



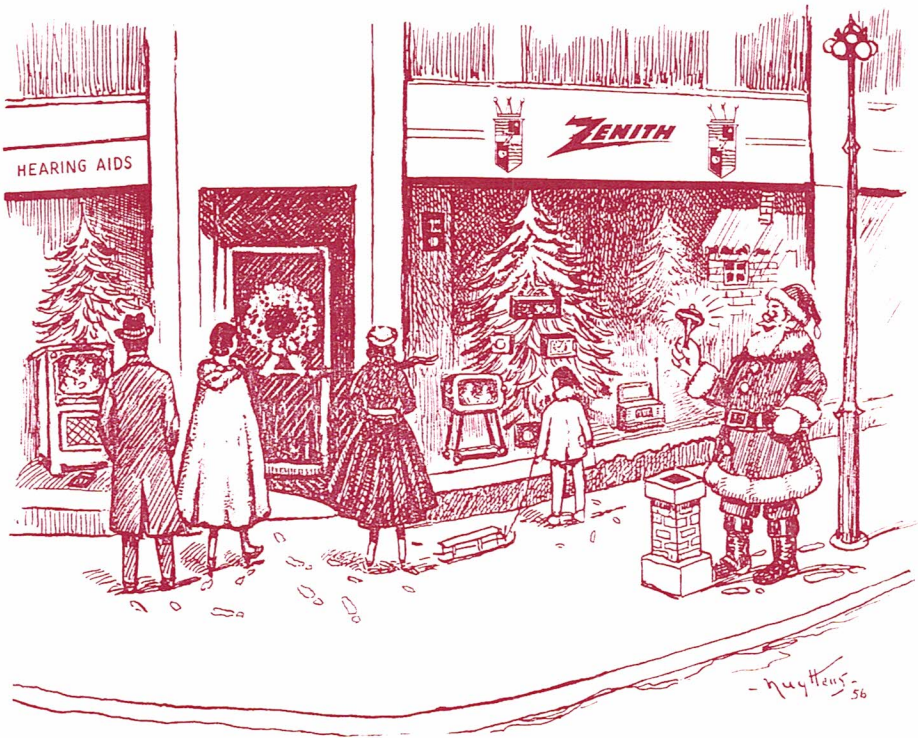
ANTIQUE RADIO CLASSIFIED



VOLUME 14

DECEMBER 1997

NUMBER 12



TO WISH YOU GREETINGS OF THE HOLIDAY
SEASON AND HAPPINESS IN THE NEW YEAR

E. F. McDonald, Jr.

PRESIDENT, ZENITH RADIO CORPORATION

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: (508) 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 \$38.95 by Periodicals mail and \$55.95 by First Class mail.

Annual foreign rates. By air: Canada - \$59.00; Mexico - \$65.00; Other foreign countries - \$100.00. Surface mail: Canada - \$49.00; Other foreign countries - \$55.00. (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.

© Copyright 1997 by John V. Terrey.

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

Printed in U.S.A.

STAFF:

Publisher and Editor: John V. Terrey
Production Manager: Scott J. Young
Advertising Manager: Cindie P. Bryan
Managing Editor: Dorothy Schecter
Publishing & Editorial Staff: Ray Bintliff, Dave Crocker, Dick Desjarlais, Bobby Lyman, Jean Melondian
Founding Publisher/Editor: Gary B. Schneider
Contributing Writers: Mike Adams, Richard L. Arnold, Ray Bintliff, Ron Boucher, Paul J. Bourbin, Norman S. Braithwaite, Dave Crocker, Alan S. Douglas, Richard C. Foster, Fred Geer, Jim Kreuzer, Ron Ramirez, Henry Rogers, Ian L. Sanders, Gary B. Schneider, Daniel Schoo, Dwane Stevens, Frank R. White, Ralph Williams

PURPOSE. *Antique Radio Classified* is published for people involved in the radio collecting hobby. Its purpose is to stimulate growth of the hobby through the buying, selling and trading of radios and related items, and to provide a monthly forum for the interchange of ideas and information.

CONTACTING ANTIQUE RADIO CLASSIFIED. All correspondence should be sent to:

A.R.C., P.O. Box 2, Carlisle, MA 01741.

Only UPS, Federal, etc. items to street address: *One River Road.*

Telephone: (508) 371-0512; Fax: (508) 371-7129

E-mail: ARC@antiqueradio.com - Web: www.antiqueradio.com

Please, no classified ads by telephone; thanks.

Your ads, renewals, letters, etc. can be handled faster and more efficiently if your name, address and SUB# are written on each.

Unfortunately, A.R.C. is not staffed to answer letters with questions about antique radios or requests for advice. However, A.R.C. does solicit letters of interest to its readers and publishes them as space permits. A.R.C. assumes that permission is given to edit and to publish all correspondence and articles received unless otherwise indicated.

GUARANTEE. You may cancel your subscription at any time and receive a pro rata refund for issues not yet mailed. If errors to ads are made by A.R.C., upon request a free correction will be run in the next available issue.

PAYMENT. Please send in full payment with your order or ad. A.R.C. does not carry accounts; all subscriptions, ads, etc. must be prepaid (except for the 6 and 12 month display ads indicated below). Pay in U.S. funds. Checks drawn on a U.S. bank, money orders, VISA or MasterCard (\$10.00 min.) are preferred. Make check out to "A.R.C." U.S. stamps or cash are OK for small amounts. Canadian payers may send a Canadian check but specify U.S. funds. Subscriptions will be prorated to amount sent if amount is incorrect.

FAX & E-MAIL PROCEDURES/PAYMENT. Subscriptions, book orders, classified ads, display ads, etc. are welcome by fax or e-mail. Deadlines are the same as for ads received by mail. Please calculate the amount due. Payment by VISA or MasterCard is preferred if your order is over \$10. If under \$10, or if you prefer to send a check or money order, state the amount being sent and that the payment is in the mail. Do not send another copy of your ad with your payment; simply indicate that it is a fax or e-mail payment. If you want confirmation of our receipt of your fax, call immediately after sending your fax.

CHANGE OF ADDRESS. Please notify us 4 weeks in advance of a change of address. Send both your new and old addresses, and include your SUB# and effective date of your new address. Temporary address changes can be made also.

SUBMISSION OF MATERIAL. *Antique Radio Classified* welcomes and solicits information that pertains or relates to radio history or collecting. This may include articles, book reviews, photos, information on upcoming radio events, meetings, antique radio organizations, radio auctions, sources of old radio and restoration supplies, and other related and interesting material. All material submitted should be carefully researched, typed and accompanied by good photos, if appropriate. Computer disks are appreciated. Writing guidelines are available upon request. Unless prior arrangements are made, all submitted materials may be edited, become the property of *Antique Radio Classified* and will not be returned. Publication is subject to approval by A.R.C. and to time and space constraints.

MAILING OF ISSUES. U.S. subscribers can receive A.R.C. by First Class or Periodicals mail (Periodicals is the way most magazines are mailed). The mailing of First Class copies is staggered with faraway copies mailed before local copies. Non-U.S. copies are mailed on the first day. Periodicals copies are mailed on the last day. Mailing dates change each month, but mailing is usually completed by the 27th of the month. First Class copies usually are received by the 5th of the month; copies by Periodicals mail, by the 10th.

ETHICS. No person involved in the production of A.R.C. is to act on any information in the magazine until the first delivery day after local copies are mailed.

DISCLAIMER. The publisher is not responsible for any buying and selling transactions incurred, or for any other use of the contents of this publication.

Antique Radio Classified subscription rates, frequency of publication, content, policies, size and ad details, and rates are subject to change at any time by A.R.C.

DISPLAY AND BUSINESS CARD ADS - DETAILS AND RATES

The deadline is the first of the month for display and business card ad artwork, payment and repeat requests.

Advertising is accepted only for early items related to radio, communication, etc. All items must be described fairly; reproductions, reprints and non-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.

Advertising must be prepaid, except as noted below; see "Payment" paragraph above for details. Late ads will be run only if space and time permit. Since artwork is reduced to 63% in the printing process, originals must be the artwork size listed below. Do not send in artwork on art board or send negatives. Ads should be typeset or typed neatly with a carbon ribbon, black ink (not pencil) on white. If used, reverse type must be limited to 25% of the ad. If you want us to prepare your ad, include the one-time cost below for A.R.C. to make up the ad.

Photos should be at an 85-line screen; otherwise, add \$15.00 per photo for screening. Do not cut or trim photos or glue photos to artwork; submit separately.

If you are confused by these requirements and terms, please

contact A.R.C. before beginning to prepare your ad. We will be happy to advise you on your ad ideas, estimate how much the ad will cost, recommend an ad size, etc.

We assume that advertisers want all ads which are submitted to run without delay; therefore, we will run the ad and bill for any additional work required for the ad to meet these specifications. A late ad will run beginning with the next month. "Tear sheets" will be sent only for 1/8-page or larger ads and only if requested when the ad is submitted.

First business card per advertiser is at lower rate.

The 3-month rates represent about an 11% discount, the 6-month rates 23%, the 12-month rates 30%. Placement requests: add 15% but call first. Clubs: write for discount policy.

Page	ARTWORK SIZE (SEND IN THIS SIZE)		As Printed (size in magazine)		Cost for 1-month	Cost for 3-months	Cost for 6-months*	Cost for 12-months**	One Time to make up Ad
	H x W (inches)	H x W (inches)	H x W (inches)	H x W (inches)					
Full	12 7/16 x 7 1/2	7 3/4 x 4 3/4	3 5/16 x 4 3/4	3 5/16 x 4 3/4	\$269.00	\$719.00	\$1239.00*	\$2159.00**	\$69.00*
1/2 H	5 1/4 x 7 1/2	3 5/16 x 4 3/4	3 5/16 x 4 3/4	3 5/16 x 4 3/4	136.00	363.00	629.00*	1095.00**	37.00*
1/2 V	12 7/16 x 3 9/16	7 3/4 x 2 1/4	3 5/16 x 2 1/4	3 5/16 x 2 1/4	136.00	363.00	629.00*	1095.00**	37.00*
1/4	5 1/4 x 3 9/16	3 5/16 x 2 1/4	3 5/16 x 2 1/4	3 5/16 x 2 1/4	69.00	184.00	319.00	555.00	19.00*
1/8	2 5/8 x 3 9/16	1 5/8 x 2 1/4	1 5/8 x 2 1/4	1 5/8 x 2 1/4	35.50	95.00	165.00	285.00	9.00*
Business Card (1st)	2 x 3 3/4	1 1/4 x 2 3/8	1 1/4 x 2 3/8	1 1/4 x 2 3/8	not avail.	49.00	84.00	147.00	7.00*
Business Card (2nd....)	2 x 3 3/4	1 1/4 x 2 3/8	1 1/4 x 2 3/8	1 1/4 x 2 3/8	not avail.	64.00	110.00	191.00	7.00*

* Full & 1/2 page, 6-mos.: 1/2 due with order; 1/2 due in 3 mos. ** Full & 1/2 page, 12-mos.: 1/2 due with order; 1/2 due at 3, 6 & 9 mos.

† For 6 and 12 month ads, no ad make-up charge if no change is made to ad for entire run.



EDITOR'S COMMENTS

Although the old song says, "'Tis the season to be jolly," we've decided to make *bountiful* our 1997 holiday word. Bountiful certainly comes to mind in describing this December issue, which abounds in articles and ads. It is eight pages longer than the usual A.R.C. and offers plentiful holiday reading as our gift to you.

In fact, good holiday reading may be your message to Santa when you read the three book reviews in this issue. One is by Bill Harris on the new Cones and Bryant book, *Zenith Radio—The Early Years, 1919-1935*—the basis of our lead article. The other two by Dick Desjarlais review the Bunis fourth edition and the related *Radio Collector's Foto Finder* by Ray Bintliff. You might try leaving the December issue around the house—open, of course, to the review pages or the lead article—and thereby head off another wild tie under your tree.

In our lead article, Cones and Bryant preview the information in their new book on Zenith's earliest years. Then called the Chicago Radio Laboratory or CRL, the company manufactured and sold a variety of radio equipment for the amateur and the home. Those early days of expansion into a consumer market make interesting reading.

In the review of the book, Bill Harris reports that Cones and Bryant not only cover the early history of Zenith, but also include over 30 pages of color photographs of Zenith products, as well as a catalog and data base of early sets.

Bill treads gently on the controversy surrounding this and the authors' previous book—*The Zenith Trans-Oceanic*. He comments that "...some may take issue with certain parts of the book..." (The authors themselves in their "Afterword" even take a potshot at "a few hobby writers," calling them "ill-informed individuals.") But, I conclude that this is a fine book, and I look forward to the two follow-on volumes on Zenith.

It is with sadness that we report that Bruce Kelley, the "champion" of the Antique Wireless Association, passed away on November 6th. Combining several sources, including a 1959 article by Bruce himself, Dorothy Schechter, our managing editor, has assembled a tribute to this legend among radiomen.

This month, Ray Bintliff begins a multipart look at capacitors. I expect that this series will both educate the novice and refresh the memories of many others who strive to keep their old radio treasures working.

As with many collectors, Joseph Jackson remembers his grandfather's old radio—a Columbia 31. His need to find it and get it working creates a story we all can relate to with ease.

Al Klopman reports on a blue-mirrored, rare Spartan radio that he found while on vacation in Paris. Of course, he couldn't resist purchasing it, but meeting the challenge of carrying it without damage for two weeks should win Al and his wife a medal.

Three auction reports are included this month. "Better late than never" should be the introduction to the report on the May Houston Vintage Radio Association

auction. Zenith radios drew the big bids here and gross sales were over \$16,000. At the Colorado Radio Collectors Antique Radio Club auction in September, Zenith items shared the spotlight with Atwater Kent and Gloritone items. A brief report on the Morgan Radio Shop auction in August shows that bargains can still be found at some country auctions.

Several short items are also featured in this issue. Ray Bintliff presents an interesting story on Bill Bell, whose illustrations appear on all four of the Bunis book covers. A short piece by Ray Mediema describes the Electronic Labs' Radio Utiliphone, a combination permeability-tuned radio and intercom. In addition, Gerald Schneider comments on the subject of club newsletters vs. journals, while George Shields writes about radio business etiquette.

Photo Review includes items from Europe, plus an early Remler audio control panel. *Radio Miscellanea* features an announcement of importance to A.R.C.'s staff—the arrival of Ryan Nelson Friedrichs.

