
Tube(s), many octals including 6L6s..... 20
Tuska Superdyne kit box, coils, capacitors, f... 40
Western Electric Signal Corps Service Buzzer, WW I, with headphone and mike, good leather, g ..... 30

Westinghouse RA, no cabinet, plus Dayton and Eisemann variometers, vg ..... 30
Weston 537 set analyzer plus 2 Weston small meters ..... 5

Windsor Auctions, P.O. Box 2143, Westfield,  
NJ 07091, (908) 575-0550; Ray Chase,  
enrprn@erols.com

Photos by Ray Chase

(Ray Chase, 1350 Marlborough Ave., Plainfield,  
NJ 07060. E-mail: enrprn@erols.com)

## Arner Radio Auction # 3 Mahoning, Pennsylvania — March 21, 1998

CONTRIBUTED BY RAY CHASE

The third in a series of four auctions to dispose of the radios from the estate of Joseph Kanuski was held by Robert A. Arner, Auctioneer at the Mahoning Valley Fire Co. Hall in Mahoning, Pennsylvania, at 9:00 A.M. on Saturday, March 21, 1998. As in the previous auctions, the radio gear was mixed in with the regular auction goods, a plan which seemed to satisfy all who came.

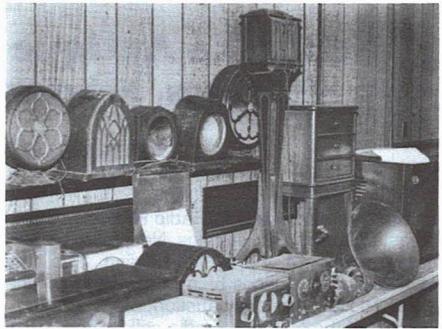
The preview was only an hour and a half before the auction, but the items were well laid out so the time was adequate. Almost everything was in as-found condition with no apparent restoration or repair work. There was a large quantity of '50s and '60s run-of-the-mill plastic radios, which I have not itemized. In quantity, 101 of these radios sold in lots of two or three each for a total of \$474 or about \$4.70 each.

There were a few good items. A Graybar 320 is ordinarily a common early AC set, but this one was in a unique cabinet with built in speaker, and the condition was like-new, discounting the years of dust inside. It drew a final bid of \$240. Also, one parts box contained the panel and guts of an early crystal set that I could not identify, but it looked like military equipment from World War I. It may have been marked "Emergency" or something like that. Its beat up lower case was sold in another miscellaneous lot. The panel and internal parts sold for \$210.

The most expensive item was a very nice Saal speaker, about 3 feet tall in very good condition, selling for \$440. There was no buyer's premium, so prices listed are actual prices paid. The auction concluded at about 1:45 P.M. The final auction of radios from this estate will be held in mid April at this same location.

e=excellent, vg=very good, g=good, f=fair, p=poor, unk=unknown, WT=with tubes, NT=no tubes

Admiral table TV, large, '50s, g ..... \$2
American Bosch 360 console, 7-tube, f ..... 45
Atwater Kent 36, NT, f ..... 30



The Saal pedestal type speaker, selling at \$440, and the Stewart-Warner end table stand out among a variety of radios and speakers.

Atwater Kent 40, f..... 32
Crosley Showbox, outside g ..... 30
Crystal set panel, guts in box of parts, unk .. 210
El Royce table, wood, early AC, g ..... 27
Emerson, wood, 3 knobs, '30s or '40s, f ..... 25
Fada portable, plastic, flip-up front, p ..... 22
Freshman console early AC set, NT, p ..... 45
Freshman Masterpiece, 3 dialer , WT ..... 45
Frost Minton, metal case, 4 tubes, AC, f ..... 75
Graybar 320 low console, w/doors and built-in speaker, AC set, vg ..... 240
Grebe Synchronphase, WT, vg ..... 170
Hallcrafters S38, g ..... 26
Knight Span Master regenerative receiver w/headphones, g ..... 20
Military TV-7 tube tester, (2), g ..... 40, 44
Motorola red small plastic portable, '50s, f-g .. 27
Peerless cathedral speaker, g ..... 37
Philco radio/phono console, ..... 26
Philco Transitone, vg ..... 17
Philco wood, f, and GE plastic, g ..... 30

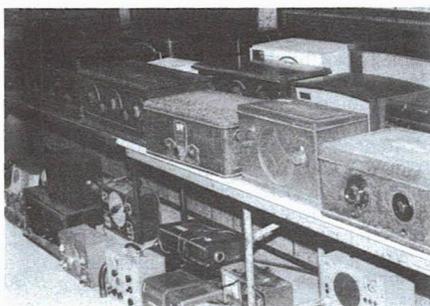
(Continued on following page)

(Arner Auction, continued)

Pilot table, wood, large, 4 knobs .....	26
RCA 45 record player, g .....	13
RCA table, wood case, 2 knobs, '40s, g .....	14
Saal floor speaker, about 3 feet tall, e .....	440
Silvertone console, 5 knobs, push buttons .....	10
Silvertone Neutrodial 3 dialer, vg .....	65
Sky Rover 8-tube early AC set .....	45
Stewart Warner, 3 dialer, WT, some extra tubes inside, g .....	85
Stewart Warner, small end table w/radio, front panel pulls down, 4 knobs, push buttons, g ...	120
Tube(s): WE 216A, (2); 50 S-type, (1); 45, S Type, (12); 80, (several), all with good filaments. ....	250
Tube(s.): big pin, early AC types, (50-75) .....	37
Zenith brown plastic, upside down chassis, vg ..	60
Zenith table, black dial, wood, '40s, p .....	30

Photos by Ray Chase

Robert A. Arner, Pine Hill Rd., Route 2, Box 216,  
New Ringgold, PA 17960-9407. (717) 386-4586



Three early AC radios in metal cases from left to right: a Crosley Showbox, a Frost Minton, and an Atwater Kent 40.

