

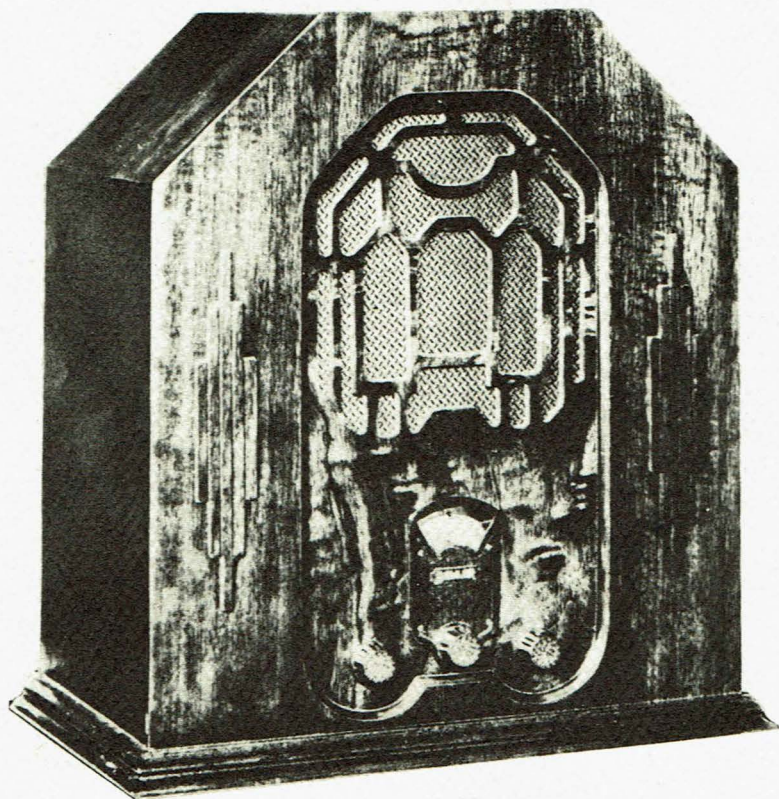
CHRS

official

# JOURNAL

Vol. 6

DEC. 1981



**REMLER RADIO MFG Co.**

CHRS official  
**JOURNAL**  
Vol. 6 DEC. 1981

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Dr. Charles D. Herrold Award:  
Bruce Kelley (1978)  
Joe Horvath (1979)  
Bob Herbig (1980)  
Thorne Mayes (1981)  
Honorary Lifetime Member:  
Paul Courtland Smith (1978)

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THE SOCIETY: The California Historical Radio Society is a non-profit corporation chartered, in 1974 to promote the restoration and preservation of early radio and radio broadcasting. CHRS provides a medium for members to exchange information on the history of radio, particularly in the West, with emphasis in areas such as collecting, cataloging and restoration of equipment, literature and programs. Regular swap meets are scheduled at least four times a year.



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The OFFICIAL JOURNAL of CHRS is published quarterly and furnished free to all members. The first issue (Sept. 1975) is still available for \$3.00; other early issues are \$2.00 each. Articles for the Journal are solicited from all members. Appropriate subjects include restoration hints, information on early radio broadcasts and personalities, anecdotes about the pioneers, etc. Anyone interested in assisting in producing the Journal should contact the Editor.

## THE SCOTT RECEIVER

by Bob Fabris

When you first run across a Scott radio, you are immediately impressed. The multiplicity of tube shields and coil cans, all shiny chrome--the heavy steel chassis and big power transformers, also chrome plated--lots of knobs to play with--two chasses of goodies--well-built cabinetry--the whole thing reeks of CLASS! What's behind it all? First some history, then some description.

Who was Scott? Well, first of all, E. H. Scott was no relation to H. H. Scott. E. H. was born in New Zealand and served in their Army Corps in France during WWI. He sold the rights to an automotive diagnostic device to the U.S. Government and emigrated to Chicago. There he began to write a series of newspaper columns on automotive repair. Becoming interested in radio, he started a column on that subject also, and soon was syndicated in over 100 papers. It was in this column that he originated the idea of the pictorial diagram. The extensive research required for these articles resulted in his creating a laboratory to test and verify the material he was presenting. He became very interested in the reception of very distant programs, and in 1924, he embarked on an ambitious project.