Renew Now — Advertise Now — Save! Each year, we experience increased costs of postage, printing, supplies, rent, and personnel, plus the other costs of running a small business. To keep A.R.C. serving the radio collecting community, unfortunately, it is necessary to increase A.R.C.'s rates. We always announce these increases in advance so that you can take advantage of current rates before the new ones take effect on January 1, 1998. Annual U.S. subscription rates will increase \$2.00 per year; classified ad extra words, 2c; and display advertising rates, about 7.5%.

Coming Radio Events. Almost three dozen events are scheduled for the radio collector during December and many clubs are holding holiday events. Attention, noncollecting-spouses! Here is a chance to learn a bit about your collector-spouse's passion and perhaps even share some of the enjoyment of collecting.

It's not too soon to be looking forward to 1998 and its offerings. Of special mention are three events just a few months away—the New England Antique Radio Club meet in Nashua, N. H., Radio XXIX in Westford, Mass., and the 3rd annual ski/radio meet at Crested Butte, Colo. I hope to see many of you at these events.

Happy Collecting and Happy Holidays from all the A.R.C. staff!

John V. Terrey, Editor

ON THE COVER

Our cover reproduces a Zenith card for the 1956 holiday season depicting the Zenith Design Salon in Chicago—a showroom for Zenith's new products. In the '40s and '50s, the well known artist Pierre Nuytens produced these corporate cards, as he had produced personal cards for his friend Eugene F. McDonald, Jr., founder of Zenith. An additional tie between McDonald and Nuytens was the Zenith radio station WJAZ located at the Chez Paris, a renowned Chicago restaurant owned by Nuytens. The card is courtesy of Zenith.

WITH THE COLLECTORS

Zenith — The Earliest Years The Chicago Radio Laboratory

BY HAROLD CONES AND JOHN BRYANT

The latest Cones and Bryant book — “Zenith Radio – The Early Years, 1919-1935” — has just been published. A.R.C. is fortunate to be able to present a preview of the extensive contents of this book in the following article about the earliest years of the Zenith Corporation. The first of a planned trilogy of books on the history of Zenith, this book is another example of the enthusiasm for their subject that the authors demonstrated in their earlier publication — “The Zenith Trans-Oceanic: The Royalty of Radios,” previewed in the January 1995 A.R.C. The new information contained in this volume was made available by the authors’ discovery of the sealed files of longtime Zenith Corporation President Eugene F. McDonald in 1993. A review by Bill Harris of this impressive book also appears in this issue. (Editor)

Among the hundreds of radio manufacturers that arose with the popularization of radio in the very early 1920s was the Chicago Radio Laboratory, later to become Zenith Radio Corporation. From the very beginning, CRL/Zenith hung its hat on quality being more important than cost, a philoso-

phy that allowed the company to grow and prosper in the fluid environment of the 1920s. By the onset of the Depression in 1929, Zenith was stable enough to weather the financial storm and emerge as a major manufacturing and marketing force.

THE FOUNDERS

The founders of what was to become Zenith Radio Corporation were two radio amateurs — Ralph H.G. Mathews and Karl Hassel. The two were joined in business a bit later by Eugene F. McDonald, Jr., who contributed his considerable finances, publicity skills and inventiveness. Soon after Zenith formed, master businessman and accountant Hugh Robertson and legendary merchandiser Paul Klugh joined the group, forming the nucleus that eventually propelled Zenith Radio Corporation to a position as a major national manufacturer.

RALPH H.G. MATHEWS

Ralph Mathews built his first amateur radio station (9IK) in Chicago in 1912, soon after be-

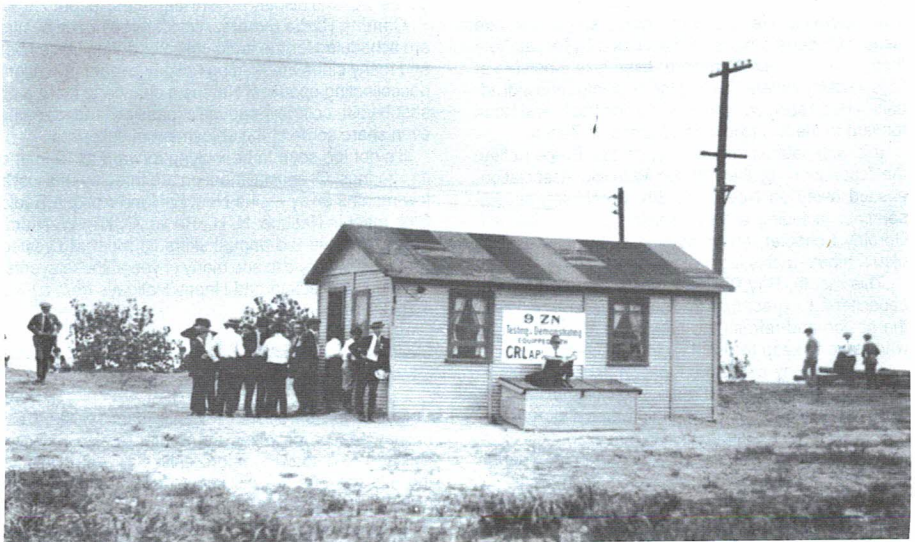


Figure 1. The 9ZN building — the first Chicago Radio Laboratory factory — in early 1921. Half of the 14' X 18' garage, located on Chicago's lakefront at 5525 Sheridan Road, was used for amateur station 9ZN and the other half was devoted to radio production. The sign on the side of the building reads: "9ZN, Testing & Demonstrating, EQUIPPED WITH CRL APPARATUS."

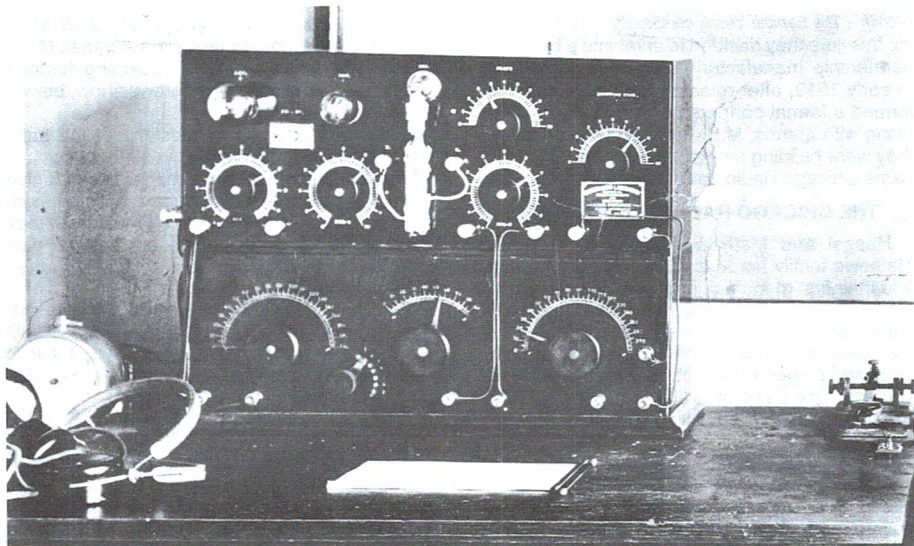


Figure 2. The receiver used at station 9ZN in 1919 is composed of a CRL Type AGN-2 receiver and an Adams-Morgan Paragon Type RA-6.

coming interested in amateur radio. While attending Chicago's Lane Technical High School in 1913 and 1914, he perfected an aluminum saw-tooth, rotary spark gap disk which had such a distinctive radio signal that it could be identified instantly by his amateur contacts. Already well known in the amateur community, he began to accept requests from other amateurs to build equipment of his own design for them.

Mathews graduated from high school in 1914 and began a commercial operation in 1915 as a means of supplementing his college costs. From 1915 until 1917 when World War I stopped all amateur activity, he covered most of his college and personal expenses by building and selling saw-tooth rotary gaps, radio receivers of various kinds, and other equipment for amateur purposes.

In March 1916, Mathews was appointed trunk line manager for the central region of the U. S. for the newly formed Amateur Radio Relay League (ARRL); in February 1917, he was elected to the Board of Directors for the group. About this time his station call letters were changed to 9ZN and with the increased prominence of the station, its operator and his call, his manufactured products became known as "9ZN Spark Gaps" or "9ZN Receivers."

Soon after the war started, Mathews enlisted in the U.S. Navy. He was assigned to the Naval Communications Division, and he met Karl Hassel while stationed at Great Lakes Naval Training Station in Illinois.

KARL HASSEL

Karl Hassel was born in Sharon, Pennsylvania, on January 25, 1896. He attended Westminster College from 1914 to 1915 and continued his studies in 1916 at the University of Pittsburgh. He

had received his amateur license in 1912 and, at Pittsburgh, operated the university's 2 KW, 500-cycle synchronous rotary spark gap station. This very efficient station operated with a special license — 8XI, and had an antenna 125 feet high and 600 feet long stretched between two buildings. It operated primarily on 425 meters, and because of its high antenna, was able to work a large geographic area.

With the beginning of World War I, the government closed all and dismantled most radio stations. However, the powerful University of Pittsburgh station was reserved as a government station. Hassel was one of three operators who took and passed the government examination and operated the station on a 24-hour-a-day basis.

There have been several published accounts of Hassel's involvement with the Pittsburgh University station which state that the station became KDKA, the first licensed broadcast station. Indeed, this story is related in several of Hassel's obituary accounts. The Pittsburgh University station was dismantled in 1918 and did *not* become KDKA. Some of the confusion may have stemmed from the similarity of calls: the Pittsburgh University station was 8XI, while Frank Conrad's call (the station that developed into KDKA) was 8XK.

In early 1918 when the university station was dismantled, Hassel joined the Navy. He became a radio code instructor at Great Lakes Naval Training Station and there met Ralph Mathews. The two worked together at Great Lakes for a few months and then both were transferred to the Naval Intelligence Service offices in Chicago's Commonwealth Edison Building.

When the War ended, they were held briefly before discharge with little to do, and it was dur-

(Continued on following page)

(Zenith – The Earliest Years, continued)

ing this time they decided to enter into a business partnership manufacturing amateur equipment. In early 1919, after release from the Navy, they formed a formal partnership, and by June 1919, along with friends, M.B. Lowe and Larry Dutton, they were building amateur equipment under the name Chicago Radio Laboratory (CRL).

THE CHICAGO RADIO LABORATORY

Hassel and Mathews initially lived in the Mathews family home at 1316 Carmen Avenue, and their first manufacturing location was a table in the kitchen. Operating as the Chicago Radio Laboratory, they produced a catalog in mid-1919. Mathews' father was involved in a printing company and helped them with the catalog. As Hassel said, "...it didn't cost us anything, or we wouldn't have had a catalog. I'm telling you, we didn't have any money."

At first, CRL operated as a retail mail order supplier of amateur equipment, selling a variety of non-CRL apparatus as well as its own. The equipment featured in the first catalog was not stocked but rather manufactured or obtained as it was ordered.

Karl Hassel's account of the earliest days of production were recalled as:

"We used Bakelite panel, and they were all engraved by hand with many a resulting blister. We used what we thought was a unique method of mounting the various parts on the Bakelite panel so no mounting screws would show. We used a double panel with the apparatus proper mounted on the back panel, and then the front panel was held on the back one by the pointer stops. I well remember how we used to get a set all put together and then discover we had left off

something, and so we had to take it all apart again to mount the part on the back panel. Many times we were on the point of discarding this idea and letting all the mounting screws show, but we never did."

Some of Mathews' impressions of the early manufacturing days, recalled in 1978, were:

"As to how many sets we made, I cannot give you a figure. We had 3 workmen, building them by hand. We built them 12 at a time, which took about 2-3 weeks. The total amount, I cannot give you. Then, as the business grew, we started building about 20 at a time.

"Due to our small hand construction, we seldom had much of a stock, but they weren't built specifically to order, unless something special was specified, when [sic.] we would make modifications to order."

EXPANSION

In mid-1919, manufacturing operations were moved to one-half of a 14' x 18' 2-car garage erected two blocks north of the Edgewater Beach Hotel, at 5525 Sheridan Road. Mr. Dewey, the manager of the hotel and a friend of both Mathews and Hassel, allowed the free use of the hotel-owned land with the understanding that the building would be removed if the hotel ever needed the property. The other half of the garage was devoted to amateur station 9ZN.

A large antenna was erected, and with the big synchronous rotary spark-gap transmitter, 9ZN was soon heard worldwide. 9ZN was part of the first postwar transcontinental message relay on December 4, 1919 ([1AW to] 9ZN to LF to 6EA). In January [1921], 9ZN was involved in setting the cross country record of 6.5 minutes for a round trip message — 1AW to 9ZN to 5ZA to 6JD

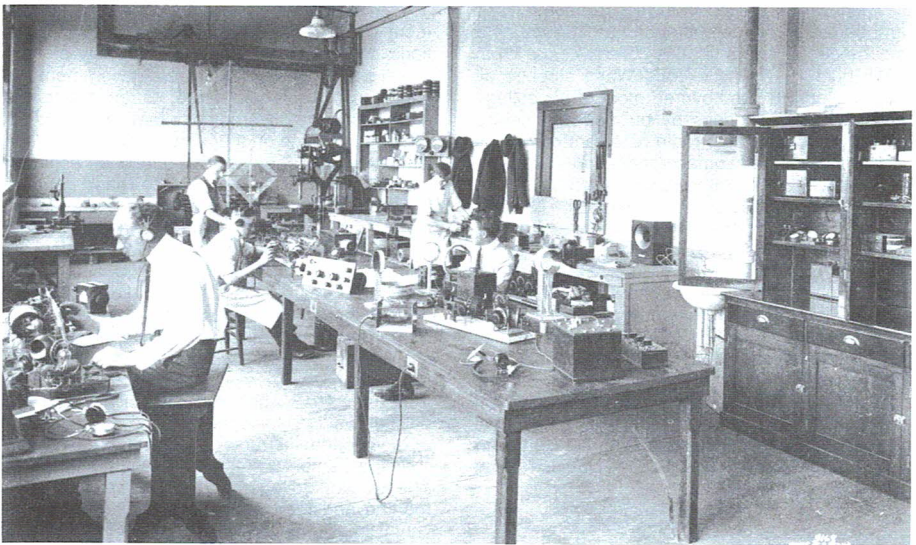


Figure 3. The Chicago Radio Laboratory room. The Engineering Department at the Kedzie Avenue (QRS) plant was led by CRL founder Karl Hassel, shown in the center of the photograph beyond the center table, looking to the left. The radio being tested at the center table is a Zenith 1-R.

and return on the same route with help from 9LR. 9ZN was a featured visitation site during the first National ARRL Convention held August 31-September 3, 1921, at the Edgewater Beach Hotel. Mathews was the Director General (chairman) of the convention and toastmaster of the banquet.