(Ray Chase, 1350 Marlborough Ave., Plainfield,  
NJ 07060. E-mail: enrprn@erols.com)

## Nebraska Antique Radio Club Auction Hastings, Nebraska — March 14, 1998

CONTRIBUTED BY STEVE MORTON

The Nebraska Antique Radio Club held an estate auction at Hastings, Nebraska, on Saturday, March 14, 1998. The bidding was very spirited and the prices high in the hands of the Adler Auction Company auctioneers.

Most of the Nebraska radio collectors were in attendance; Lincoln, Omaha, and Grand Island were especially well represented. The event was a great opportunity to renew contacts and enjoy the fellowship of this common interest.

Most sets were in as-found condition and held a full complement of tubes. Only a few were described as in "working condition." Phonographs drew the highest bids: a Duplex phonograph with two horns in very good condition selling at \$1,745, a Victor Type G at \$850; and an Edison Standard with blue horn at \$400.

A select list of items is listed below. Prices have been rounded down to the nearest dollar.

e=excellent, vg=very good, g=good, f=fair, p=poor, wk=works

Atwater Kent 20 .....	\$50
Atwater Kent 30, vg .....	70
Atwater Kent 35 .....	35
Atwater Kent 52 console, g .....	100
Atwater Kent 70 console, g .....	40
Atwater Kent 84, vg .....	275
Atwater Kent 145, vg .....	100
Atwater Kent Model H speaker .....	70
Brunswick Parisian portable phonograph, wk ..	50
Clapp Eastham Type HR, cracked .....	145
Crosley 51 .....	140
Crosley Type D speaker .....	25

Crystal sets, (2) .....	110, 175
Dictogrand speaker .....	110
Duplex phonograph, dual horns (2), vg .....	1,745
Edison Standard phonograph, w/blue horn, g ..	400
Grunow 4B, wk, g .....	160
Heathkit TC-2 tube tester .....	10
Lafayette radio .....	80
Magnavox combination speaker, vg .....	200
Metrodyne single-dial, e .....	130
Midget cone speaker in box .....	75
Motorola portable, flip-front, vg .....	20
Philco Junior, wk, vg .....	160
Philco rollout portable, (2) .....	25
Phonograph cylinder records, (box) .....	25
Precision 912 tube tester .....	7
RCA "Sunrise Grille" .....	55
RCA Radiola 18, no hood, g .....	40
RCA Radiola 21 .....	30
RCA Radiola 60, g .....	60
RCA Radiola III, w/book and WD-11 (2) .....	90
Seco tube tester .....	35
Sorber radio .....	45
Tower ship speaker, vg .....	150
Victor Type G phonograph, wk, vg .....	850
Western Electric speaker .....	40
Westinghouse H-127 portable .....	50

(Steve Morton, 905 W First, North Platte, NE 69101)

The Nebraska Antique Radio Club publishes a monthly newsletter, and holds monthly meetings and an annual auction. Dues are \$12. For more information, write to Steve Morton, Secretary, at the above address.

# COLLECTOR PROFILE

## A Visit to Play Things of Past

BY RUSSELL BARKER

The following article came to us in the form of a letter, but its subject — Gary Schneider's "Play Things of Past" — seemed to lend itself to an anniversary issue article. Gary, after all, is the founder of A.R.C., so good news about his radio enterprise on Cleveland's "Radio Row" (see A.R.C., May 1991) is welcome. We asked Gary to supply some photos, and we are amazed at the extensive inventory they reveal. No doubt more of you collectors will now find Cleveland to be a worthwhile detour on your next trip to that area. (Editor)

I recently made a visit to Gary Schneider's radio store and catalog business known as "Play Things of Past" on the west side of Cleveland, Ohio. I thought some A.R.C. readers might be interested in hearing about this neat old store and Gary's catalog business.

I have purchased radio parts via mail from Gary's catalog for the past six or seven years, and while visiting family in Akron, I decided to make a short trip to Cleveland to visit his store. The place was easy to find — one mile off Interstate 71 or 1½ miles from Interstate 90 — at 3552 W. 105th St. in a narrow building next to an old bakery.

Upon entering the store, I immediately thought I was back in time in a store along the old "Radio Row" in New York City. There are three long aisles filled from floor to ceiling with old battery radios, radio parts, vacuum tubes, speakers, speaker horns, crystal radio parts, loop antennas, radio advertisement signs, etc., all from the 1920s to the 1950s.

Gary has a small office in the rear of the store, but operates the catalog business from the lower level basement. There every inch of the walls is filled with radio parts in boxes, all carefully cataloged for easy reference and access.

Gary operates the business all on his own. Twelve hours is the usual workday — a time-consuming business venture, but a labor of love, as well.

After only a short visit, I left with several nice



One of the larger items shown here is the 1946 Seeburg "Trashcan" jukebox.

purchases to add to my small radio collection. I found a Magnavox M-3 horn speaker, an early Murdock enclosed tuning condenser that I've been trying to find for a long time, a complete set of Victoreen coils for an early battery superheterodyne project, and a very nice Fiat loop antenna.

I highly recommend that any A.R.C. subscriber or radio buff passing through Cleveland stop and visit Play Things of Past. I am sure you will be as pleasantly surprised as I was, and maybe you will run across that old radio-related item you've been searching for but just can't seem to put your hands on.

Gary is at the store most days, but be sure to call ahead at (216) 251-3714. The mail address is Play Things of Past, 9511 Sunrise Blvd., #J23, Cleveland, OH 44133. The latest catalog (#7) is available and is profiled in *Radio Miscellanea*.

Other interesting "Radio Row" shops along Cleveland's West 105th St. are Dan and Pat Szablewski's *Vintage TV & Radio* at #3498 and Bob Dobush's *Timeless Electronics* at #3554. (Editor)

(Russell Barker, 28 Franklin St., Holliston, MA 01746)



Inside Gary's store is seen a 1938 Philco Model 38-7XX, the "No Squat — No Stoop — No Squint" console, a Victor disc phonograph with an Edison Cynet horn, amongst other interesting items.