Building a receiver to capture the elusive broadcast signals of Chicago stations, he took the receiver to New Zealand. There, he consistently logged these stations and many others

over a three month stay. Program content was first cabled and then written down and mailed back to Chicago for verification, 8600 miles. No one else had matched the distance capability of his receiver. He was able to receive KNX, Los Angeles--a 500 watt station, consistently. To show that it wasn't a fluke, he had another set of parts sent to him from Chicago, and this second radio operated as well as the first. There was considerable publicity about this in the Chicago area as well as nation-wide and on his return, he made the circuit diagram and technical details of his "World Record 8" available. Creating the matched IF transformers was difficult for the average radio builder, so he went into business to provide them. Then he expanded into providing kits of parts for the entire receiver. At the same time, he was improving the breed, coming out with a 9 tube and then a 10 tube version. The last of the "World's Record" receivers pioneered the Shield Grid tube. All of these were initially battery powered as was common at the time, and he soon added an A.C. power pack. Instead of just having a rectifying system, he included an amplifier stage for loudspeaker volume. These power/amplifier units were mounted on a separate chassis, a concept that was carried on almost to the end. Two or three other sets were produced, such as the 2v battery set and the AC 10.

In 1931, Scott started the production of complete receivers, and brought out the third of the "All-Wave" units, with multi-band capability (but the first so-designated). This initial unit had nine tubes on the tuner chassis, and three more on the power/amplifier, to create the "All-Wave 12" which originated the chrome plated steel chassis tradition. The earliest units

had two dials, as condenser tracking had yet to be perfected--when he did that, he re-issued the set with a single dial configuration, and with the first mechanical coil switching arrangement to avoid the chore of manually changing coils to change frequency bands. As features were added, tube count went up, to culminate in the "All-Wave 23", in 1935.

In 1933, Scott did it again--taking an All Wave Deluxe (the single dial 12) with him to New Zealand. He picked up the Chicago station WBBM (770kc) every night on the ship on the way out and back.

Then in 1938, the line expanded so that more than one type receiver was available at the same time. The Phantom series--which originated the slide rule dial for Scott--the Laureate--the Sixteen--the Masterpiece--the Super XII--all appeared in overlapping production runs. In 1940, Scott incorporated the 44mc FM band into his receivers after a personal demonstration by Major Armstrong in New York. Outstanding at this time was the Philharmonic models. Starting in 1937, this series is considered the apex of Scott's output. It originally was presented as a 30 tube receiver, sporting an eight inch round dial. The dial was split horizontally, and three bands occupied the upper half, three more the lower half. The receiver gave continuous coverage from 150kc to 80 mc across the six bands. At the center was a 360° logging scale. As time progressed, the coverage varied, and as Scott swung into FM, that band also appeared--and a few more tubes to the line-up. The first units had a pointer mounted at the dial's center, and a gold-on-tan dial, but that was changed quite early to the famous spot-of-light, where a series of lamp bulbs behind the green-on-green dial

were caused to rotate by the tuning mechanism. A number of technical achievements were found on Scott receivers, including continuously variable IF; two tuned RF stages and four audio IF stages; AGC in both RF and IF; dynamic range expander (using a "tuning eye" tube); sensitivity, selectivity, signal/noise ratios and tonal fidelity were always at the forefront of technology; always head and shoulders above the masses. Many sets were custom built. The factory would take into account the new owner's location in initial alignment of the variables, add any special controls that were requested, visit the set for fine alignment, etc. And of course, quality of materials and workmanship were unsurpassed. At the lab at 4450 Ravenswood Ave. in Chicago (which building is still standing), Scott had a number of test equipments available to subject his radios to all kinds of adverse conditions. These included a humidity cabinet, reciprocating shock machines, and a copper shielded room. Scotts were popular overseas as well--numerous owners reported excellent reception of all types of short wave transmissions.