By early 1921, the garage on Sheridan Road had become too small and Chicago Radio Laboratory moved to a 3,000-square-foot rented factory at 6433 Ravenswood.

The major product of Chicago Radio Laboratory was a 2-component regenerative receiver. The top portion of the receiver, called the "Amplifigon," housed the detector and the amplifier, and the bottom portion, called the "Paragon," was a tuner. CRL acquired the names Amplifigon and Paragon from the Adams-Morgan Company after it could not receive deliveries as agents for the company. Then, CRL began building and modifying the units themselves.

Karl Hassel could not recall whether the names were purchased or given to CRL. But, in a letter to friend Leo Gibbs on December 6, 1978, Mathew's recalled, "Adams -Morgan and I had the #1 and #2 licenses under Armstrong's patents. We did not copy their set — we bought them out at almost the same time, about six months after WW I. The 'Paragon' name was more or less the name of the circuit originally. I believe they were out with their model a few months before ours, and we originally used one of theirs at 9ZN, for a short time, much for comparison purposes. I can't give you a specific date as to the first CRL Paragons and Amplifigons, but it was six months to a year after I got out of the Navy active duty at the end of WWI."

There appears to have been no legal action on behalf of either party. The 1919 Chicago Radio Laboratory catalog specifically states that CRL is selling the Adams-Morgan Paragon. The Paragon name was dropped in the 1920 editions of the CRL catalogs as modifications to the original design produced a new, and exclusively CRL, rendition of the product.

Since its equipment was built for the radio

amateur, CRL placed its earliest advertisements in *QST*, the magazine of the American Radio Relay League — the first in June 1919. At the suggestion of an employee, the *QST* advertisements soon began listing the 9ZN call followed by a small "ith," thus providing the famous trade name Z-ΠΠΠ.

With the development of CRL's first broadcast receiver, however, the company began placing limited advertising in Chicago newspapers and a few trade publications. Growth, the associated moves to larger quarters, and the arrival of Commander McDonald combined, in retrospect, at precisely the right time to lay a solid foundation for the rapid development of the fledgling company.

By late 1921, the popularity of Chicago Radio Laboratory equipment had driven demand to levels that were impossible to support from the small CRL factory on Ravenswood Avenue. In early 1922, Eugene F. McDonald, Jr., who had joined Mathews and Hassel in 1920 as General Manager of CRL, arranged for QRS Music Company at Kedzie Avenue and 48th Street to begin manufacturing CRL products. QRS was to use a combination of its own equipment and employees and those of CRL.

CRL was producing only five radios a week in early 1922; by June 1922, it was producing 50 per week. Since radio sales and manufacturing were cyclical, with the peak period being September to January, a manufacturing output of 50 radios in June would indicate phenomenal growth for the small company.

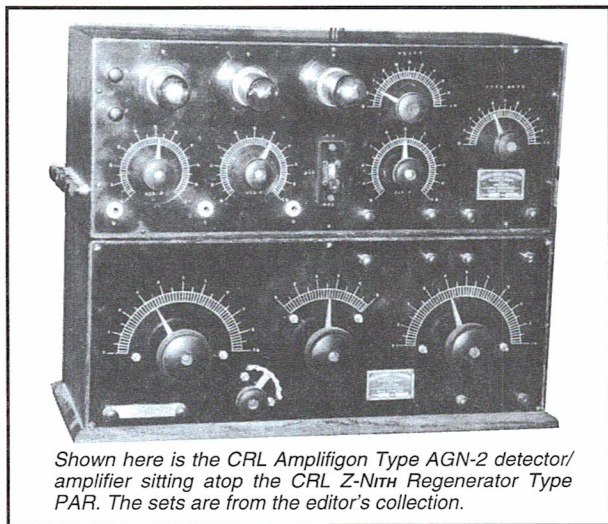
McDonald formed Zenith Radio Corporation on June 30, 1923, as the marketing arm for the Z-ΠΠΠ radios produced by Chicago Radio Laboratory. It was not until several years later that the two merged so that both manufacturing and marketing could be carried out by Zenith Radio Corporation. The original patent for the famous Zenith Lightning Bolt was filed on April 24, 1922.

Readers of the book will note that 20 footnotes accompany the above segment of the text — an indication of the author's extensive research. In this article, only two of those footnotes have been incorporated into the text.

All photos courtesy of Zenith.

An autographed and numbered copy of Zenith radio: The Early Years, 1919-1935 is available from the authors at \$29.95 plus \$2 shipping and handling. Send your order to: The Radio Professors, P.O.Box 592, Stillwater, OK 74076. Checks must be in U.S. funds on U.S. bank only, and sorry, no credit cards. The book is also available from A.F.C. and other A.F.C. advertisers. Please check for ordering information.

John H. Bryant and Harold N. Cones, The Radio Professors, P.O. Box 952, Stillwater, OK 74076)



Shown here is the CRL Amplifigon Type AGN-2 detector/amplifier sitting atop the CRL Z-ΠΠΠ Regenerator Type PAR. The sets are from the editor's collection.

WITH THE COLLECTORS

The Columbia Model 31 In Search of my Grandfather's Radio

BY JOSEPH G. JACKSON

It's always a pleasure when collaboration on restoring a fine old radio occurs through A.R.C. Gerry Schneider's article on the Steinway Capehart in our February 1995 issue led Joseph Jackson to contact him about the appearance of his Columbia 31 cabinet. Gerry provided a photo and voila! — we have an article on a restoration project to share with our readers. (Editor)

Although born after the advent of television and at the start of the transistor revolution, I have always been an antique radio enthusiast. I still recall being overwhelmed by a marvelous mystical feeling the first time I peered into the back of my grandmother's massive Zenith console and saw the warm sunset glow from the vast valley of vacuum tubes. It was sheer magic at that point, and I was totally entranced. Countless crystal sets and various kits (the first being a 1-tube regenerative receiver) fanned the fires within me.

Around the age of eight, I laid hands on a large old chassis my older brother had salvaged from some long defunct set. Among other things, I learned that electromagnetic speakers demanded somewhat more respect than any of the small permanent magnet variety from any of the transistor sets I had previously dissected. Let's just say that I found the field coil voltage quite a shocking experience and in it a valuable lesson.

FIRST RADIO — A DELCO

It was near my tenth birthday when I received the first radio of my collection — a Delco tabletop receiver given to me by my aunt, Julia. My mother clearly recalled listening to the very same set after Sunday lunch on December 7, 1941, when the news of Pearl Harbor was broadcast. This was more than just a radio — it was heritage, and it was family.

Acquiring any fine radio is exciting, but reviving a set that was in the family is akin to a religious radio experience. With a little help from my brother-in-law, an Air Force electronics technician, the set was soon up and running. I figured out how to restring the dial even though packaging twine was the only material I had available.

From that point on, this radio was to be my companion through life, and I carried it with me through college, medical school and residency. Although often tucked away in a closet or attic, it was never very far from my side.

After residency (ironically, I became a radiologist),



Figure 1. The restored Columbia Model 31.

I was able to devote more time to radio collection and restoring. The old Delco was destined to become the first of many projects. The finish was showing the signs of age hastened by multiple moves and extreme variations in climate. The bypass capacitors were balking, and the rectifier tube hadn't survived the last long move. I engrossed myself in repair of the chassis while the cabinet was in the skillful hands of my brother, Sam, who had been restoring fine antique furniture for many years.

THE COLUMBIA SEARCH BEGINS

Within a few months the set was complete, and I had acquired a few more radios in need of restoration. During a discussion over my next anticipated restoration, Sam casually mentioned an old tombstone that belonged to our grandfather (who had died more than twenty years before either of us was born). "It's in an old barn, and it's in pretty bad shape." My interest was immediately peaked to a fever pitch, and I left to search for the radio relic from my family's past.

As I opened the weathered barn door, a shaft

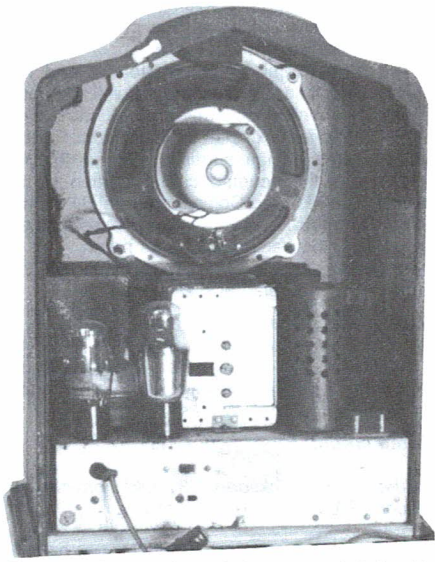


Figure 2. A rear view of the restored Columbia Model 31.

of sunlight illuminated a row of shelves on the inner wall of the corn crib, and there it was! Much to my dismay, it was not the magnificent vacuum tube monument I had envisioned. The cabinet was in a shambles — peeling veneer was lying all about like scales off a day-old mackerel. Both the cabinet and chassis were covered in a thick layer of greasy fat dripped down from country-cured hams which had once been stored overhead. It did not look encouraging, and I felt my heart sink.

After quickly surveying the tragedy, I decided that it was well beyond the scope of my abilities. The tubes could be salvaged but little else. Many components were missing; many were haphazardly replaced and several had obviously been delectable rat food. The choke was missing, and the plates of the tuning capacitor were warped and rat-gnawed. The speaker had no hint of a cone, and the grille work was missing. All the labels were gone; only the brass escutcheon plate gave the name of the maker — “Columbia,” and I deduced it had been a TRF unit. Decidedly disappointed, I loaded the set onto my truck and headed for home.

COLUMBIA HISTORY

My brother saw the radio and agreed the restoration battle had already been lost, but he gave me more insight into its history as related by our late father. My family had managed a small farm store during the Depression. It was a place where field hands could barter their labor in exchange for food and clothing. The Columbia had been a focal point in the store and provided news and entertainment to those people who worked and traded there.

It was probably one of very few radios in the small farming community of Donovan, Georgia,

where a gas-powered Delco plant provided only intermittent electricity. My family was of rather meager means, and anything they had was used to the fullest, a fact which explained the extensive make-do repairs that were painfully obvious beneath the Columbia chassis.

I brought the remains of the radio home and stored it in the basement, hidden behind several boxes so it would be out of sight and out of mind. But it continued to gnaw at me, and I knew in my heart of hearts that I must try to restore the radio my grandfather had listened to — it was one of the few bonds to a grandfather I had never known, and it was my heritage.

The chassis was carefully cleaned, and the damage assessed. I would need a schematic. I had already developed a working relationship with the crew at Antique Electronic Supply. Their diligent search determined that my Columbia was a Model 31.

RESTORATION

With schematic in hand, I began the restoration with new vigor. The transformer still had life although the majority of other components had to be replaced. I found a near duplicate choke in a box of parts at a local flea market. The tuning capacitor was painstakingly disassembled, and the rotor plates individually straightened to prevent shorting to the stator plates. Hank Brazeal did a marvelous job reconing the speaker.

Several times while tinkering with the radio, I was again painfully reminded about the potent field coil voltage — some lessons come hard. Then it happened — a soft distant whisper in the background of harsh static. Although the station I received is but a few miles away and can often be plainly heard as a cheap substitute for Muzak on my telephone, the young Marconi could not have been more excited than I.

It was all downhill fine-tuning from here. After I had traced through the schematic more than once with a highlite pen and rearranged a few components, the volume and clarity had improved, but still remained less than I thought they should be. Mysteriously, reception would greatly improve when my hands were near the RF section and suddenly soften when I removed them. Yet another tedious tracing through the components revealed a previously overlooked open RF coil which was easily repaired and indeed showed signs of prior repair several decades before. The chassis was now complete and seemingly just as sensitive and powerful as it had ever been.

The cabinet had been left with my brother as a pattern for duplication since restoration was obviously out of the question. A large molding from the top and the brass escutcheon plate were the only salvageable items. A small remnant of grille cloth remained on the inside and was a readily available pattern. The grille work had been sawn out for some unknown reason leaving no clue to its original design. I exhausted all leads trying to locate the original grille design and had resigned myself to produce a composite generic design compiled from other sets of the era.

My brother had wiped what remained of the

(Continued on following page)

(Columbia Model 31, continued)

front of the cabinet as clean as possible with mineral spirits and determined it had been done in black lacquer. There was an impressive oriental design emblazoned on the front which included several raised islands linked by a bridge, and there were palm trees and a pagoda as well as numerous sea gulls flying overhead.

Gazing at this wonderful but faded scene, I now realized why this radio had been so popular in the old farm commissary — it offered a glimpse of a far away paradise that would remain only a dream to most of those poor dirt farmers ravaged by the Depression. Many were destined to be born to spend a life of toil and then die on the farm — never traveling further than the county line. This radio had been one of the few links to the outside world, and, if only for a few fleeting moments, a temporary escape from the grim reality of the times.

A much needed break in determining the cabinet design soon came through *Antique Radio Classified*. Thumbing through back issues, I read with interest an impressive article by Gerald Schneider of Maryland about his unusual Steinway Capehart (A.R.C., Feb. 1995). I had a strange feeling I had stumbled onto a hot lead when I read the epilogue about Gerald's fancy for radios with oriental motifs.

Directory assistance was able to provide me with his number, and I nervously dialed it knowing this might be my last hope. A pleasant gentleman answered, and I briefly told him of my plight. "Do

I know anything about a Columbia Model 31?"; he responded, "I'm looking at one on the shelf in front of me as we speak!"

The missing link had been found, and Mr. Schneider graciously provided me with a photograph from which the cabinet could be reproduced. The oriental design on the front was duplicated by an associate's artistic wife, and the set now enjoys the coveted center portion of my mantle. The restored Columbia Model 31 can be seen in Figures 1 and 2. Although not completely an original, this radio will always mean more to me than any other I may have now or in the future — it was my grandfather's. It is family.

Special thanks to:

Antique Radio Classified, Hank Brazeal, Sam Jackson, Dr. Claude Pennington, Gerald Schneider, John Tucker of Antique Electronic Supply, and Larry Weeks.

Photo credit: Gerald Schneider

(Joseph G. Jackson, 6331 Old Forsyth Rd., Macon, GA 31210)

Joseph Jackson, a radiologist, became hooked on radio at age ten when he inherited his uncle's Delco 3-band receiver, which he still owns 30 years later. It may take another 30 years to restore his current backlog of sets. He also collects phonographs, telegraph equipment and medical devices, and hopes to start a collector's club in the middle Georgia area.