A display of toy microphones, a Zenith big black dial console, a 1931 Westinghouse Columaire, and a Philco Grandfather clock radio.

# WITH THE COLLECTORS

## Three Versions of Rider's *Perpetual Trouble Shooter's Manual, Volume I*

BY CHARLES C. KIRSTEN

We commend Charles Kirsten's efforts to unravel the intricate paths followed by John Rider in developing and refining his earliest "Perpetual Trouble Shooter's Manuals." Rider published his first volume of radio schematic diagrams in May 1931. Although this publication's title is "1931 Trouble Shooter's Manual," it was not until his second version, published in November 1931, that Rider actually identified his manual as "Volume I." A third version of "Volume I," published in November 1933, followed the format of Rider's "Volume III." Read on to further your understanding of Rider's historic volumes. (Editor)

As a young novice repairing radios in 1936, I found that the abridged Rider manual (Volumes I-V) sometimes lacked the data I needed. Early on, I knew without a doubt that only the regular Rider volumes had schematics for all the sets ever built.

In 1976, I found a set of five *Official Radio Service Manuals* by Gernsback for the years 1931 through 1935. When I took them home and compared them to the same years of the Rider manuals, I was dumbfounded — the Gernsback manuals had schematics not contained in the Rider volumes! So much for what I knew. I had learned that Rider manuals don't cover all the sets.

After 20 years of collecting, I now find in my library three versions of Rider's *Perpetual Trouble Shooter's Manual, Volume I*, and two versions of Rider's *Perpetual Trouble Shooter's Manual, Volume II*. The binder cover of Rider's "Perpetual Trouble Shooter's Manual" from November 1933 appears as Figure 1. Recently, I took time to review the three versions of *Volume I* and document some of their similarities and differences.

The differences in total page count and number of manufacturers between editions don't reveal the differences of content and quality which seemed to evolve as the dynamics of Rider's relationship with the various manufacturers changed over time. My objective in this article is to describe generally the contents of each edition of the volumes and the differences between editions. I also make some inquiry into the factors and motivations which may have dictated the editing actions and decisions of John Rider.

With the exception of his very first 1931 volume, John F. Rider never put a date on his early manuals, thus, making it very difficult to date

them. The dates shown below are the probable time of publication of the manuals inferred from the formats used in the different versions, and from the volume introductions, which refer to the sequence of publication of some volumes:

DATE	EDITION
May 1931	Original
Nov. 1931	Volume I Revised and Expanded
Nov. 15, 1933	Volume I, Revised to Volume III format
June 1932	Volume II
May 1933	Volume III
Nov. 15 1933	Volume II, Revised

Since this article is limited to the genesis and evolution of the first volume of Rider's manuals, other volumes are mentioned only as they influenced *Volume I*. The discussion follows the sequence in which the *Volume I* editions were compiled and published.

### THE 1931 TROUBLE SHOOTER'S MANUAL

This is the very first *Trouble Shooter's Manual*. The year "1931" is imprinted on the front cover, on the spine of the volume, and on the title page. [A search of the A.R.C. library revealed two different binders for the 1931 Rider manuals. One binder uses "Perpetual" in its imprinted title. Another binder does not include the word "Perpetual," but the date, "1931," appears in its place.]

The title page of this original issue manual is shown in Figure 2. Some printings of this manual did not contain the copyright statement or the "Printed in U. S. A."

A 98-page article on "Modern Trouble Shooting" in the front of the book is numbered in uppercase Roman numerals from I to XCVIII. This section is followed by 804 pages of schematic diagrams numbered in unbroken sequential Arabic numerals.

This manual is one of only three volumes that used the 3-post Swivelok black binder. The "Swiveloks" are individual flat swing latches for each of the posts. An upper part of each post may be screwed up or down to change the length of the posts. A diagram and instructions for using the

Swivelok appear on the inside front cover. All pages are 3-hole punched, unlike the later 4-post, Slide-Lock binder which requires two more holes half-way between the usual 3 holes.

The Swivelok binder was used on Rider's first 3 manuals which were all published by the Radio Treatise Company of New York. All volumes appearing in 1933 and later used the Slide-Lock binder and were published by John F. Rider.

In this 1931 volume, some schematics for small manufacturers seem more finished than the relatively crude drawings usual to small companies. This might be explained by the references to *Radio News*, *Radio World*, etc., in Rider's introduction, giving them credit for allowing him to take whatever material he found in their magazines for use in his manual.

From the contents in Rider's first release of the 1931 volume, there is evidence that some companies were not giving him data. When he approached companies such as Ozarka, Stewart-Warner, and DeForest, proposing that he take copies of their proprietary schematics and sell them to the public, he must have received varying degrees of hostility. Such companies had strong franchises with their dealers and tended toward secrecy about their products. In many cases, Rider was probably shown to the door.

But John Rider had a vision, which he expresses very well in his introduction to the 1931 edition: "It may be of interest to the man who thumbs these pages to know that it is the fulfillment of an ideal. We had hoped for a long time to prepare a book which would contain radio service data covering American and Canadian radio receivers, with completeness as a goal [emphasis mine]."

The 1931 edition as delivered was hardly "complete." However, Rider was not only a man of vision but also he must have had charm and persistence. But, what most distinguished him was his integrity. He had promised added data

supplements to the original buyers when new material became available, and that's what he delivered. The paucity of data in the first release of the volume is in contrast to the later flood of data which he was able to send in his supplements.

The original 1931 edition was soon supplemented with data from additional manufacturers and more schematics from the manufacturers already in the manual. Some of the major companies, such as RCA, Philco and Zenith, recognized the manual as a source of free advertising for their radios and engineering. These companies competed for the most space in the Rider's manual: Zenith added 14 more pages; RCA added 15 pages and 6 more radio models, bringing to 70 the number of RCA sets in the 1931 Edition.

The advertising value must also have appealed to the small mail order radio manufacturers. My guess is that when they realized they could avoid shipping sets back to the factory for minor repair or adjustment by enabling local repairmen to do the work, they couldn't get their circuits and data to Rider fast enough. The resultant data flow must have exceeded Rider's greatest expectations.