The radios not only were guaranteed for five full years for parts and workmanship, but also to outperform any other Allwave type receiver across all bands. Support to the owners included subscription to the house organ and numerous pamphlets on radio reception.

In 1947, Scott produced the 800B receiver, the best of the post-war Scotts. It had a single band of short wave in addition to the regular AM and FM circuits, push-button motor-controlled selection, and usually came in an elegant console with phonograph. But Scott had left the company, and the follow-on 310, 510, and TV units were not up to the standards set by the master, and the company folded in the mid-fifties.

## The Spotlight Collector

by John Eckland

I was born in Palo Alto and have lived there all my life. After graduating from Palo Alto High School in 1971, I went to work for Lowell Smith's Radio & TV shop. At present I work for Perkin-Elmer Corp. as an electronics technician.

My first old radio was a Philco Model 71 Baby Grand, which I bought in 1961 at the Goodwill store in Santa Cruz for \$1.00. I started reading old books on electronics and sought advice from friends. My awareness took a quantum leap while I worked at the Radio-TV shop. I started to find large numbers of early AC sets, in many cases buying them from the original owners, and repairing them. I still prefer to buy radios from the original owners as often the original sales slips and other literature come with the set, and it is interesting to know the history of each radio. I use all of my radios and decorate my home with them together with my collection of Art Deco lamps and appliances.

Over a period of 15 years I accumulated a large number of Zenith and Philco sets, including some rare models, but I disposed of most of these when I became interested in E. H. Scott radios about two years ago. I have kept a Majestic Smart Set table radio, a Victor RE-45 Radio-Phonograph, a McMurdo-Silver Masterpiece V, and about fifteen interesting table radios from the early 30's.

I have always enjoyed popular music from the 20's and 30's in the background of old movies but had assumed all old phonographs sounded terrible until

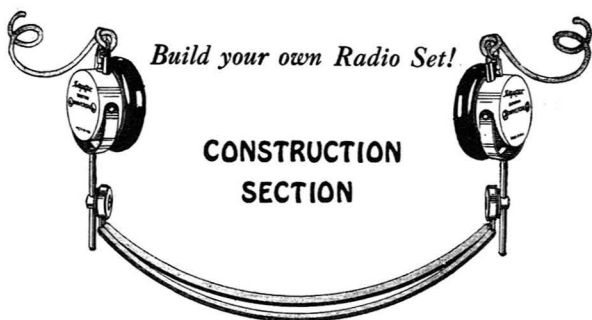
I acquired the Victor RE-45, which sounded excellent. This got me started in record collecting and I began to explore the vast world of recorded music. The cheap dime-store labels from the 20's, like Romeo and Harmony, sound exactly the way 20's radios must have sounded. I like to play records on a machine appropriate to their period; Fats Waller records sound great on my 1936 Magnavox electric phonograph with the Astatic B-1 cartridge and 2A3's in the output.

Other interests include vintage microphones, test equipment, ham receivers, and radio literature.

In the near future I look forward to opening a part-time business restoring vintage radios and vacuum-tube audio equipment. Feel free to call and come by for a visit. My phone number is 415-326-8033.







### THREE-TUBE REFLEX

by Floyd Lyons

About two years ago I came upon a curved glass display case used for Parker 51 pens, which were popular in the early 50's. It struck me, at the time, that it had potential as a glass cabinet for a future home-built receiver. It cost me the hefty sum of \$5. Along comes this idea of a three-tube Reflex that will drive a loud speaker. What is more important, all the components fit perfectly in our prized glass showcase. A photo of the final product is shown here. What we have is a radio made to fit the glass cabinet . . . reverse of the usual approach.

As originally wired, UV-99's were used throughout with no "C" bias; with this setup we were lacking power. So, we changed to UX-120 with "C" bias in the final stage. Just what the doctor ordered.