Electronic Labs Model 76RU — The Radio Utiliphone

BY WILLIAM S. MIEDEMA

Manufactured in 1947 or 1948, the Electronic Laboratories Inc. Model 76RU, Radio Utiliphone, shown in Figure 1, has several interesting features that I feel make it somewhat unique. The AM band (540 to 1620 Kc) uses permeability tuning rather than a variable capacitor. I've never seen this in a table radio before. The frequency scale moves left and right and is viewed through a magnifying lens in the cabinet.

The scale is backlit with a #47 dial lamp powered off the Type 35Y4 rectifier's filament tap. Other tube Types are a 14Q7 1st detector/oscillator, a 14A7 IF amplifier, a 14A7 RF amplifier, a 14F7 dual audio, and a 50A5 audio output — an odd assortment, sort of an "All American Five" in lokaal. A solid-state diode is used as the 2nd detector. I am not a radio historian, but this is the only radio of this vintage I've ever seen with a solid-state detector.

As you can tell by the name, this radio doubles as an intercom with capability for four remote stations. The set was probably used in a small office building in the late '40s. Judging by the condition in which I received it from my brother (he got it at a garage sale), it had been used a lot over a long period. The rectifier and dial lamp were burnt out. The electrolytics were shorted. The 0.005 condenser off the center tap of the volume control was leaky, as was the "sound

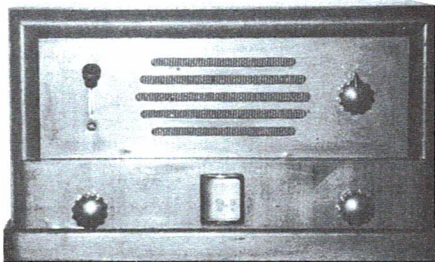


Figure 1. The Radio Utiliphone, Model 76RU.

quality" condenser in the plate circuit of the audio output tube. After replacing these components and cleaning the switches, I had a fine sounding radio with good sensitivity and selectivity across the AM band.

The last thing was to restring the dial cord. This took about as long as all the other repairs, since I am all thumbs when it comes to this job. There must be an easier way, but I haven't found it. After cleaning up the nice dark wood cabinet, I had a quite presentable addition to my collection.

(William S. Miedema, 101 Devonshire Rd., Tower Lake, Barrington, IL 60010-1209)

A Sparton In Paris!

BY AL KLOPMAN

Al Klopman's European discovery makes a nice sequel to Ed Sage's October 1996 article — "The Romance of Mirrored Glass Radios." Al describes the differences between the Sparton European Model 457X and the Model 557, which is the U.S. cobalt glass version. Sage's peach Model 558 has some minor variations. (Editor)

In March 1987, my wife and I planned our trip to Sorrento, Italy, where her brother, who was in the Navy, was getting married. We decided to make the most of our European journey by buying a Eurailpass and seeing as many countries as we could in the three weeks. After flying to London and spending a couple of days seeing the museums and pubs, we took the hydrofoil to Calais. There we began our rail journey through France, Switzerland, Italy, and Germany, where we would take a plane back to the U. S.

We enjoyed Paris so much that we extended our stay there several days. One afternoon, while exploring an out-of-the-way back street, I happened to glance into the window of an old curio shop and there, amongst the glassware, old silver and years of dust, was a Teague designed Sparton blue glass radio. (I am familiar with Walter Darwin Teague designs, as I have a small camera collection which includes a beautiful Teague designed Kodak Bantam Special camera.)

My wife reminded me that the major part of our European trip lay ahead of us, and that backpacking a fragile glass radio around Europe would be cumbersome and risky. However, I decided to bargain with the shop owner in in my broken French for the prize in his window. A little while later and a lot of francs lighter, we were shopping for a soft bag in which to pack our prize. We bought an oversized soft-sided bag with the thought of surrounding the Sparton with our laundry as we traveled. Two weeks and several thousand miles later, we somehow made it back to the U. S. with our Sparton undamaged from the journey.

EUROPEAN AND U.S. MODELS

We have since discovered that our find may be extremely rare. The radio we found is Model 457X, shown in Figure 1, which was the European edition of the cobalt glass Sparton 557 table model made for U.S. consumption. The radios

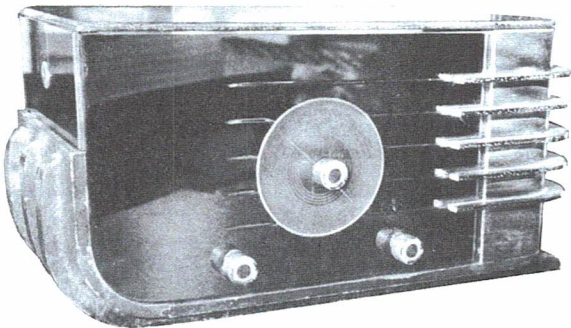


Figure 1. The European Sparton Model 457X blue mirror glass radio.

are similar with notable exceptions. The European 457X has a round tuning window, while the window of the 557 is square. The 457X has a tuning knob in the center, unlike the U.S. models which have three or four knobs at the bottom.

Instead of just station tuning numbers, the 457X dial individually lists the various station locations as they were (and spelled) in 1936 Europe. The dial, printed in black on top and red on the bottom lists some thirty station locations, including Eiffel, Frankfurt, Florence, Hamburg, Prague, Berlin, Budapest, Paris, Leningrad, Oslo and Moscow. The dimensions of the radio are basically the same as the table models made for American use: approximately 17½" wide x 9½" high x 9" deep.

To our additional surprise, in researching the radio with several authorities and club historians, we concluded that this radio may be the sole surviving example of the European blue glass Sparton to survive the bombing of World War II. Other than slight wear on some of the black wood trim on the knobs, the radio is in remarkably good condition with no scratches or nicks on any of the glass surfaces. In a sense, this extraordinary Deco design radio has come full circle in that it was manufactured in nearby Jackson, Michigan, over 60 years ago. Now, not much worse for wear and thousands of miles later, it has returned home to Michigan where we live.

I don't know what this rare gem is worth, but now when we travel, my wife never complains when I want to stop and venture into the out-of-the-way curio shops.

(Al Klopman, 533 South Kenwood, Royal Oak, MI 48067)

COLLECTOR TRIBUTE

The Passing of a Legend — Bruce L. Kelley, W2ICE

BY DOROTHY SCHECTER WITH INPUT FROM WILLIAM B. FIZETTE,
LAUREN PECKHAM, AND JOHN V. TERREY

Just before press time, A.R.C. received the sad news of the passing of Bruce Kelley on November 6, 1997, at his home after a brief illness. At age 82, Bruce was the last surviving founder of the Antique Wireless Association and its museum, which date back to 1952. His partners in that extraordinary enterprise were the late George Batterson, W2GB, and the late Lincoln Cundall, W2GB. The three had come together because of their mutual interest in the history of wireless communications.

Bruce had been diagnosed with cancer in the summer and was unable to attend the annual A.W.A. Conference in September. However, his presence, as always, was felt, and many members visited him before and after this event — even up to a few days before his death. No matter what the obstacles, Bruce always found time for action on the radio front.

Bruce had a long and dedicated involvement with radio. Starting with his licensing as W8ACY in 1929 while he was still in high school, he rapidly became an active radio amateur. His DX record in the 1930s was so outstanding that he was mentioned three times in *QST*, including one feature article on his then unique 20-meter wire antenna.

Intrigued by vacuum tubes and their history, Bruce started a tube collection. By 1948, when his interests had expanded to other early communications apparatus, he and George Batterson combined their collections and established a small museum in Bruce's barn in Spencerport, New York. At the 1948 Hamfest of the Rochester Amateur Radio Association (RARA), Bruce exhibited many of the museum items. In 1952, he combined a slide show with the exhibit. The time-consuming work involved in the museum, exhibits, and slide shows led to the formation of a small club to share the labor. Thus, the A.W.A. was born.

By 1954 A.W.A. was flourishing with 155 members, all of whom were required to be radio amateurs and members of the Antique Radio Relay League (ARRL). Bruce, by then W2ICE, served as secretary and museum curator. Still, the early intention was not to make A.W.A. a separate entity.

Instead, A.W.A. was an affiliate of ARRL — a far cry from today when radio collecting has its own clubs, publications, and encompasses many more activities than just amateur radio. Today, A.W.A. has over 4,100 members, the radio amateur requirement has been dropped, and the museum boasts an endowment of close to \$400,000.

A.W.A. GOALS

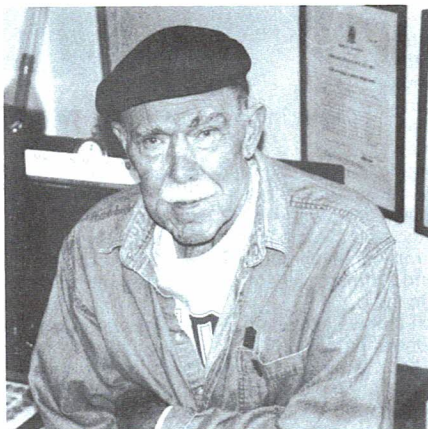
In a May 1959 article in *QST*, Bruce wrote about A.W.A.'s three main goals: first, to maintain one of

the largest amateur club museums in the country; second, to produce a number of movies and slide shows for amateur meetings and to turn them over eventually to the ARRL to loan out to affiliated clubs; and third, to display equipment at various gatherings. In this latter area, Bruce noted that the A.W.A. exhibit had won a first prize at the 1958 ARRL National Convention in Washington, D.C. — an impressive beginning. All three goals have been achieved many times over since 1958.

For example, the museum goal took on a new dimension in 1958 when Bruce moved to Holcomb (now Bloomfield), New York, and re-established it in his new old carriage house. By 1970, the need for more space had become acute and the decision was made to lease and refurbish the 1837 Academy Building in Bloomfield. Later, a separate A.W.A.-owned facility was developed about a mile away.

Gradually the museum branched off from radio into other areas of communication, including wire recorders, televisions, phonographs, and telegraph keys. As the first organization in the world dedicated to the history and preservation of electronic communication equipment, A.W.A. has loaned equipment to such prestigious institutions as the Smithsonian, and to documentary producers like Ken Burns of *Civil War* and *Baseball* fame.

As for the film and slide show goal, Bruce developed and presented to an ever-widening audience shows of wireless history. He continued these and other outreach programs, along with his other AWA activities, until forced by ill health to retire just recently.



Bruce Kelley, Oct. 1997 photo by Rikki Van Camp.

As Lauren Peckham said in an interview with the *Canandaigua Messenger*, "He was one of those guys who thought everybody should be interested in radio history. He was a real salesman, and he would really push. His enthusiasm never faded."

The third goal — to display equipment at various gatherings — was the purpose of the first of the national (later international) A.W.A. Annual Conferences, which was held in the Kelley backyard in 1963. Testimony to the growth of this concept is the 1997 Conference, which was held at the Thruway Marriott in Rochester, New York, with more than 1,000 attending from around the world. The A.W.A. has become a worldwide association due in large part to Bruce's continuing dedication and ability to inspire others to pitch in to help with the ever-growing work load.

A MULTI-TALENTED MAN

Bruce was a man of many talents. He published the first issue of the *Old Timers Bulletin* independently in 1960, and its favorable reception led to its becoming the official journal of the A.W.A. He remained its editor for many years.

There is no question that Bruce was a natural leader and a salesman, with a never-ending interest in his subject and the ability to communicate it to others. He was also ever-ready to help anyone with a problem.

In addition to the A.W.A., he was very active in the Rochester Amateur Radio Association, the Radio Club of America, the American Radio Relay

League, and many other amateur and historical groups. His name was synonymous with wireless history, and he was an acknowledged expert in several related fields. His friends and acquaintances included many of the legendary figures of the early days of radio. Perhaps Ed Gable, the new curator of the museum, said it best, "There is no doubt about it, I will not be filling Bruce's shoes — no one can."

A service celebrating Bruce's life was held in Bloomfield, New York, on November 13. Memorial contributions may be sent in the name of Bruce Kelley to the AWA Museum Building Fund in care of the treasurer, Dexter Deeley, 8 Briar Circle, Rochester, NY 14618, or to the Ontario-Yates Hospice, 756 Prempion Rd., Geneva, NY 14456.

References:

Berlsford, Charles M. "The Founding and Development of the Antique Wireless Association and Its Museum." *The A.W.A. Review*. Holcomb, New York: The Antique Wireless Association, Inc., 1986.

Johnston, Anne. "Local Pioneers in Radio, Aviation Die." *Canandaigua Messenger*, November 7, 1997.

Kelley, Bruce L. "History in the Making." *QST*, May 1959.

Kurvach, Deborah. "Antique Wireless Leader to Sign Off." *Canandaigua Messenger*, October 8, 1997.

(Dorothy Schecter, c/o A.R.C., Box 2, Carlisle, MA 01741)

Club Newsletters vs. Club Journals

BY GERALD SCHNEIDER

Radio clubs have more trouble money-wise and otherwise with their newsletters than anything else they do. Regular newsletter printing, article solicitation, editing, postage, timely mailing, etc., all pose problems. Volunteers to publish and distribute the newsletters vary in number and quality, and change periodically. Surely there is a better way.

There is! More clubs should distinguish between a genuine newsletter and a journal, and act accordingly. Most club members, for example, just want to know about the next meeting, how the last meeting went, what else related to radios is going on nearby, etc. They also want classified ads. That is all that is necessary for a newsletter. And these things may demand only a one- or two-page issue sent routinely.

Radio collecting journal-type articles are nice for authors and readers, but not essential for local clubs. The heart and soul of any radio collecting club are the get-togethers. That is where collectors have personal contact with each other, and radios exchange hands. Newsletters with only the news items mentioned earlier will suffice to keep member relations between meetings.

There may be a need for a dedicated national or international radio collecting journal. However, until one comes along, writing for periodicals that reach most collectors will do the most good. *Antique Radio Classified* with over 8,000 subscribers best meets that standard now.

Informative articles authored by knowledgeable collectors deserve the largest audience. How else

to properly repay these volunteer writers for their time and effort? Moreover, a large readership, country-wide or worldwide, is needed to give feedback which adds information to that which articles provide. Just look at the added learning readers get from letters in A.R.C. in response to articles published. There is not enough expertise in any local club to add as much.

For example, I received a copy of an article on Art Deco and radios in the periodical of a western radio collecting club that I was unaware of. It came in response to my "Art Deco and Radios" article in the June, 1996 A.R.C. Had I seen that before I wrote my article, different as it was, I would have written mine to capitalize and expand on it. Readers around the world would have had even more information on Art Deco and radios than they did.

In one sense, the rest of us collectors are being shortchanged by not seeing the educational efforts of local club newsletter writers. Also, given labor needs and high financial costs, local clubs are spending too much money on journal-type newsletters to reach too few readers.