As shown by his later supplements, the manufacturers flooded him with schematics, wiring diagrams, tube location drawings, chassis layouts, part number lists, point-to-point resistance charts, alignment adjustment locations, voltage tables, descriptions of circuit designs, and function and performance data. In his later rewrite of the 1931 edition — Volume I — RCA added an additional 30 receivers, bringing the total for RCA up to 100 radio models, which wouldn't have fitted into the original 1931 edition.

By this time, Rider himself must have felt like the sorcerer's apprentice who started a flow he couldn't control. What was to be done with this

*(Continued on following page)*

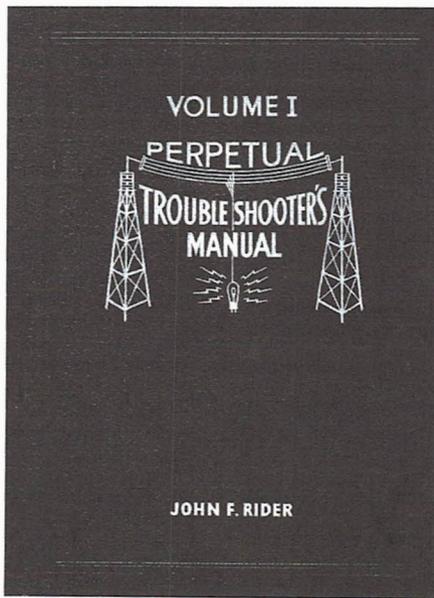


Figure 1. The cover of the "Perpetual Trouble Shooter's Manual, Volume I." This is the third version from November 1933. Earlier versions used the familiar antenna, towers, and vacuum tube with sparks design, but were otherwise quite different. For example, the original issue manual can be found with two different binders. One is similar to the third version, except that the date "1931" appears in place of "Volume I." The date also appears on the spine of the binder. On the other style of binder, the word "Perpetual" appears above the antenna wires and the date "1931" is imprinted below the name "John F. Rider" and on the spine as well.

(Three Versions of Rider's, continued)

flood of paper and information? He couldn't put it all into the book. Although the 3-post Swivelok binder had adjustable length posts and had been issued with 1,100 pages, it had a limitation of about 1,300 pages. Not much room for expansion there.

There was no way that the 1931 edition was going to hold all the material Rider was receiving on radio sets up through 1931. He had been blind-sided by his own act of including "1931" in the manual's title.

Had he been unethical, he could have issued and charged for a 1930 manual, or developed some such scheme to wiggle out of the commitment he had made in his introduction to the 1931 edition. But, he didn't do that. Something had to be done which would retain the value of the manual, keep faith with those who had trustingly bought the first issues, and at the same time keep the \$5 price for subsequent manuals.

### PERPETUAL TROUBLE SHOOTER'S MANUAL, VOLUME I, (NOVEMBER 1931)

The 1931 date on his first manual was causing him nothing but grief, so John Rider must have made a rule never again to date anything. From all evidence, he never did. If he had called his first edition "Volume I" when he began, he could have declared it complete at any time, and gone on to the next volume. As it was, if he didn't get all the circuits up through the year 1931 in this first volume very soon, he would lose face with the repairmen who depended upon his word.

Rider's solution was simple yet heroic — he revised the entire 1931 edition and renamed it "Volume I." Now he was free of the "1931" albatross. The revision must have been done hastily and on a shoestring. Apparently, to keep costs down, he adhered to the same general format of the 1931 volume. He kept the "Canadian Radios" and the "Modern Trouble Shooting" sections at the beginning of the volume, adding two pages of tube data for an additional 100 pages. All separate sections on "Power Amplifiers," "Battery Elim-

inators," "S.W. Receivers," etc., were also retained.

This version used the same sequential Arabic page numbering with added pages marked with an additional letter A, B, C, etc. However, these added pages with letters rivaled in number the Arabic-only pages. Rider solved this problem by using the manufacturers' folio format in later volumes.

Although this "Volume I" was to be expanded to the full 1,300-page limit of the Swivelok binder, there was still too much material to fit in the binder. Data was still coming in for 1931 and prior years. Now came the hard decisions! It seems obvious from the crowded pages and deleted parts lists that John Rider dealt with a firm hand as to what went in and what was left out.

This version was more crowded, often with finer print and fewer full layouts of individual sets than the 1931 edition. A few older schematics without part values or sets of little known trademarks were omitted. Schematics of better known, but obsolete sets were reduced in size, and placed with other reduced diagrams on single pages. Resistance tables, which Rider proclaimed were the tools of choice for repair diagnosis, were all but eliminated.

Part number tables were sharply reduced to show only the electrical component values. Often the manufacturer part numbers were omitted, and voltage tables were edited, and sometimes eliminated. Pictures of chassis tops and bottoms were reduced to one view, or replaced by small sketches showing a plan of the tube locations.

Everywhere economy of space was observed. All of this must have been hard on Rider — he had the data to put in the manual, but he had to decide what to leave out, and all because of the mistake of putting a year on the cover of the first volume. How painful!