### PARTS LIST

L1 - L2 Freshman RF Coils  
(green)  
C1 - C2 Dejur .0005 MFD.  
(T1-T2- Acme A-2 AFTs  
T3)  
Xtal. Germanium (1N34)  
2 UV-99 pyrex tube  
sockets  
2 UV-99 tubes  
1 UX plug-in tube  
socket, wafer type  
(sub-chassis mount)

1 UX-120  
R1 - R2 Frost rheostats,  
20 & 30 ohm  
respectively  
1 Toggle Switch, off-on  
2 Phone Jacks, open  
circuit  
C3 - C4 .002 MFD. & .01 MFD.  
respectively  
9 EBY binding posts  
(for A, B, C,  
Ant & Gnd)

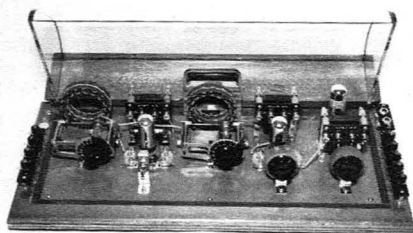


Photo by Floyd Lyons



[illegible]

5

## Restoration Hints

### Brown Cloth Line Cords

If brown cloth-covered line cord is not readily available, one can make a satisfactory substitute by dyeing the gold or white modern cloth cord with a dark-colored wood stain.

--H. Brams

### Intermittent Wire-Wound Resistors

Many intermittent problems in radios arise from defective cloth or metal-covered wire-wound resistors which open up when they become warm. Replace these as necessary.

--H. Brams

### Rattling Speakers

Buzzing or rattling noises in speakers may arise from material that has become trapped between the rim of the cone and the frame of the speaker at the rear of the cone.

--H. Brams

### Hum Problems

If a power transformer is replaced in a set, the sound may sometimes become garbled or a hum be heard. Bypassing the 117 V AC primary leads to ground through 0.01 mfd 600 V capacitors will often eliminate this problem. Also, shielding the lead from the volume control to the first audio tube reduces hum in many sets.

--H. Brams

### Replacing Parts in Philco Radios

Restoration of Philco radios is generally tedious because the capacitors are mounted inside small Bakelite blocks. Removing these blocks leaves holes in the chassis which spoils the

appearance of the set. The following procedure allows one to clean up the wiring to a considerable degree without changing the outside appearance of the set. Cut off the tubular part of the capacitor block through which the screw goes and use these as spacers for mounting terminal strips. Pass the original screw through the strip, then through a lockwasher and then the spacer. Then mount the assembly in the original hole.

--H. Brams

### Rubber-Covered Drive Wheels

The rubber rims of drive wheels can often be replaced by belts or O-rings. There are various sources for these, such as plumbing supplies, tape recorder parts, auto stores, sewing and vacuum repair shops, etc. A good source of O-rings is the R. W. Scott Co., 2345 Fourth St., Berkeley, CA 94710. One should lift the O-ring onto the rim of a wheel rather than rolling it on. Otherwise, it may have a tendency to roll off under use.

--H. Brams

### Loose Tube Bases

Loose tube bases may easily be re-attached to the glass bulb with the new instant crazy glues. The glue sets quickly and no unsightly glue lines remain.

--H. Brams

### Cutting Screws

When a screw must be cut to a certain size, first put a nut on it. After cutting the screw, make the cut end slightly pointed with a metal file, then remove the nut. The screw will now easily enter its appropriate hole.

--H. Brams





## SET OF THE MONTH



By Paul Giganti, W6GVY

Of the many receivers made by Cutting & Washington of Minneapolis perhaps the most rare is the Model 15 One Tube Set. It came from Rockford, Illinois and apparently the collector who had it did not know anything about Cutting & Washington and did not place too much value on it. It is the first one I have ever seen in over 30 years of collecting. It uses a 199 tube as do the other C & W receivers. It is a regenerative type. The panel is unique in that Cutting & Washington used metal rings for dials and these were fixed. In the center of each ring is a knob and pointer. This seems to have been a distinguishing feature of the Cutting & Washingtons. Year of manufacture is approximately 1922.