No doubt there are some reading this argument who disagree. I would be surprised if that were not true, given my own experience. I will welcome other comments, and would hope that A.R.C. would as well.

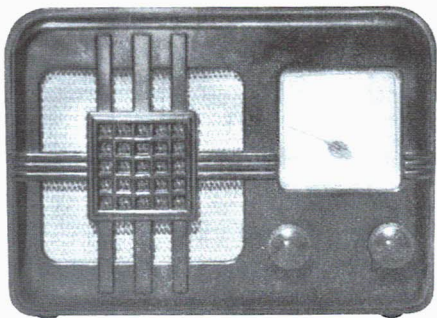
(Gerald Schneider, 3101 Blueford Rd., Kensington, MD 20895)



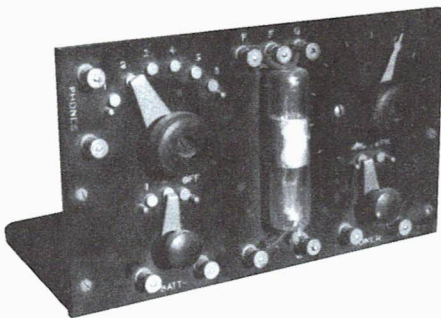
PHOTO REVIEW



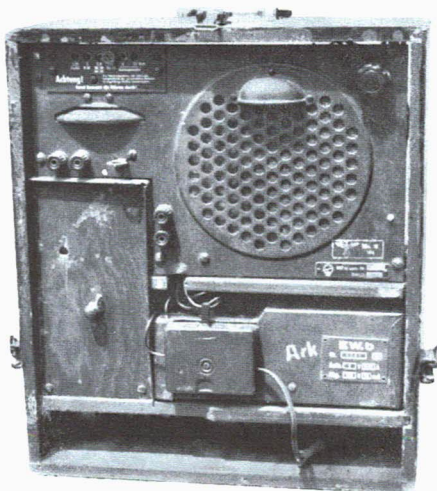
This column presents in pictorial form many of the more unusual radios, speakers, tubes, advertising, and other old radio-related items from our readers' collections. The photos are meant to help increase awareness of what's available in the radio collecting hobby. Send in any size photos from your collection. 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.



LYRIC MODEL 546T – Here is one we don't see very often. This 1946 Lyric, made by the Rauland Corp., 4245 Knox Ave., Chicago, Ill., is an AC-DC set with the standard broadcast band. Brown Bakelite plastic with a gold grille cloth and gold dial scale, it also has a back plate made of the same material as the rest of the cabinet. This back plate fits like a glove and gives the set a very solid feel and look. Is it a little Art Deco? (*Richard Arnold – Lone Grove, OK*)

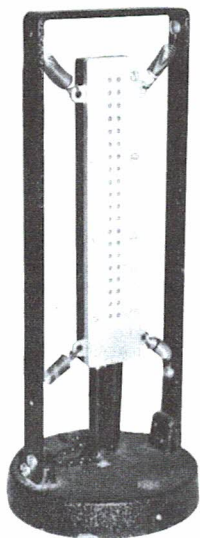


REMLER DETECTOR PANEL – This simple stand-alone panel was the first radio unit offered by the Remler Mfg. Co. The panel and stand is identical to the one sold by the Audiotron Sales Company of San Francisco in 1919. The stamped Remler name is located on the lower-right corner of the panel and seems to have been added later. The panel uses a tubular audion similar to the Cunningham Audiotron shown here. (*Dave Crocker – Mashpee, MA*)



WORLD WAR II GERMAN MILITARY SET MODEL UNKNOWN – This German military set has no model number, but it does show 1943 as the year of manufacture. It's a simple 4-tube set with only one band. The tuning knob is similar to the ones used by Grebe in its Synchrophase radios of the 1920s. My guess is that it was a broadcast receiver for troop entertainment. Although normally battery-operated, there is a German AC power supply unit in it. The power cord has been changed to North American style. Someone wired in an equivalent American tube to bypass a DAF-11. The tube complement is Types DAF-11, (2) DF-11, and DCH-11. I haven't tested the radio, but it must have worked in the U. S. (*Ron Boucher – Goffstown, NH*)

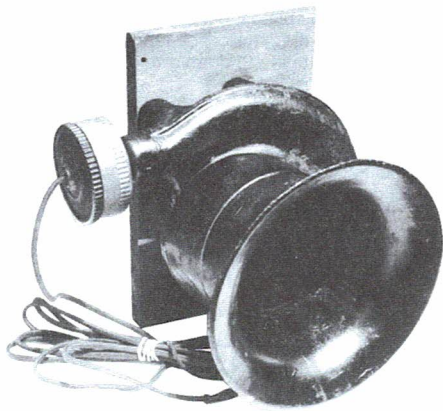
PHOTO REVIEW



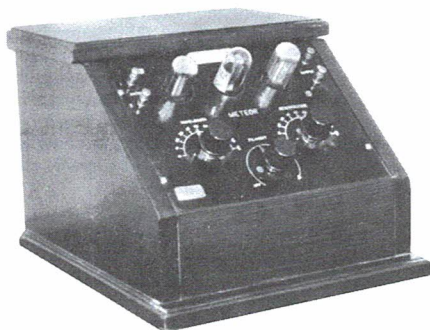
TELEFUNKEN MICROPHONE – This 10½" tall vintage microphone has two Telefunken labels, and inside the hollow cast iron base is the mark "ELA MZ 003/1." I am not a "microphone person" and would appreciate any information addressed to A.R.C. (*Jim Watson – Coarsegold, CA*)



"UNCLE TOM" CRYSTAL SET, GRAFTON CHINA WORKS, BRITISH – This 1924 novelty crystal set is a glazed china figure, 9" high, with red, brown, and black enamel decoration. Note the catwhisker attached to the bow tie and the crystal as a diamond stud attached to the waistcoat. Look closely, and you will spot the enamelled coil wound around the top hat. (*Jim Taylor – Winton-Bournemouth, England*)



HORN SPEAKER – Although it looks like a spittoon, it is really a horn speaker. This oddly shaped horn speaker uses an Atwater Kent Model M driver and has excellent sound. It was probably mounted in a console radio cabinet or speaker table. (*Robert Bailey – Jacksonville, FL*)



METEOR – This set, ca. 1924, was sold by the Sears Roebuck Company, but manufactured by the Radio Shop of Long Beach and Sunnyvale, California, under the Armstrong patent. The three Type 199 tubes stick out of the panel. (*Wally Worth – Wollaston, MA*)

RESTORATION TOPICS

Capacitors in Old Radios — Part 1

BY RAY BINTLIFF

This first in a series of articles about capacitors covers some basic theory that may be of interest to the novice collector and also serve as a refresher for the technically inclined reader. In addition, the construction and testing of capacitors are described. (Editor)

Many collectors consider it desirable to replace all of the fixed capacitors in an old radio during the course of repair or restoration. In advertisements and at flea markets we often see offerings of radios that have been "recapped" (i.e., radios in which all capacitors have been replaced). Is it worth the cost in time and material? Should all old radios be recapped?

This series of articles will attempt to answer these questions and assist you in making a decision about how you should treat a particular radio. But first, it may be useful to review some basic information about capacitors.

As you are probably aware, capacitors were originally called "condensers." The term "capacitor," introduced in the mid-1930s, describes their function more accurately because a capacitor does not condense. Rather, it has the capacity to store an electrical charge. The radio industry was slow to change, and the word "capacitor" did not gain widespread use until the mid-1940s.

During the late '30s and early '40s, both terms appeared in radio service notes depending upon the policy of the manufacturer. GE, Hammarlund, and RCA were among the first companies to adopt the term "capacitor." But curiously, they also used the old terminology for such descriptions as "filter condenser," "variable condenser" and "tuning condenser." However, the new term prevailed, and today we generally speak about capacitors rather than condensers.

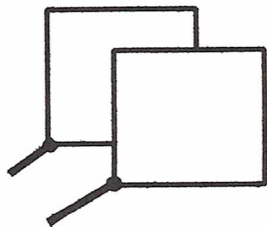


Figure 1. A simple capacitor consisting of two metal plates in close proximity, with air as the dielectric.

CAPACITOR CONSTRUCTION

A capacitor in its simplest form resembles a sandwich and consists of two metal plates which are separated by an insulator. This insulator is given the special name of "dielectric" when used in a capacitor. A wide variety of materials, including air, may be used as the dielectric.

A simple capacitor made up of two plates and an air dielectric is illustrated in Figure 1. Its capacitance can be increased by enlarging the area of the conductive metal plates or by decreasing the spacing between those plates. (The spacing between the plates is determined by the thickness of the dielectric when a solid dielectric is used.)

Conversely, smaller plates or greater spacing will produce a smaller capacity. The type of dielectric material used will also affect capacity. Dielectric materials and their effects are covered in greater detail below.

PRACTICAL CAPACITORS

A simple capacitor comprised of only two plates yields a very small capacity. As described above, a larger capacitance can be achieved by increasing the area of its plates, but obviously, there is a practical limit to the physical dimensions of these plates. Imagine trying to cram a one-foot-square capacitor into a radio!

Multiple plates and layers of dielectric material can be used to produce greater capacity. Stacked like a multilayered sandwich, the alternate plates of the capacitor are connected electrically. This type of construction is shown in Figure 2. Stacking effectively increases the area of the plates while keeping the capacitor's physical size within practical limits. This configuration, using a mica dielectric, can be found in very early battery-

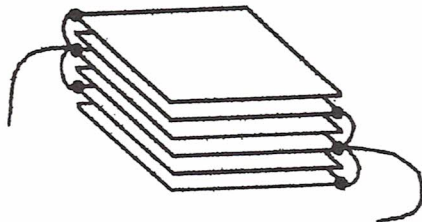


Figure 2. A multilayered capacitor consisting of stacked plates and dielectric material.

operated radios. An example of this capacitor is shown in Figure 3.

The multilayered, or stacked, type of capacitor is limited in the amount of capacity that it can provide. To achieve the high capacity values needed in some radio applications, a different type of construction is required. If long, but narrow, strips of metal foil are used for plates, then the foil and a suitable dielectric can be rolled up into a cylinder shape, much like a jelly roll, as depicted in Figure 4.

This type of construction is used to produce the compact capacitors found in most radios. Figure 5 depicts a typical paper capacitor. Originally, these types of capacitors utilized paper as the dielectric material. As a consequence, they are often referred to as paper capacitors, even though present-day capacitors use plastic film instead of paper.

Not all of these capacitors were tubular shaped like those shown in Figure 5. Some early capacitors were flat, as depicted in Figure 6. In some radios, two or more capacitors were housed in a metal or cardboard "can" to form a multisection capacitor. Philco used molded Bakelite shells to hold single and double capacitors — the infamous Bakelite block capacitors.

CAPACITOR RATINGS

Capacitors are rated in terms of capacitance and voltage. The unit of capacitance is the farad. A microfarad is one-millionth of a farad. A picofarad is one-millionth of a microfarad. Both terms are commonly used to express capacitance value. In old radio literature, the abbreviations "mFd" or "mF" are used to denote microfarads and "mmF" (micro-microfarad) for the current term "picofarads."

Voltage ratings usually represent the maximum operating voltage to which a capacitor can be subjected without causing damage to the capacitor. This voltage rating is called "working voltage." Electrolytic capacitors may also carry a "surge voltage" rating. This rating indicates the maximum short-term or transient voltage that may be safely applied to a capacitor. The surge voltage is usually about 15 percent higher than the rated working voltage.

DIELECTRIC MATERIALS

In theory, any insulating material can be used as

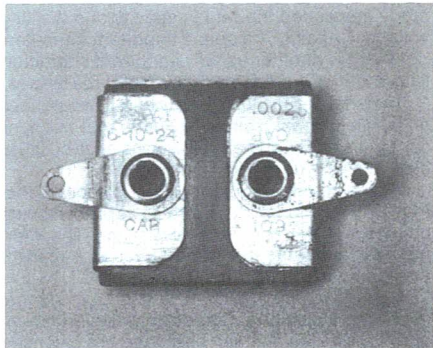


Figure 3. An example of the mica capacitors found in early battery sets.

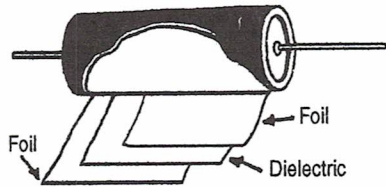


Figure 4. A simplified drawing of a cylindrical-shaped capacitor.

a dielectric. But those most commonly used include air, mica, ceramic, paper, chemical film and various plastics. For example, air is the dielectric in tuning capacitors. Mica was the typical dielectric used in the stacked type of construction found in early battery radios. Paper capacitors impregnated with wax or oil came into wide use because of their low cost and ease of manufacture.

Present-day capacitors use polyester, polypropylene, polystyrene and similar plastic films rather than paper as the dielectric. Ceramic material is also a commonly used dielectric in post-World War II capacitors.

Worthy of special mention is the electrolytic capacitor. This type of capacitor utilizes an extremely thin layer of oxidized aluminum as its dielectric. Remember that capacity increases as the spacing between the plates is reduced. Therefore, this very thin dielectric makes it possible to achieve very high values of capacity in relatively small packages. Since the early days of AC-operated radios, "electrolytics" have been in use as filter and cathode by-pass capacitors.

A DIELECTRIC'S EFFECT ON CAPACITY

Earlier, we mentioned that the type of dielectric material used in a capacitor will have an effect on its capacity. For a given plate size and spacing, some dielectrics will produce a greater capacity than others. The use of air as the dielectric will result in the smallest capacity for a given plate size and spacing.

A dielectric's effect on capacity as compared to an air dielectric is called its "dielectric constant." Some values of dielectric constant are the following:

Air = 1.0
Mica = 5.4
Paper = 3.0
Teflon = 2.1

(Continued on following page)

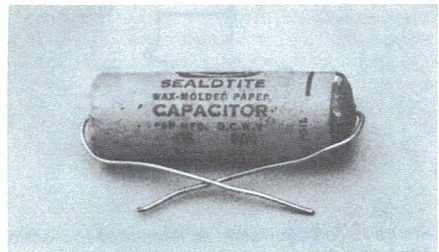


Figure 5. A typical paper capacitor found in old radios.



Figure 6. An example of an early paper dielectric capacitor in a flat-wound configuration.

(Capacitors, continued)

For example, if a 50 pF capacitor was constructed using air as the dielectric and then mica was substituted as the dielectric, the capacity would increase to 270 pF (50 x 5.4).