Thus was born the November 1931 version of Rider's manual, — the first to be marked *Volume I*. It is readily identifiable because, like the 1931 edition, it is in a black Swivelok binder. The front cover shows the familiar "Perpetual"

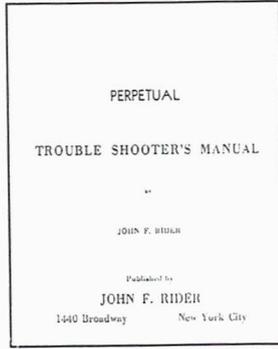
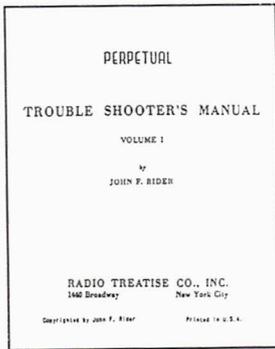
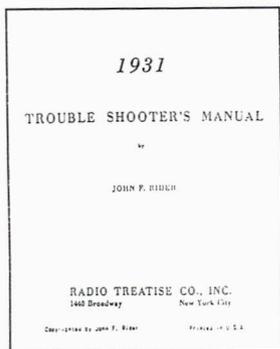


Figure 2. "Rider's Trouble Shooter's Manual" title pages: (left) The original issue, dated 1931 — inclusion of this date created a serious problem for Rider; (center) The November 1931 version with the "Volume I" identification and the word "Perpetual" substituted for the date; (right) The Volume I version of November 15, 1933. Note the absence of any volume number or date. Also, John F. Rider is shown as the publisher.

across the antenna wires between two towers, with *Trouble Shooter's Manual* between the towers. Below a radio tube are "John F. Rider" and *Volume I*. The title page shows that this manual was published by the Radio Treatise Company of New York.

Also shown in Figure 2 is the title page from the November 1931 issue. Note that this page identified the manual as *Volume I*.

The pages are numbered from 1 to 804 in uninterrupted sequence, with many pages like "24-D", "24-E", etc., added, swelling the total page count to almost 1,100. In addition there is the 100-page section by Rider about "Modern Trouble Shooting" right after the unnumbered index pages at the front.

Of the three versions of Rider's first radio manual, this is the most packed with data. Some of the early battery sets were given less space than in the 1931 edition, but what was lost in revision was made up by additions.

### PERPETUAL TROUBLESHOOTER'S MANUAL, VOLUME I (NOVEMBER 1933)

Since Rider never dated or identified these early editions, the only way to identify a volume is by its physical makeup. The 1933 edition of *Volume I* was actually published after the 1st editions of *Volume II* and *Volume III*. This 1933 version of *Volume I* was updated to the new 4-post Slide Lock binder, which has a slider the full height of the binder with slots that engage and lock to the two outermost posts of the binder. The two intermediate posts are connected by a flat metal strip which keeps them in position when the slider is closed and locked.

The binder is stamped with *Volume I* on both the front and the spine, but the title page inside does not identify the volume number. This title page, also shown in Figure 2, indicates the publisher to be John F. Rider. The foreword states that the book is printed from engravings, which improved legibility over the prior versions.

Earlier versions of *Volumes I* and *II* were updated to reflect the manufacturer's folio page format. In Rider's words in the introduction to this 3rd edition of *Volume I*:

"This issue of *Volume I* is slightly different from earlier printings. One of the changes is to be found in the method of indexing. You will note that it is the same as used in *Volumes II*, and *III* as recently issued. [June 1932 and May 1933 respectively] The reason for this change is that the method of indexing as originally introduced in *Volume III* proved so much more popular than that previously employed in *Volumes I* and *II*, that it was deemed most advantageous to establish a uniform index which would serve best over the years to come."

If Rider's *Volume III* folio method of page grouping had not been so popular, or if his old scheme hadn't been so really, really bad, it is possible that he might never have reissued his old volumes again. The new folio plan gathers each manufacturer's pages in a group, or "Folio," all marked with the same radio set maker's name. Folios are arranged in alphabetical order in the volume,

each page is numbered with the volume number in which it appears, and then a dash is followed by the sequential number of the page within the folio. Where pages are added, they are given the familiar A, B, C, etc., added to the associated page number.

In this issue of *Volume I*, all the previous sections on "Midgets," "Power Amplifiers," etc, were integrated by manufacturer into the new folio scheme. Many schematics of AC sets were added, along with additional charts for voltage and resistance, and the impression I get is one of crowding. This is probably because there are 50 fewer pages devoted to schematics compared to the first version of *Volume I*.

The battery set enthusiast will find only schematics for the most popular models of the largest manufacturers, such as the Crosley Trirdyn and Model 51, for example, and these are reduced in size and squeezed in between other schematics. Small 2- and 3-tube battery sets are scarce.

When Rider emphasized utility in editing the 3rd edition of *Volume I*, he abandoned his ideal of completeness in covering the early battery sets. There was little need for schematics of old radios which were not worth fixing, because they didn't work on house current. Instead, this edition became primarily a manual of AC sets from the late 1920s, through 1931, with auto and 32-volt farm sets added.

### EPILOGUE

It is disappointing for the archivist and early battery set collector to realize that Rider's coverage of battery sets is so incomplete. Through three editions of his very first manual, he ended up dropping or not including many early battery schematics and leaving many of them out of his final version of *Volume I*. Of the three versions of Rider's, the November 1931 issue would be my choice of the Rider manuals.

Fortunately, all three versions of the *Volume I* manual were available to me, though searching three separate manuals was never convenient. I have solved that inconvenience by copying pages from the two earlier manuals, and inserting them in the proper manufacturer's folio in the final edition. This pushes the capacity limits of the binder, and it just barely holds the extra pages without undue stress.

Use of this manual still requires three separate indexes, with strange page numbers dreamed up during those hectic days when Rider's manuals were still struggling to find their final form.

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(Charles Kirsten, Radio Relics, 15556 Sandra Lane, Sylmar, CA 91342)

Charles Kirsten is a spacecraft electronics engineer retired from the Jet Propulsion Lab in Pasadena, California. He has been repairing radios since age 12. He takes great pleasure in the beautiful jewelled meter movements and expressive speakers that give evidence of the electrical currents we can't see but try to control.



## Radio Diagram Sourcebook

By Richard Gray

REVIEWED BY RICHARD C. FOSTER

Way back when I first started collecting radios, I took a chance and bought a carload of Rider's manuals. In the end, I had two sets of I-XIV and some miscellaneous volumes. Volume I alone was worth hours. I pored over it, finding radios I'd never heard of, sure I'd never see them (but, did, in many cases years later).