Photo by Paul Giganti

**Cooper "A" Eliminator**  
Not a Power Unit  
Employs No Trickle Charger  
Operates direct from the  
Light Socket. See Your Dealer

### Frozen Set Screws

If a set screw in a knob cannot be removed, try this. Soak the screw in Liquid Wrench. Clamp a screwdriver in a vise with the blade up. Set the screw onto the blade and twist the knob back and forth. The increased leverage will often be enough to loosen the screw.

--H. Brams

### Frozen Shafts

If a shaft in a control has frozen and will not turn even after a solvent has been applied, heat the shaft with a soldering iron and turn the shaft back and forth with a pair of pliers. This will often free it.

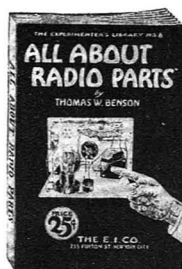
--John Eckland



### WARNING



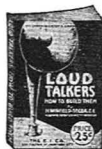
Not many of us spend several thousand dollars for a piece of ancient gear, however, be on notice that a Marconi Multiple Tuner, serial no. 8015, was stolen from the Marconi Company at Chelmsford, England. This choice little item is probably worth about \$3,000 and may have been shipped to the U.S.A. for resale. Contact Dave Brodie if you acquire any leads as to this item.



by Dave Brodie

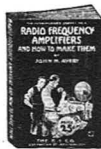
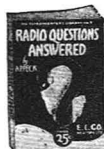
#### BITS OF WIRELESS HISTORY-- G.J. Gray:

This 60 page book was written primarily for the purpose of supplying photographs and descriptions of items in the GRAY HISTORY OF WIRELESS MUSEUM, formerly in Mason, Ohio which is near Cincinnati. It is my understanding that the Museum has been moved to the latter City. This book was published in 1969 and is truly a gem for the collector. The 60 pages are full of information on many of the well-known battery receivers, wireless gear and components. All I can suggest at this time is to be alert and hopefully you will succeed in finding a copy. In the meantime, I am in the process of trying to locate the Curator to determine if copies are still available. If not, I would strongly recommend that we attempt to reach an agreement whereby the publication may be reproduced with proper compensation to the current owners of the copyright. A publication of this quality should be available to every serious collector.



#### HOW TO REPAIR OLD-TIME RADIOS-- Hallmark--\$7.95:

Clayton L. Hallmark has a number of similar publications to his credit including; Understanding and Using the Oscilloscope, Microelectronics, Computerists Handy Manual, and Auto Electronics Simplified. At first glance I was somewhat disappointed as I anticipated considerable emphasis on the well-known battery sets of the 1920's. Although the author's approach is to use the A.C. early sets as a background, there is no doubt that many of us will find this publication to be of considerable value when we dare to extract the chassis of a recalcitrant receiver and start probing for faulty components etc. whether the set be A.C. or D.C. There are 246 pages of information on understanding schematics, specific circuits and their problems, receiver tune-up, testing parts and much more. Incidentally, a New Zealand collector asked my help in getting a copy; otherwise it probably would have escaped my attention. It is difficult to find on the racks of local technical bookstores. However, I finally found out that it is published by TAB BOOKS INC., BLUE RIDGE SUMMIT, PA. 17214. The order number is 1148.



#### VINTAGE RADIO BOOKS:

Most of you have, or are aware of, the series of books published under this title. They are a must for the serious collector or even the less serious! Write for information to Vintage Radio Box 1331, North Highlands, CA 95660.

EARLY WIRELESS--CONSTABLE--  
\$13.00:

All orders received by me to date for this fine publication have been shipped to the members. This book has been described in previous journals and need not be repeated. However, let me remind you that the regular retail price is about \$20.00. We receive a discount if we order in lots of at least five copies. Those of you who have yet to purchase this book may do so by sending a check for \$13.00, payable to me, and I will respond by sending you a receipt and placing your order with the publisher. (See Note below).