Another important characteristic of a dielectric is its ability to withstand the application of high voltage. The voltage at which a dielectric will no longer function as an insulator is referred to as its "puncture voltage" or "breakdown voltage." Examples of breakdown voltage ratings, based on a dielectric thickness of 0.001 inch, are shown below:

- Air = 21 volts
- Mica = 4,500 volts
- Paper = 200 volts
- Teflon = 1,500 volts

WHAT IS THE "BEST" DIELECTRIC?

The choice of a dielectric depends upon its intended application and the desired characteristics of a capacitor. After looking at the dielectric constant and breakdown voltage ratings shown above, you might reach the conclusion that it would be a good idea to use only mica as the dielectric in capacitors. Unquestionably, mica stands out as a superior material. But there are other considerations, such as cost and physical size.

Mica capacitors are more expensive than paper capacitors. Mica is a more costly material than

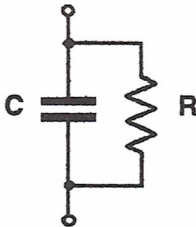


Figure 7. The equivalent schematic of an electrolytic capacitor where R represents the capacitor's internal or "leakage" resistance.

paper, and the fabrication of mica capacitors is more labor intensive. It is easier to automate the manufacture of paper capacitors. The use of mica capacitors is usually reserved for those applications which call for a high voltage rating or good stability. Paper capacitors, because of their lower cost and smaller size, are more widely used.

The relative advantages and disadvantages of capacitor types found in old radios are summarized below:

Electrolytic. This type of capacitor provides large values of capacitance in relatively small packages at low cost. They exhibit high leakage current as compared to other types (more on leakage current later). Electrolytics found in old radios usually have working voltages not greater than 400 to 500 volts and values in the range of 2 mF to 50 mF. These old capacitors deteriorate with age and frequently need reforming or replacement. The working voltages and capacities cited in this article are intended to serve as examples only. Exceptions to these general statements are certain to be found in some radios.

Paper Capacitors. Relatively inexpensive, this type of capacitor produces lower leakage currents than electrolytic, but smaller capacity values as well. Values of paper capacitors usually start at about 0.0005 mF and range upward to 1 mF or 2 mF. Their rated working voltages are usually 200, 400 or 600 volts. These capacitors are a frequent source of problems in old radios because of dielectric failures.

Micas. These capacitors offer high reliability and very low leakage current, but are more expensive than other types of capacitors. Typical values fall into the range of 5 pF to 0.005 mF. Mica capacitors are capable of withstanding very high voltages. As a result they found wide application in transmitting equipment. Micas also have good temperature stability — their rated capacity stays fairly constant with changes in operating temperature.

TESTING CAPACITORS

So much for basics. Now, let's consider the characteristics of a capacitor that are important to its performance in a radio circuit. We have already mentioned the rated capacity and working voltage. Certainly, these are important attributes. But there is another equally important characteristic and that is a capacitor's internal resistance.

If a perfect capacitor could be built, it would have an infinite internal resistance. In the real world, all capacitors exhibit some internal resistance because dielectrics are not perfect insulators.

Internal resistance in a capacitor is shown schematically in Figure 7, where C represents the capacitor and R its internal resistance. The internal resistance has the same effect as a resistor connected in parallel with the capacitor.

A good capacitor will have a very high internal resistance, typically in the order of several megohms. When the internal resistance of a capacitor falls to some lower value, the capacitor may not function properly. In fact, the capacitor may func-

tion more like a resistor. In turn, the radio circuit in which the capacitor is used may not operate correctly.

A high internal resistance is desirable because capacitors are used to block DC voltages but allow the passage of AC voltages. If the internal resistance is low, some DC voltage will pass or "leak" through the capacitor. More on this subject later. Since internal resistance is an important factor in a capacitor's performance, it seems logical that measurement of this resistance value will provide a means for determining the quality of a capacitor. Resistance measurements taken with an ohmmeter will provide a crude indication of the condition of a capacitor. Other test methods can provide a more exacting assessment.

LEAKAGE CURRENT

Measurement of a capacitor's leakage current is a better, widely used method of testing. Measurement of the leakage current is performed with an applied voltage that is equal to the capacitor's working voltage. Such a test setup is illustrated in Figure 8. As before, C represents the capacitor and R its internal resistance. By connecting a DC voltage to the capacitor and inserting an ammeter M in the test circuit, the current flowing through R can be measured. This current is called the "leakage current."

No current will flow in a perfect capacitor since the internal resistance is infinite. But as noted above, real capacitors and their dielectrics are not perfect. Therefore, some small current will flow in a good capacitor, and that current can be measured by a sensitive ammeter, usually a milliammeter. A decrease in the internal resistance of a capacitor causes an increase in the amount of leakage current and vice versa.

Since the basic function of a capacitor is to prevent or "block" the flow of direct current, an excessive amount of leakage current in a capacitor indicates that it is incapable of performing its intended purpose. A defective capacitor, either "shorted" or "leaky," will cause an excessive amount of current to flow because of its low internal resistance. Therefore, the condition of a capacitor can be evaluated by measuring the amount of this leakage current.

When a variable DC power supply is used as the DC voltage source shown in Figure 8, the output voltage can be set to the rated voltage of the capacitor to be tested. Then, the capacitor can be evaluated by measuring the leakage current at its rated working voltage or, if desired, at its actual operating voltage in a particular elec-

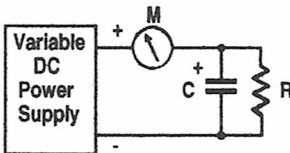


Figure 8. A basic test setup for measuring leakage resistance.

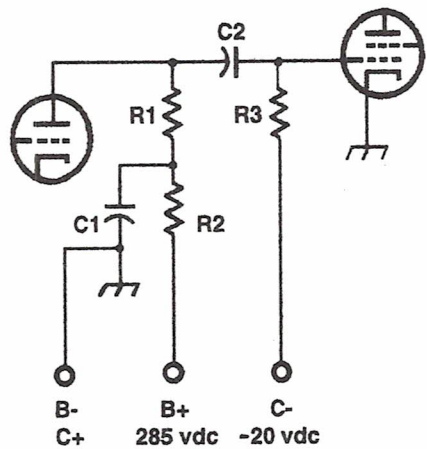


Figure 9. A partial schematic of an audio circuit that illustrates the effects of a failed capacitor.

tronic circuit. This basic test method is used in most commercial capacitor testers to perform leakage tests.

The following examples will demonstrate the effects of excessive leakage current in an actual circuit. Over time, low-resistance paths or complete breakdown may occur in the paper dielectric of a capacitor because of the combined action of impurities, moisture and heat, along with the stress of high voltage.

SHORTED CAPACITORS

For a worst-case example, let's assume that the dielectric failure is complete and that the alternate plates of the capacitor are in direct contact with each other. We now have the classic short-circuit, and the internal resistance of the capacitor will drop to only a few ohms. This low resistance value will cause the "shorted" capacitor to draw a very heavy current. The symptoms which result from this failure are likely to be quite apparent. The actual symptoms will depend upon the circuit location of the shorted capacitor. Some of the effects produced by a failed capacitor can be explained by using the partial schematic diagram shown in Figure 9.

For the first example, let's suppose that C1 has failed. Used as a bypass capacitor, C1 is connected from the junction of the plate load resistor R1 and the voltage dropping resistor R2 to the chassis ground. Because C1 is shorted to ground, the full B+ voltage of 285 volts now appears across R2, and the current through R2 is much greater than that experienced in normal operation. The current I through R2 can be calculated by using Ohm's law, where $I = E/R$ or 0.0114 ampere. ($I = 285 \text{ volts}/25,000 \text{ ohms}$).

Since the amount of current flowing through R2 has increased, the power dissipated by this resistor will also increase. The power P dissipated

(Continued on following page)

(Capacitors, continued)

ed by R2 can be calculated by the formula $P = E \times I$. The power dissipated by R2 is 3.249 watts ($P = 285 \text{ volts} \times 0.0114 \text{ ampere}$). In a typical radio, a half-watt resistor would be adequate for R2. But when C1 is shorted, more than 3 watts of power will be dissipated by R2, and the resistor will overheat, probably burn and emit a telltale odor. In this example, the overheating of R2 is an obvious symptom which points to a failed C1.

LEAKY CAPACITORS

However, a capacitor need not fail completely to affect the performance of a radio. For the second example, let's assume that the audio coupling C2 becomes "leaky," and its internal resistance has dropped to approximately 500,000 ohms (a relatively high resistance, but one that is low enough to cause a problem in this type of circuit).

In normal operation as a class A amplifier, this audio output tube operates with a negative grid bias of about 20 volts. When C2 becomes leaky, it acts more like a resistor than a capacitor and causes a positive voltage to appear at the grid of the output tube. Improper grid bias in an audio

amplifier will result in a noticeable amount of audio distortion.

The need for instruments to check the condition of capacitors came quite early in the history of radio. The driving forces were probably the use of paper capacitors that were more prone to failure, and the use of the higher operating voltages found in AC sets compared to the relatively low voltages found in battery-operated radios.

The earliest capacitor testers were rather simple devices. By the mid-1930s, these instruments had become more sophisticated and were capable of testing for both leakage current and capacity. Commercial capacitor testers will be covered in Part 2 of this series about capacitors.

(Ray Bintliff, 2 Powder Horn Ln., Acton, MA 01720)

Ray Bintliff, W1RY, holds an Amateur Extra Class license. A member of the A.R.C. staff and a retired RCA engineer, he enjoys repairing and restoring pre-1945 radios and test equipment. In addition to Amateur Radio, his interests include electronic equipment design and audio reproduction.

Advertising and Business Etiquette

BY GEORGE B. SHIELDS, JR.

During the past several months, I have experienced a growing frustration when doing business with advertisers in A.R.C. Because of this, I felt it would be appropriate to remind everyone of some simple advertising and business etiquette which will help make radio buying and selling more pleasurable for us all.

When advertising, *please* describe the condition of your merchandise honestly! This means condition of both body and chassis, as well as completeness. It seems that nearly half of the radios which I have purchased over the past year fell far short of the advertised quality. In several cases, radios which were sold as "original" had numerous replacement parts attached, some of which didn't come close to matching the original; in other cases, sets described as "complete" had parts missing altogether — in one case the speaker was missing and the sub-chassis had been partially gutted!

Second, merchandise should be shipped on a timely basis when payment arrives. Following interstate banking reform several years ago, out-of-state checks now clear within 48 hours. If you prefer to wait longer, you should indicate this to the buyer and recommend a USPS Money Order to avoid check clearing delays. In the recent past, I had sent a money order as requested by the seller and still waited nearly 5 weeks for the radio to be shipped! The seller's excuse was that he only shipped once a month, after all sales activity for the current ad had died down. Of course, he didn't explain this when selling the radio to me!

Third, package your sets cleanly and carefully.

Much has been written in this publication about proper packaging. I would also like to add "cleanliness" to the packaging tips. How often have we received an otherwise fine radio in a box with dirt, scraps, and other disgusting debris as filler? Use either foam padding, air foam wrap or Styrofoam when packing your set. In a pinch, use clean newspaper, preferably not shredded. If none of these are available, take your radio to a packaging shop such as Mail Boxes, Etc., and let them do the job for you. It helps keep your customer happy, and that radio sold!

Finally, be prepared to take back cheerfully anything that doesn't meet the buyer's expectations. This can be a fuzzy area, because, as we all know, "excellent" to one may only be "fair" to another. Condition is frequently a judgment call. Although it is my practice when advertising in A.R.C. to describe my offerings as accurately as possible, there have still been a few times when a radio did not meet a buyer's expectations. Unless the radio was damaged by the buyer, I always offer to take the set back for refund. It is just better business. It doesn't imply that the seller was necessarily at fault, only that the buyer and seller viewed the condition of the piece in question differently.

We share in a great hobby as well as in an important and relevant part of preserving our past. If we all follow these courteous steps, our pleasure in collecting will be greatly enhanced!

(George B. Shields, Jr., 108 Jacques Ln., Somerset, NJ 08873)

MEET AND AUCTION REPORT

HVRA/AWA Convention '97 Houston, Texas — May 2-4, 1997

BY BILL WERZNER

The Houston Vintage Radio Association (HVRA) and the Antique Wireless Association (AWA) held the 18th annual convention at the Ramada Hotel Astrodome in Houston, Texas, on May 3-5, 1997. Although there were some scheduling and hotel problems, these were resolved, and many felt that this was the club's best organized event to date.

Of the 677 lots offered in the auction, 614 were sold. The total gross was \$16,706, not quite the record breaker of last year. The Friday auction participants numbered 72, while the Saturday crowd was a bit larger with 82 registered.

Highlights of the auction included an American Bosch clock radio selling at \$500, a Zenith chair-side at \$350, a 1938 Zenith console at \$600, and a Victrola console at \$300.

Planning is underway for the 19th annual convention and mega auction, which will be held January 30 and 31, 1998. This change from May to January for the annual convention means a cooler climate for the event, as well as better hotel arrangements and better coordination with the schedule of the Dallas area club. [It's great to see clubs working together!] Input of ideas and help are always welcome.

NT=no tubes, WT=with tubes, unk=unknown

Altec mixer	\$8
American Bosch clock radio	500
Arvin Rhythm	25
Astatic D-104 microphone	43
Atwater Kent 20 battery set, NT, unk	65
Atwater Kent 42, WT	43
Atwater Kent 44, unk, (2)	20, 28
Atwater Kent 46, WT	20
Atwater Kent 55	15
Atwater Kent 70, in cabinet	160
Atwater Kent 376 console	28

Atwater Kent E speaker, (3)	25, 40, 45
Atwater Kent E3 speaker, (3)	33, 45, 55
Atwater Kent F2 speaker, unk	18
Audiophone horn speaker	130
Auditorium reflex speaker	120
Brunswick cabinet radio, 1929	200
Bulova clock radio	25
Bush, British Bakelite, 220V	40
Bush Gaumont, British	8
Crosley Ace 3B, battery	85
Crosley 56TC	100
Crosley 58	90
Crosley 2420, plastic	10
Crosley Dynacone F speaker	70
Crosley Showbox, metal	10
Crosley Super 8	50
Crosley XJ, audios check good	170
Dynaco	50
Echophone table, wood	65
EICO AM/FM tuner	15
Emerson Deco table	230
Emerson fan	55
Hallcrafters S-38E	20
Hallcrafters S-81	20
Hallcrafters S-85	40
Hallcrafters S-94	15
Hallcrafters SX-62A	150
Knight T-60 transmitter	25
Leeds & Northrup Wheatstone bridge	10
Majestic 7P420, capacitors replaced	35
Majestic 71, console	20
Mantola 3-BD table, wood	35
Philco 37-60 cathedral	60
Philco 38-10 table, wood	28
Philco 39-10 table, wood	40
Philco 39-117 table, wood	55
Philco 46-200 Bakelite	48
Philco 48-482	15
Philco 89 cathedral, restored	200
Philco Model 1201 Bing Crosby radio/phono ...	30
Puritan, brown Bakelite	40
RCA 8X541 table	10
RCA 68R, Bakelite	20
RCA 85T2	43
RCA 118 tombstone	60
RCA Radiola 17	20
RCA Radiola 18 with stand	160
RCA Radiola 33	20
RCA Radiola 60	75
RCA Radiola 100 drum speaker	25
RCA Radiola 103 tapestry speaker	85
RCA Radiola dealer sign	220
RCA receiving tube manual	6

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.