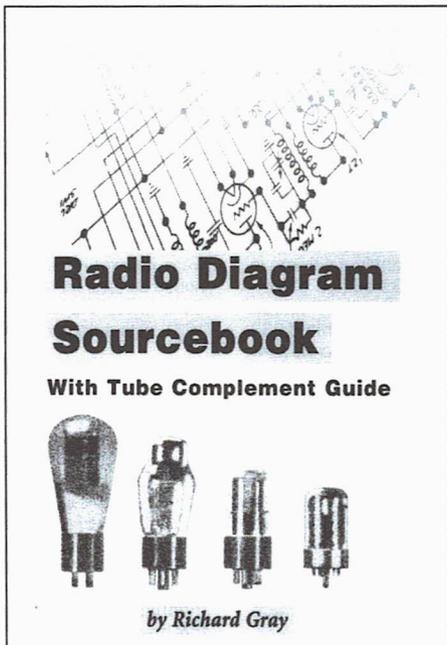
Lists, tables, and data are really fun to poke through, and my first tube complement handbook was a rare prize. Now I have shelves of books, but it's never enough. It seems that every time I go looking for one thing, I find all kinds of other surprises.

One day, I discovered the *Mallory Encyclopedia*. Heaven! If it isn't there, it probably doesn't exist. I find Mallory's most useful feature to be the row of tube complements by number, so the busy serviceman or collector can cruise through looking for, say, a 4-tube chassis with a 1-V rectifier to try to identify an unmarked chassis. Almost everything you want to know is there — the manufacturer, the model, the Mallory number for volume control, the number of tubes, the kinds used, the IF, and the Rider's reference, if there is one.

You do have to skip the volume control information, but who stocks all those Mallory parts anyway? You still have to have a list of those volume controls to get the values. The Rider's reference is a crosscheck, and the IF is something you often seem to want in a hurry. Other parts information, some useful, some not, is also included.

Is the supply of *Mallory Encyclopedias* dwindling? Has the price risen to a point that is discouraging? Are you trying to discover information about a company and the sets it made? Those who need references like this can take heart. *The Radio Diagram Sourcebook* is where to get the facts.

*The Radio Diagram Sourcebook* by Richard Gray is a reprint of the *Sylvania Complement Handbook* of 1944. It includes some neat tables



in the front, such as trade names, manufacturers, and formulas, which we used to have to get from Ghirardi and other various sources. There is quite a nice overview of service literature included as well.

I always find something interesting in this book that I didn't know from the works of other writers, and I have learned things I didn't know about service literature. If you want to know all about the various editions of the big manuals and what companies put out separate manuals, you'll find the information here.

Gray's *Sourcebook* is similar to Mallory's in its clear, easy-to-read format. No volume controls here, but the IFs are listed. The introduction tells you how to accomplish an ID and some of

the pitfalls involved.

The book helps you to determine the identity of a missing tube and one unknown IF, and to try to identify a chassis by number of tubes or tube complement. Two drawbacks are the lack of a Rider's reference and the publication date of 1944. In trying to locate diagrams for French collectors, I've found that a lot of the tough ones are between 1948 and 1955. Mallory goes to 1948, Sylvania to 1944.

For prewar radios, this book is a very fine reference and one which any serious collector should have, along with Rider's and Mallory's. In addition, you get all the dope of the publication dates of Rider's volumes and the Gernsback manuals. Gray's book is new to me and will be near my workbench from now on.

Gray's *Sourcebook* is a handy format (6" x 9") and a good value at \$18.95. It may be ordered from A.R.C. and other A.R.C. advertisers. Be sure to check them for shipping arrangements.

(Richard C. Foster, 12 Shawmut Ave., Cohituate, MA 01778)

# The Locator

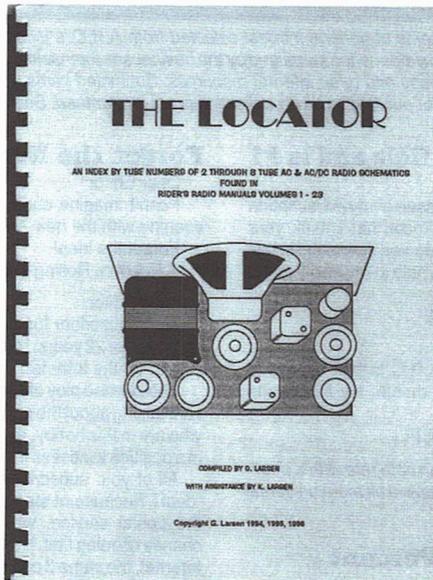
## By G. Larsen

REVIEWED BY RICHARD C. FOSTER

Another good reference is G. Larsen's *The Locator*, which covers 2-through 8-tube AC and AC/DC sets in Rider's I-XXIII, with a supplement for Volume I at the end. This 8 1/2" x 11" volume proceeds some-what in the manner of the old tube socket guide with vertical tables that make you turn the book sideways. The tables are arranged in the following order: output tube, rectifier, RF, mixer, IF, 2nd detector, etc., except for TRFs.

The pages are grouped by number of tubes so that if you have a 5-tube set, you go quickly to the "5" section and scan that. You don't have to go through all the numbers in Mallory, which can be a real chore in the case of an Emerson or Wells-Gardner, even if you find delightful surprises along the way.

*The Locator* provides the manufacturer, the Rider's reference, the filter capacitors, and the power used, as well as the story on ballast tubes and line-cord resistors. One omission is the model number, which you then have to look up in Rider's. Unlike any of the other books I have, this one goes all the way to 1954, since it covers Volume XXIII of Rider's. It is a boon for collectors because so many have sets of Rider manuals.



*The Locator* seems to assume that you have the chassis in front of you. Therefore, its perusal value for an evening's entertainment is less than that of other books, but as a tool, it is most useful. As a reference it is right up there with Mallory, except that it goes only to 8-tube sets and doesn't give the model numbers. It must cover 80 or more percent of radios, but skips Philco 90s, Scott radios, or monsters by Emerson, Midwest, Ward's, etc. Restricted to sets in Rider's, it skips the additional sets not in Rider's that appear in Gernsback and Mallory. We don't see those sets very often anyway, and as far as my experience goes, 99 percent of those have 4 or 5 tubes.