A BULLETIN OF "PARAGON" RADIO PRODUCTS:

This is a 16 page reproduction of a publication of Adams-Morgan Company, manufacturers of the Paragon "line" of sets and parts. This item will have limited appeal for those of our membership who are interested in the Paragon sets which, needless to say, are not too plentiful. The booklet includes data concerning the Type 2-5-U radio telephone, the DA-2 detector-amplifier and the RA-10 receiver. The remaining material covers parts made by the Company. You may purchase this from Cecil Bounds, Star Rte. 1, Box 420, Carlsbad, New Mexico. The cost is \$2.95 plus postage of 50c. (Zip code 88220)

Note: D.H. Brodie  
315 Cotton St.  
Menlo Park, CA 94025



WESTERN REGIONAL MEETING  
ANTIQUE WIRELESS ASSOCIATION  
CALIFORNIA HISTORICAL  
RADIO SOCIETY

The 1981 joint meeting of these two Organizations was again held at Foothill College Electronics Museum, Los Altos, CA on May 2, 1981. Assuming that attendance is an acceptable measurement of interest, this year's Meeting was entirely successful.

The registration booth recorded a total of 185 together with 38 sellers. The College parking lot housed the swap meet and Mother Nature contributed a splendid day. As usual, one of the highlights of the day was the old equipment conquest which attracted 35 items of the best in our collections. A complete list of categories and winners is provided below.

The afternoon program proved to be of considerable interest. Thorn Mayes provided an absorbing history of the German Sayville Wireless Station (1913) and Oscar Kusisto followed with a most interesting narration of the growth of the Magnavox Company and the development of auto radios. The program concluded with the annual presentation of the coveted Dr. Charles D. Herrold Award (presented to Thorn Mayes) and recognition of winners in the old equipment contest. We would be remiss without recognizing the leadership of George Durfey in organizing the 1981 Joint Meeting. A job well done, George.

It is interesting to note the growth of interest in the informal dinner held during the evening preceding the

Meeting. Attendance has markedly increased during recent years and there is every indication that this event will continue to expand.

## OLD EQUIPMENT CONTEST

### Class 1--Crystal sets:

- |                      |           |
|----------------------|-----------|
| 1st. Fuller's Sparta | D. Brodie |
| 2nd. G.E.            | K. Parry  |
| 3rd. Lightrite       | A. Bryant |

### Class 2--Regen. receivers:

- |                  |           |
|------------------|-----------|
| 1st. Marconi V2A | W. Baker  |
| 2nd. Grebe CR13  | L. Rayner |
| 3rd. Radiola 93  | L. Upton  |

### Class 3--TRF receivers:

- |                                 |            |
|---------------------------------|------------|
| 1st. Stromberg Carl-<br>son 501 | R. Lindsay |
| 2nd. Atwater Kent 5             | K. Parry   |
| 3rd. Metrodyne                  | J. Duray   |

### Class 4--Superhets.:

- |                     |          |
|---------------------|----------|
| 1st. RCA Radiola 26 | L. Upton |
|---------------------|----------|

### Class 5--Wireless Apparatus:

- |                      |            |
|----------------------|------------|
| 1st. De Forest BC14A | A. Patmore |
|----------------------|------------|

### Class 6--Tube transmitters:

- |                            |           |
|----------------------------|-----------|
| 1st. Utah kit              | H. Meyer  |
| 2nd. One-tube home<br>brew | D. Brodie |

### Class 7--A.C. table models:

- |                            |            |
|----------------------------|------------|
| 1st. 1939 Majestic<br>ship | J. Wentzel |
| 2nd. H.T. Horn             | P. Langlo  |
| 3rd. Philco 90             | W. Boyles  |

### Class 8--Homebrew equipt. (New)

- |                                |          |
|--------------------------------|----------|
| 1st. United Wireless<br>(1907) | T. Mayes |
| 2nd. Crystal set               | H. Meyer |

### Class 9--Homebrew equipt. (Old)

- |                     |           |
|---------------------|-----------|
| 1st. Browning Drake | B. Rogers |
| 2nd. Regen. set     | J. Eckert |
| 3rd. Regen. set     | E. Hooker |