(Continued on following page)

(HVRA/AWA Auction, continued)

RCA TV, early	100
Records, 78 rpm, (30)	13
Red Skelton records	33
Rider's Vol. 5	20
Rider's Vol. 6	18



Jan Johnson's contest entry, a new home brew — the "Alice in Wonderland" cathedral — depicting the characters in their topsy-turvy time warp.

Rider's Vol. 10	5
Rider's Vol. 11	15
Steinitz console	100
Stewart-Warner Porto Baradio, plastic	40
Tube(s): 6SN7, (25)	10
Victor RE45 radio/phone	50
Victor Victrola console phono	300
Watterson Model 68	60
Watterson table, wooden	38
Westinghouse WR72	35
Zenith 7S633	130
Zenith 8H832	7
Zenith 8S239, 1937	300
Zenith 50TIX	50
Zenith 1000 transistor radio	75
Zenith chairside	350
Zenith console, 1938	600
Zenith Royal 3000-1	160

(Bill Wernzer, 11402 Endicott, Houston, TX 77035)

© 1997 The Houston Vintage Radio Association

For more information on the Houston Vintage Radio Association (HVRA), write to David Moore, 3213 Regal Oaks, Pearland, TX 77581. HVRA publishes "The Grid Leak" monthly. Dues are \$15 per year. In addition to the annual convention with AWA, the club holds monthly meetings and special regional events.

Morgan Radio Shop Auction Salisbury, North Carolina — August 23, 1997

CONTRIBUTED BY MIKE MORGAN

The following story of the Morgan Auction is the result of our asking about the outcome of the event when Mike Morgan called too late to advertise it in the August issue of A.R.C. He tells us that if he hadn't already contracted with the auction house, he could have sold the items through A.R.C. "at much greater financial advantage." Unfortunately, as a noncollector, he belatedly learned about A.R.C. Moral of the story: get the word out, you collectors, and save the treasures of old radio shops. (Editor)

The contents of the Morgan Repair Shop were only a portion of the estate auction held August 23, 1997, in Salisbury, North Carolina. The radio repair shop, located in an old filling station beside the family home, operated from the early 1940s to the early 1950s. It was never the primary occupation of my father who died in 1985. His interest in radio and electronics was lifelong, and the span of radio-related materials both predated and postdated the operation of the repair shop.

There was little organization to the items for sale, and their condition, except by surface examination, had not been verified. Radios I can remember listening to as a youngster had not been plugged in for more than 35 years. In addition to a sizable number of tubes and parts that were unused in original packaging, there were many boxes of tubes in unknown condition. These sold anywhere from \$10 to \$60.

There were also boxes of other radio parts, some

new, some used, including knobs, speakers, cases, and lots of things I didn't recognize at all. Finally, there was a substantial amount of military surplus electronic equipment, most of it from World War II, and most of it unidentifiable to the uninitiated.

Magazines, catalogs, and books were in abundance. Rider's *Perpetual Trouble Shooter's Manual*, Vols. 3-14, and 16, ca. 1938, sold for \$70. Other lots sold in the \$5 to \$20 range.

Radio collectors will be appalled to know that, in the 1960s, my brother hauled a whole truckload of old radios to the city dump. Consequently, there were not a large number of radios. An RCA Radiola 66 sold for \$70. Among others selling at minimal prices were an RCA Model 60-8 Bakelite table radio, a Kent table radio with canvas-coated cover, and a Silver-Marshall Superheterodyne console.

Forty lots of radio-related items sold at the end of the 4½-hour session.

For one who is not "into radios," it was interesting to meet some of the bidders. The gentleman who bought most of the large consoles told me that his hobby is refinishing radio cases and that he knows nothing about repairing the radios themselves. Another collector had his station wagon loaded with purchases; he would have bought more, but he didn't have room for it. This was definitely a buyer's market. We wish you had been there!

(Mike Morgan, 104 S. 16th St., Nashville, TN 37203-1907)

The Colorado Radio Collectors Antique Radio Club Auction

Denver, Colorado — September 14, 1997

CONTRIBUTED BY LARRY WEIDE

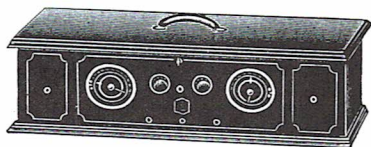
The Colorado Radio Collectors Antique Radio Club (CRC) held its annual auction on September 14, 1997, at the VectraBank Building in Denver, Colorado. As usual, the event was open for buying and selling to both CRC members and the entire community. This year's auction was a great success with 112 lots of radios and related items changing hands for a total of over \$4,000. Auctioneer Jim Bureson did a fine job.

An attractive feature of this auction is that there are no registration fees, only a seller's commission on items sold. This year there were no buy-backs or leftover items — everyone went away happy.

Collectors can look forward to CRC's annual April show and sale at Denver's largest collector's fair where members sell to a very large audience specifically interested in antiques. For information on how to become a part of this event, contact: Larry Weide at the address below.

Admiral 5X11N	\$20
Admiral 6C229	15
Admiral 4220-D5	5
Admiral 5022	35
Airline 52-336	6
Airline 94HA-1562	15
Airline BR15421A	20
Atwater Kent 30 and speaker	90
Atwater Kent 33	30
Atwater Kent 42, Pooley	150
Atwater Kent 70	80
Atwater Kent 427 console	200
Atwater Kent F4 speaker	75
Blabber Mouth novelty transistor radio	13
Burt 'n Ernie novelty transistor radio	20
Cannon novelty transistor radio	23
Capacitance checker and tubes	105
Cheeseburger novelty transistor radio	13
Continental portable	8
Coronado 05RA2	13
Day-Fan battery set	160
Eico grid dip meter	35
Emerson 695, 1952, plastic	20
Fischer Am/FM 8 track	20
French fries novelty transistor radio	25
Gas pump novelty transistor radio	38
GE 400, 1950, plastic	15
GE 535 plastic clock radio	13
GE E91, 1936, table	135
Globe novelty	35
Gloritone cathedral	210
Hallcrafters S-38, black	40
Hallcrafters S-38, grey	15
Hallcrafters S-53	40
Hickock 209A meter	35
Hickock tube tester	15
Knight tube tester	13

Magnavox plastic clock radio	15
Military BC348, AN/FRF22	20
Motorola 5A74	13
Motorola 47D1	80
Motorola 68X12	15
Packard Bell 5R1 plastic, 1957	13
Philco 37-1505	180
Philco 42-842	15
Philco 46-1201	15
Philco 46-131	20
Philco 51-629	7
Philco AM/FM	10
Phonograph novelty	20
Precision power supply	45
RCA 2XF92 and 66X11	30
RCA 6BX6	10
RCA 65U radio/phono	23
RCA Nipper work mat	30
RCA Radiola 16 and speaker	130
RCA Radiola 18	100
RCA Radiola 33, metal	18



RCA Radiola AR-812 Superhet portable	20
RCA tube caddy	45
Realistic 150 SW	55
Realistic PR-01	5
RF military generator URM25	40
Sentinel 338, 1951, plastic	20
Silvertone 101-609-74	35
Skysox novelty	10
Staco 501 variac	45
Stewart-Warner A6	50
Stewart-Warner R-136A	120
Stewart-Warner R-180A	40
Zenith 7S634R	60
Zenith 8GP05YT	30
Zenith 3000	200
Zenith H724Z	20
Zenith H725	20
Zenith R723	28

For information about joining the Colorado Radio Collectors Antique Radio Club, contact: Dick Hagrman, 3429 W. Berry Pl., Littleton, CO 80123, rhagrman@aol.com. CRC holds monthly meetings, as well as auctions, and swap meets, and publishes "The Flash" bimonthly. Dues are \$12 annually, prorated to June 1.

(Larry Weide, 5270 E. Nassau Cir., Englewood, CO 80118. E-mail: lweide@ibm.net)



Zenith Radio — The Early Years: 1919-1935 By Harold N. Cones and John H. Bryant with Martin Blankinship and William Wade

REVIEWED BY BILL HARRIS

On a kitchen table in a house on Carmen Avenue, Chicago Radio Laboratory (CRL) had its humble beginnings. It later became the Zenith Radio Corporation, and one of the giants of the radio industry. In their earlier book, *The Zenith Trans-Oceanic — The Royalty of Radios*, authors Harold Cones and John Bryant gave us insight into Zenith from the standpoint of the birth and development of the Trans-Oceanic sets. In this latest book, *Zenith Radio — The Early Years: 1919-1935*, they give what may well prove to be the definitive answer on the history of CRL and Zenith from the beginning up to 1935.

This book is the result of exhaustive research through Zenith archives, and the fortunate find of the personal files of Commander Eugene McDonald — the driving force behind Zenith — in an old Zenith television assembly plant. The authors have provided us with photos and information on the Zenith Radio Corporation that might possibly have been lost forever. Some of the material has never been published until now.

As in the first book, the authors' writing style is an easy and enjoyable read. This one too is soft-covered, and, except for the database section, is printed on heavy coated stock. In a note from author Bryant, we learn that, according to the publisher, the paper in the database section is the same weight and quality as the coated stock. However, the uncoated paper reduces glare on the tables and makes it easier to add notes on these pages. I find that this difference doesn't detract from the book at all.

The book is divided into three main sections with three appendices and endnotes. Section I contains six chapters on the history of Zenith radio, while Section II features 30 pages of color photos of Zenith and CRL radios. Section III contains pages devoted to an illustrated catalog and database of



CRL and Zenith products. In all, there are 223 pages packed with information.

SECTION I — HISTORY

Chapters 1-4 of this section cover the very beginnings of Chicago Radio Laboratory when Ralph H. G. Mathews and Karl Hassel, two Navy buddies, began building receivers on the kitchen table of the Mathews home on Carmen Avenue in Chicago. The story continues on to the subsequent move to a garage near the Edgewater Beach Hotel, the association with the QRS Music Company, and the eventual move to a 3,000-square foot rented factory at 6433 Ravenswood.

The growth of CRL into the Zenith Radio Corporation, the role Zenith played in helping to define the growing broadcast industry, the formation of Zenith-owned radio station WJAZ — all under the leadership of Commander Eugene F. McDonald — are covered in great detail.

Chapter 5 is an intimate look at the adventurous commander and his many travels, along with his association with the famed explorer Donald B. MacMillan. This is probably one of the most detailed insights into this almost "mystical" leader of the Zenith Corporation ever written.

Chapter 6 deals with surviving the Depression years. Many radio manufacturers folded quickly after the stock market crash on October 24, 1929. On October 23, 1929, Zenith turned out 2,300 radio sets, with wholesalers begging for more. After the crash, orders practically stopped, and production was down to 300 sets a day. But, Zenith had not kept a large inventory of expensive sets on hand. Instead, the company kept a stock of raw materials and could easily and quickly switch to producing lower cost radios. This flexibility was a factor in its ability to survive when so many other manufacturers were going under.

Section I is loaded with photographs, along with numerous old-time ads for Zenith products.

SECTION II — COLOR PHOTOGRAPHS

Section II contains photographs of Zenith and CRL radio sets. There are 31 pages of excellent color photos, from the early CRL sets to the highly prized 1935 Stratosphere Model 1000-Z. The photos are of sets from various private collections. I compliment the authors, who did the photography, on providing this visual record of Zenith radios, some of which are the only known existing models. These photos may well provide the only opportunity for many readers to see what these beautiful sets look like.

SECTION III — CATALOG AND DATABASE

The CRL and Zenith Illustrated catalog is a very good piece of work by the authors. According to author Bryant, over half of the images of the sets have not been published since their introduction in the 1920s and 1930s.

The tables in the database section are a wealth of information. There are separate tables for CRL and Zenith products. The CRL tables list model year, name, type, description, original price, and comments. The Zenith tables list model year, model, name, style, chassis, circuit type, number of tubes, power required, band coverage, original price, and comments.

In a conversation I had with Bryant, I learned that a lot of careful research went into the database concerning the retail model year. Even though he suspects there may be some controversy in this area, he stands by it one hundred percent.

The Index and Rarity/Value Guide is sorted by model number giving the model year, a rarity scale, and value range. Most price guides include value ranges based on a radio's condition. But in this book, the authors state, "The Value Ranges in the Index are not the Value Range of a particular set, varying related to its condition, with a mint set at the upper end of the range. Rather, the value range is a statistical grouping of different models of similar value where the average 1997 price for a particular model would fall, if the radio in question were in Very Good to Excellent condition, with the original finish."

This entire section will serve as an invaluable reference for the Zenith collector, and once again, the authors are to be commended for bringing together this useful information.

APPENDICES AND ENDNOTES

There are two charts in the Appendices: one gives national sales figures and the number of sets sold; the other, gives Zenith sales figures for the years 1921-1935. Another page gives a brief technological history of Zenith products in chronological order. There are over 16 pages of endnotes which should satisfy just about anyone's curiosity as to the source of information.

FINAL COMMENTS

As with their earlier book on the Zenith Trans-Oceanic sets, John Bryant and Harold Cones have done a superb job with this current work on the Zenith Radio Corporation. I am sure that once you pick it up, you will find as I did, it is hard to put down.

The book however, is not without a few drawbacks and errors, and as a reviewer I would be remiss in not listing them. The following were pointed out to me in an e-mail from John Bryant and can be attributed to mistakes mostly made by the publisher and printer.

Small print type: According to the publisher, the print is rather small in order to cut the number of pages and keep the cost of the book down. I have to agree that the small print does make reading a bit harder for those of us who need a little assistance in the sight department.

Page 6: The names of Nate Aram and John McCallister are misspelled.

Page 57: Four photos of WJAZ are shown with the captions completely scrambled.

Page 71: Two photos have the captions reversed, and the photos are printed as mirror images.

Inside back cover: The price should read \$29.95 and the page count 223.

Back cover: The fourth word of the last sentence of the first paragraph should read "an" rather than "in."