Surely someday someone will scan all this stuff into a computer and we'll all have virtual reality helmets with all the known references in the solar system. For now, books like *The Locator* and *Radio Diagram Sourcebook* are a great supplement to your reference library.

*The Locator* is available at \$14.95, including shipping, from the author, G. Larsen, 7841 W. Elmgrove Dr., Elmwood Park, IL 60707.

(Richard C. Foster, 12 Shawmut Ave., Cohituate, MA 01778)

## Another Ekco Teapot

BY ROBERT J. GOAD

After reading the March 1998 A.R.C. article by Gérard Faassen about the Ekco teapot, which looks like an Ekco AD-65, I thought your readers might be interested in another version of the same teapot. This one is hand-painted in a burl walnut design. It was manufactured by Swineside Ceramics in Wensleydale, Yorkshire, England, up until about 10 years ago.

Note that the lid is a cat with one eye open. I wonder if the original teapot had the same type of lid. The Faassen teapot has no such lid, and if it has a dial, it's not really visible in the photo. The two differ, but aim to be replicas of the AD-65, except for the one-eyed cat, of course.

This teapot is part of my collection of radio-related items, which include match books, spoons, knives, postcards, etc.

(Robert J. Goad, 8441 Flagstone Dr., Tampa, FL 33615-4915)



This ceramic teapot, hand-painted to simulate burl walnut, is a replica of the Ekco AD-65, except for its cat lid. Compare it to the teapot advertising gimmick on page 9 of the March 1998 A.R.C.



# RADIO MISCELLANEA

"Radio Miscellanea" includes items of general interest selected from A.R.C.'s incoming correspondence. "In The Marketplace" items are based on information submitted by the businesses themselves. "From The Internet" items are obtained from internet newsgroups and other internet resources. Submitted items should be verified for accuracy; items may be edited by A.R.C. for publication, and publication is not guaranteed. See the masthead for more details.

## A.R.C. Fills Florida Hole and Is # 1

Dear Editor:

I have just received my first issue of my subscription to A.R.C., and I want you to know that I think your publication is just great. There are very few clubs in this area in Florida, and you fill a big hole in my ability to get radios and parts.

Alex Kaplan, Boca Raton, FL

Dear Editor:

Would like you to know that A.R.C. is the #1 item that I look for in the mailbox every month. My #2 favorite magazine is *Playboy*.

Robert Gardner, Fort Pierce, FL

*Good to know that A.R.C. can compete with a publication reputed to emphasize a topic a bit more universal than radio. (Editor)*

## April Fooled 100 Percent

Dear Editor:

Your April Fool cover fooled me 100 percent. I should have suspected.

I still laugh when I think how you fooled me with the "Crosley Dog" article a few Aprils ago. Next April, I'll assume the entire contents of the the issue is a goof unless proven otherwise.

Fred Kaepffel, Shaker Heights, OH

*Other readers may also remember the "Crosley Dog," a creation of Dan Merz, whose article in the April 1991 A.R.C. set many folks up to believe that this "prototype" was never produced "because of tube shortages and patent violations." Obviously a memorable and enjoyable ruse! (Editor)*

## Ad Guidelines for Battery Sets

Dear Editor:

I have a question regarding advertising 1920s battery-operated radios. Do you believe that an ad should state that a radio of the 1920s vintage has no speaker or tubes? Various radio-collecting guides say that the convention is that, when the value of a radio is stated, the fact that it has no speaker or tubes is understood.

What are A.R.C.'s guidelines on this? You may have guessed that I have had a problem regarding this issue.

I greatly enjoy your publication — it is invaluable!  
Mike Itzo, St. Pete Beach, FL

*Most early battery sets are sold without a speaker, since speakers were usually separate units (and not always made by the same manufacturer as the radio). Some early battery sets had "built-in" speakers. Unless "with speaker" appears in the ad, you should assume that early battery sets are without speakers.*

*Regarding tubes, the situation is less clear. It is a good idea to state specifically "WT" or "NT," as we do in auction reports whenever possible. (Editor)*

## Forget the Net!

Dear Editor:

I can't imagine curling up in my easy chair for an evening with the new A.R.C. via a computer!!

Forget the idea!

E.E. Lohn, Rolling Hills, CA

Dear Editor:

As a subscriber for about 10 years and a computer engineer for 22 years, I am shocked at the tack of putting A.R.C. on the Internet.

The idea is a ploy of what I call "the rich and powerful." I am talking about the corporations and full-time dealers who are in this hobby, along with the collectors who are in a position to access the Internet at any time of the day.

All of your subscribers are looking for that special "deal." Because of staggered mailings and delivery by the postal service, we all have a somewhat equal chance of being first. If the "For Sale" ads are put on the Internet, the same 3 or 4 percent of collectors would get all the deals. Some full-time dealers can access the Internet all day long, while employees of international corporations can access the Net 24 hours a day.

The average collector who works on an assembly line can't access the Internet during his work hours. By the time he gets home and can check a computer, the deals are gone. He doesn't have a chance.

Don't let the corporations and full-time dealers control the hobby. Keep the "For Sale" ads off the Internet at least until about three weeks after the issue of A.R.C. is mailed.

Sam Hevener, Richfield, OH

*Thanks for the comments. A.R.C.'s current Internet web site ([www.antiqueradio.com](http://www.antiqueradio.com)) contains a selection from our editorial pages, coming radio events, and links to over 250 related web sites — but, no ads. Orders can be placed for subscriptions, books and free samples. Nearly 25 percent of our mail is now e-mail! (Editor)*

## In the Marketplace

Gary Schneider's Play Things of Past Catalog #7 is now available. This is the largest edition yet at 116 pages and over 13,000 separate items, some of which are illustrated. Many are vintage, one-of-a-kind items.