The research that went into the making of this book had to have been an arduous undertaking, and my review may not do it justice. Some may take issue with certain parts of the book; however, the picture of the past often has missing pieces, and it is sometimes hard to tell just how all the pieces should fit.

Unless you have firsthand knowledge of the past by having been there, or has access to those who have, you have to rely on what you discover by your own research or the research of others. You take that information, which may or may not be completely accurate, and draw your conclusions. Slowly, pieces of the puzzle began to fall into place, and when finished, you either have a complete picture or one with enough pieces to enable you to stand back and say, "that must be pretty close to how it was."

This book puts a lot of the pieces together into what has to be the best picture to date of the history of CRL and Zenith. Today, when corporations seem to have very little interest in their past history, our hats are off to Bryant and Cones for their diligent search for the pieces to a very interesting picture of the past. For the collector of old radios, or anyone with an interest in the history of radio, this book is a must as an addition to the library.

Zenith Radio — the Early Years: 1919-1935 is available in an 8 1/2" x 11" horizontal, soft cover format at \$29.95, plus \$2 shipping and handling, from: The Radio Professors, P.O. Box 592, Stillwater, OK, 74076. Checks must be in U.S. funds on a U.S. bank only, and sorry, but no credit cards.

The book may also be ordered from *Antique Radio Classified* and other A.R.C. advertisers. Please check them for shipping information.

© 1997 by Bill Harris

Bill Harris, a member of the Vintage Radio and Phonograph Society, is very active in the club and on the internet, from which we obtained this review.

(Bill Harris, 1513 Bellechase Dr., Roanoke, TX 76262)



The Collector's Guide to Antique Radios, Fourth Edition by Marty & Sue Bunis

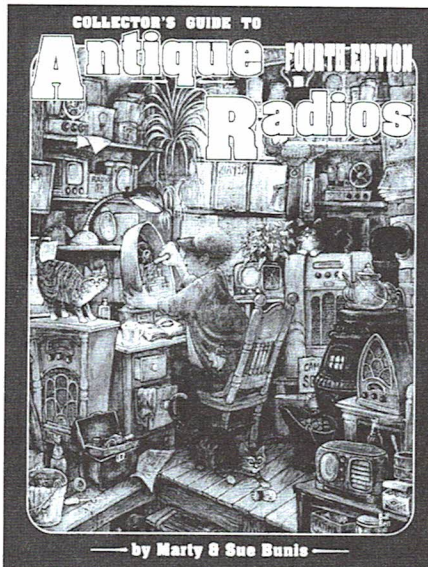
REVIEWED BY DICK DESJARLAIS

Marty and Sue Bunis must have lost sleep over how to improve their popular series, *The Collector's Guide to Antique Radios*. Having used their fourth edition since it hit the shelves earlier this year, I can say to Marty and Sue, "Sleep easily — you've done it again."

This edition, as with the first and third editions, features the attention-getting "Ace Radio Repair" drawing by Bill Bell, this time with a bright purple border. Another Bill Bell illustration "Magic Box" appears on the cover of the second edition.

It is tempting to rush ahead to the pages where so many vintage radios are listed and pictured, but the reader should take the time to review the helpful material on pages 4-6 regarding pricing, basic radio terms and descriptive information. Missing from this edition is the usual listing of Radio Clubs. It is understandable that subscribers to A.R.C. would consider such a listing to be redundant, since a complete listing of clubs and meet schedules is updated monthly. However, a club directory in Bunis would be helpful to nonsubscribers and new collectors/dealers seeking radio clubs and activities in their localities.

This fourth edition, with 248 pages, features nearly all of the information from the first three books, along with new models, many new photographs and updated pricing. Worth noting is a change in price listings. For the first time Bunis uses a price range for each radio, varying in increments from \$5 to \$100 and up, depending on the radio's value. For example, the RCA Model R-7A "Superette" tombstone is listed from \$100 to \$130, the Philco Model 54C mantle radio from



\$70 to \$80, and the Crosley Model VIII portable from \$500 to \$600.

Baby boomers will appreciate the expanded listings and new photos of the later, more affordable plastic radios of the '50s and '60s. As in the third edition, transistor radios are no longer listed. However, you will find over 2,500 models exclusively listed in the third edition of Bunis' *Collector's Guide to Transistor Radios*.

If a fifth edition of the *Collector's Guide to Antique Radios* is published in the future, some attention should be given to the lack of any photos for several manufacturers listed; for example, Amrad, Belmont, Browning Drake,

Farnsworth, Federal, Freshman, Kolster, Mitchell, Remler, Truetone, Tuska and others. Regarding Amrad, Browning Drake, Federal, Freshman and Tuska, a case could be made to have included more photos of battery sets.

Nevertheless, this fourth edition is another excellent effort in the true Bunis tradition. Collectors need not only this volume, but also Ray Bintliff's *The Radio Collector's Foto Finder*, an index to illustrations in all four Bunis editions.

"*Collector's Guide to Antique Radios, Fourth Edition*," is available in an 8½" x 11" softcover format at \$18.95 from the publisher, Collector Books, P.O. Box 3009, Paducah, KY 42002-3009; Marty and Sue Bunis, 32 West Main St., Bradford, NH 03221; and A.R.C. and other A.R.C. advertisers. Be sure to check these suppliers for shipping information.

(Dick Desjarlais, 48 Foster St., Littleton, MA 01460)

The Radio Collector's Foto Finder

By Ray Bintliff

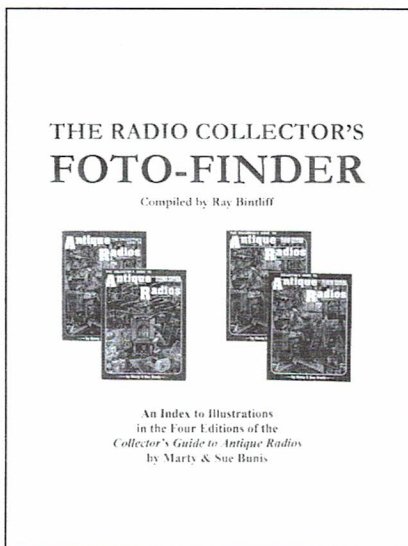
REVIEWED BY DICK DESJARLAIS

Hot on the heels of the *Collector's Guide to Antique Radios, 4th Edition*, by Marty and Sue Bunis, *The Radio Collector's Foto Finder* by Ray Bintliff is a boon to owners of any or all of the Bunis series. This 48-page paperback contains an easy-to-use index to the more than 2,000 high quality photographs that appear in the Bunis books.

Now that four Bunis editions have become available over the past six years, a serious collector can monitor pricing trends and take advantage of a broad base for identifying a particular radio. But, randomly searching through over 900 pages for a photo to match a given make and model number is a formidable task.

With Ray's one-of-a-kind index and armed with the brand name and model number, the radio sleuth will quickly find the appropriate edition and page number for any radio pictured in the four editions. Arranged in alphabetical order by brand name, the *Foto Finder* lists each model that is illustrated in the Bunis guides, followed by the proper edition and page number. An additional feature is a table of contents which gives the *Foto-Finder* page number for each of the 240 brand names listed.

In the preface, Ray explains the rationale for using brand names. The brand names used in the *Foto*



Finder track the brand names used in the Bunis editions, even though in some cases the brand name and the company name are different. Similarly, Ray describes the vagaries regarding model numbers, which can consist of one or more numbers, one or more letters, or a combination of numbers and letters.

The cover of this useful book tells a story in itself, as it portrays each of the four Bunis covers, drawn by Bill Bell. Ray's goal was to provide the radio collector with quick and easy access to any photo published in the Bunis series. In "spot testing" several makes and models through the table of contents and the index, I can report that Ray has met this goal in a simplified, accurate, and well organized format.

Any Bunis edition owner will value the *Foto Finder* as an invaluable companion when researching that elusive set in his collection.

The Radio Collector's Foto Finder is available at \$12.95 in an 8½" x 11" saddlestitched, soft cover format. It may be ordered from A.R.C. and other A.R.C. advertisers. Be sure to check these sources for ordering information.

(Dick Desjarlais, 48 Foster St., Littleton, MA 01460)

Bill Bell and Ace Radio Repair

BY RAY BINTLIFF

Radio collectors were introduced to the work of artist Bill Bell when his *Ace Radio Repair* appeared on the cover of the 1985 issue of A.R.C. It appeared again on the cover of the June 1989 issue — this time in full color to celebrate the fifth anniversary of A.R.C. This full color treatment inspired Marty and Sue Bunis to use this illustration on the cover of the first edition of *The Collector's Guide to Antique Radios*. Marty and Sue used another Bill Bell creation, *Magic Box*, on the cover of their second edition. As noted in the Bunis books, copies of *Ace Radio Repair* and *Magic Box* are available from Frank Krantz who first saw Bill Bell's work at an art exhibit in a New Jersey shopping mall in 1985. Impressed by Bell's colorful style, Krantz arranged to sell prints of the two radio-related paintings.

Born in Philadelphia, Bill trained as a saxophonist. Although employed as a musician during the big band era and later as a successful executive with a major record company, Bill always wanted to be an artist. To

quote from a biographical sketch "Without any formal art education, Bill Bell has developed a very personal primitive/naive style of painting, creating his own world of vision and fantasy...his paintings include situations alive with people, action, (and) animals that smile."

Cats appear in many of his paintings — another reason that cat lovers Marty and Sue chose his *Ace Radio Repair*. I find his work a delight for the eyes and mind. Bell's statement "I paint for fun" says it all.

For readers with a further interest in Bell's works, his original paintings, plus a large collection of prints, are sold through the Jaro Fine Arts Gallery, 956 Madison Avenue, New York, NY 10021. Interestingly, the original paintings of *Ace Radio Repair* and *Magic Box* are in the personal collection of Jaro Parizek, gallery owner and radio collector. My thanks to Jaro for permitting us to quote from his gallery's brochure.

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



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.

Ryan Arrives Early!

A.R.C. announces the arrival of Ryan Nelson Friedrichs on October 29, at 10:30 A.M. Much to our surprise, Ryan decided not to wait for his scheduled date of November 17 and left us without Lisa, our office manager, sooner than we had hoped. In fact, we didn't even get to have the much anticipated "retirement to motherhood" luncheon. Ryan now will be able to attend that rescheduled event with his parents who are recovering from the shock of his hasty arrival. As forecast in our November "Staff Profile," Lisa and Eric — and now Ryan — never cease to amaze. (Editor)

Ft. Monmouth Radio Ghosts

Dear Editor:

What a neat magazine you have! I work at the U.S. Army Communications Command (CECOM), Ft. Monmouth, N. J., where the U.S. Army Signal School was located until 1975. A lot of military radios are advertised in A.R.C., and I began to think that a good number of A.R.C. subscribers probably were here at one time or another. I'm sure the ghosts of many old radios haunt the grounds and buildings here at Ft. Monmouth.

The New Jersey Shore also has a great deal of radio/communication history. At Camp Edwards, a satellite area of Ft. Monmouth, there is a small tower and plaque where Marconi tested his wireless. And at the Twin Lights in Highlands, N. J., there is a stone marker where Marconi used the wireless for its first "big time" public demonstration.

Mark Hendrickson, Oceanport, NJ

Marconi's Daughters Die

Dear Editor:

I have talked with Francesco Marconi Paresce and learned of the death of his mother, Degna Marconi Paresce, at age 90. She was the older of two daughters by Marconi's first marriage, and will be remembered for her biography, *My Father, Marconi*. Her sister Gioia Marconi Braga, who spoke about her father at the 1995 AWA Conference banquet, passed away a year ago at age 80.

I visited with Mrs. Paresce when I attended the Marconi Centenary celebration in Chelmsford, England, last summer. While I was there, the *Essex/Chelmsford Chronicle* of July 25, 1997, wrote about my museum in Bedford N. H. and about my early interest in Marconi. Now 81, I remember my father taking me at age five to meet Marconi on his visit to America in 1922. My father had made a career in wireless communications both in Italy and the U. S. — a link that perhaps led to my career with General Electric, and with my lifelong interest in establishing a Marconi Museum.

Ray Minichiello, The Guglielmo Marconi Foundation, U.S.A., Inc., 18 North Amherst Rd., Bedford, NH 03110

More on AC Line Capacitors

Dear Editor:

Referring to *Radio Miscellanea* in the October 1997 A.R.C., AC line capacitors are also available from Digi-Key Corporation, 701 Brooks Ave., South, Thief River Falls, MN 56701-0677. (800) 344-4539. AC line capacitors are made by Panasonic, and are approved by safety agencies around the world, including UL, CSA, VDE, etc., for use up to 250 volts AC. They are available both in disc ceramic form for smaller values, and in square-cased metalized film form for larger values. Both types have conventional wire leads. AC line safety rated capacitors are recommended for this application, as they are more reliable than standard capacitors in this mode of operation.

Donald Borowski, Spokane, WA

Clock Radio Motor Source

Dear Editor:

Robert Wheaton's article "Clock Radio Repair" (A.R.C. October 1997) gave a splendid discussion on rejuvenating Telechron synchronous motors for those workhorses of the '50s and '60s. Most manufacturers used the Telechron motor movement in field coil assembly. I have identified two types — B and S assemblies, and H, B, and S type rotors.

Before I read the article, I went on a search for replacement motors and, to my surprise, came up with a source: TimeSavers, Box 1270, Scottsdale, AZ 85267. (800) 552-1520. E-mail: clocks@timesavers.com. Before you order, you must remove the old synchronous motor and identify the part number and rpm; this number begins with "M" and is followed by four digits.

Paul R. Hyman, Johnstown, PA

On Radiofest '97

Dear Editor:

I enjoyed meeting you in Elgin at Radiofest XVI. The weather was perfect, the programs insightful, and the friendships eternal.

Lois Rasmusson, Joliet, IL

In the Marketplace A.E.S.'s 1998 Catalog

Antique Electronic Supply, a leading supplier of most new-old-stock and currently manufactured vacuum tubes, has released its 1998 catalog. The catalog has been expanded to 60 pages with lots of new and exciting tubes, parts, supplies, and books. Call (602) 820-5411 or fax (800) 706-6789 for a free copy. You may also visit the company's new web site at WWW.TUBESANDMORE.COM to place orders, browse the catalog, see items not in the catalog, and find answers to frequently asked questions.

CLASSIFIED ADVERTISING POLICY

ONE FREE 20-WORD AD for subscribers in each issue; additional words are 27¢ 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, l and I (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***
27¢ 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:

45¢ per word **plus**
10¢ per word for shaded ad.

Please do not forget to send in the extra 27¢ 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:

38¢ 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):

48¢ 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

\$22.00 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 DEC. 10th
Noon Eastern Time**