The user-friendly index will guide you into one of six basic sections: transformers, tubes, parts, literature, books, and magazines. There are 2,100 listings of transformers; hundreds of vacuum tubes and tube-related items; thousands of parts, from binding posts to Waldom speaker cones; and a broad range of manuals, catalogs, books and magazines.

Catalog #7 can be ordered by mail for \$6 from Gary B. Schneider, Play Things of Past, 9511-23 Sunrise Blvd., #J23, Cleveland, OH 44133.

# CLASSIFIED ADVERTISING POLICY

**ONE FREE 20-WORD AD** for subscribers in each issue; additional words are 29¢ each. See details below. Classified ads sent by mail, fax or by any other method must be received (not just postmarked!) by **Noon Eastern Time** on the classified ad deadline date to guarantee inclusion in the current issue. Late ads are held for the following issue. Please enclose correct payment with all ads. Stamps or cash are OK for small amounts. (Canadian and other foreign advertisers, please see "Payment" on page 2 for methods.) "Free words" cannot be accumulated from month to month; free words must be requested when ad is submitted.

**Faxed & e-mailed ads: Please see additional information on the inside front cover.**

**When including ads with other A.R.C. correspondence, write the ads on a separate piece of paper.** Include SUB# with ad. Ads may be sent in advance; but, write each ad on a separate piece of paper and indicate the month (or successive two months) you want the ad to run.

**To minimize our typing errors: Please write legibly.** Use both capital and small letters. Do not use a dash between words. Carefully write the following numbers and letters (especially in model numbers) since some can look alike; for example 1, I and l (the number one, the capital i and the small L.) Also: 0, O, o, Q and D; r and n; 6, b and G; V, U, u, v and Y; A and R; 5, S and s; 2, Z and z. We try to correct spelling errors, so when using an uncommon word or manufacturer which we might mistake as a more common word or manufacturer, note it so that we do not "correct" it. Editor's annotations are in [brackets].

**Advertising is accepted only for early items related to radio, communication, etc. All items must be described fairly; reproductions, reprints and not-original items must be so identified. Advertisers must agree to respond promptly to inquiries and orders, to resolve problems promptly if the buyer is not satisfied, and to comply with a buyer's refund request on unaltered returned items.**

The publisher reserves the right to edit ads without notification to the advertiser and to reject ads for any reason. Names other than the advertiser will be edited out of ads. Ads with non-radio-related items will be returned or edited unless the non-radio-related items are for trade of radio-related items, or they are incidental to and appear at the end of an otherwise acceptable ad. The publisher is not responsible for errors due to illegibly written ads or for any other reason.

**Clubs:** Since club activities receive free coverage on the *Coming Radio Events* pages, the free 20 words may not be used for club activity ads. See inside front cover for additional information.

## CLASSIFIED AD DETAILS

**Deadline: NOON ET— 10th of the month!**

Classified ads must have a standard heading such as **WANTED, FOR SALE, FOR TRADE, FOR SALE/TRADE, SERVICES, MESSAGE, HELP, AUCTION, MEET**, etc. This heading is the only bold or all-capitalized words allowed in the ad. Capitalize only manufacturer names, model names, etc. This standard ad format makes scanning the ads easier.

Before writing your ad, please look over the ads in a recent issue of A.R.C., and try to write your ad in the same style. Full name (or company name) and address is required in all classified ads; we will add it if you forget.

To encourage varied content of the ads, the same classified ad may be run only once per issue and for only two consecutive months. (To run an ad longer, use a boxed classified or display ad.)

### Classified Ad Rates per Month

Subscribers:

First 20 words: **FREE\***

29¢ per word for extra words over 20 **plus**

10¢ per word for a shaded ad (count all words including free words).

\* Subscribers may take 20 free words on only **one** ad each month.

Non-Subscribers:

47¢ per word **plus**

10¢ per word for shaded ad.

Please do not forget to send in the extra 29¢ per word when your classified ad runs over the free 20 words; your payment will be appreciated, and it will help to keep A.R.C. healthy.

## BOXED CLASSIFIED AD DETAILS

**Deadline: 1st of the month!**

Boxed classified ads can run unchanged for three months or more. No words are free. Ads may be shaded and may include bold and all-capitalized words freely. The ad need not begin with "For Sale," etc. Minimum run is 3 months, prepaid. Discount: 10% for 6 months; 20% for 12 months.

### Boxed Classified Ad Rates per Month

Nonshaded ads:

40¢ per word for all words,\* none free, **plus**

10¢ per word for each bold word **plus**

10¢ per word for each all-caps word.

Shaded Ads (All words are bold at no charge):

50¢ per word for all words\* **plus**

10¢ per word for each all-caps word.

Non-Subscribers:

Add 20¢ per word to above costs.

\*Three words can be bold-all-caps at no extra charge.

## PHOTO & DRAWING DETAILS

**Deadline: 1st of the month**

**for all ads with drawings or photos!**

Drawings and photos are encouraged as the response to your ad is much larger and the reader knows better what you want or are selling. Send in your drawing or photograph, and A.R.C. will reduce it or enlarge it as needed.

### Photo and Drawing Rates per Month

\$23.00 per month for each photo or drawing

(If ad is canceled, this amount cannot always be refunded.)

## CHANGES & CANCELLATIONS

Please check your ads carefully before sending them in. Once ads are received, it is not always possible to refund the amount sent, pull the ad or make changes.

## IMPORTANT — COUNTING WORDS — IMPORTANT

The **standard headings**: WANTED, FOR SALE, etc., count as **one word** each time used in an ad. **Name, address** and (one) **telephone number**, count as **6 words**, regardless of length. Ham call letters and business name can be included in the 6 words and do not count extra. Full name (or company name) and address is required in all classified ads. Each additional word, abbreviation, model number or number group, extra telephone numbers, fax, e-mail, etc. count as one word each. Hyphenated words count as two words.



PERIODICALS

A.R.C., P.O. Box 2, CARLISLE, MA 01741  
ADDRESS SERVICE REQUESTED

**CLASSIFIED AD  
DEADLINE JUNE 10th  
Noon Eastern Time**