### Class 10--Loudspeakers:

- |                   |             |
|-------------------|-------------|
| 1st. Rola         | J. Reeder   |
| 2nd. Atwater Kent | H. Rowlette |

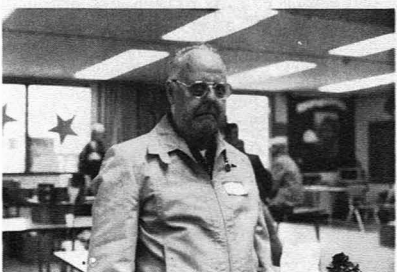
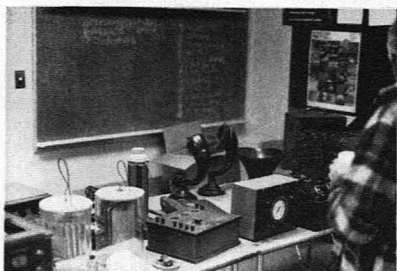
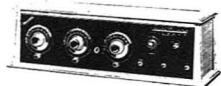
### Class 11--Reflex receivers:

- |                    |           |
|--------------------|-----------|
| 1st. De Forest D10 | E. Sage   |
| 2nd. Lemco         | A. Bryant |

## BEST OF SHOW

MARCONI V2A

W. Baker



## THE 1981 SPRING MEETING OF ARCA

The Antique Radio Club of America held its 1981 meeting at Louisville, Ky. June 4-6, 1981. This meeting is similar in format to the AWA National Conference. (The annual business meeting of ARCA is held during the AWA Conference).

The Louisville meeting attracted 142 members. The program consisted of an old equipment contest, a general auction, a banquet, and a number of technical presentations. Our own Paul Giganti discussed "The Phenomenal Escalation of Antique Radio Prices" and Mel Comer conducted the ever-popular "Show and Tell" program. The auction proceeded smoothly and 27 collectors sold a total of 97 items through the auction. Other presentations included "The Magnavox Story" and the "History of the Sayville Wireless Station"--the latter conducted by our own Thorn Mayes.

Fourteen categories were provided for the old equipment contest which resulted in a large and successful contest. Space does not permit a complete listing of winners and we have therefore selected the following: Crystal sets--Firth; Battery receivers--Industrial Radio Service TRF; A.C. Radio receivers--Swedish Radiola; Scanning Disc Television--Western TV; Superhets (Battery)--Mercury Super 10; BEST OF SHOW--Western Television Scanning Disc.

Auction prices are always of interest, so here goes a few: Aeriola Sr. with brass tube--\$120; Radiola 25--\$50; Kolster--

\$22.50; Freshman Masterpiece--\$25; Freed-Eisemann 15--\$50; MU-1--\$85; RCA 103 Spkr.--\$35; Crosley Triodyne--\$35; Ozarka Sr.--\$32.50; Baldwin Phones--\$18; Clapp-Eastham RHM--\$275; Aeriola Jr.--\$80. (Assuming the condition of these items to be acceptable, it would appear that these prices are definitely lower than one might expect in this part of our Country).

In addition to the attractive program outlined above, those who attended this Meeting enjoyed the hospitality of John Caperton and the opportunity to visit his remarkable Museum which is unquestionably one of the greatest private Museums devoted to antique radios in the United States, if not the entire world.



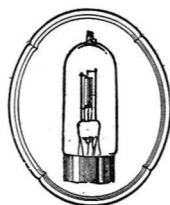
Lowell Thomas Dies

Lowell Thomas, whose nightly radio newscast became the longest-running program in broadcast history, died Aug. 29, 1981 at his estate in Pawling, N.Y. He was 89 years old.

Thomas made his first network newscast Sept. 19, 1930, and did not retire until May 14, 1976--almost 46 years later. His success as a broadcaster was almost immediate, and his audience was soon estimated at 10-15 million. He made the first broadcasts from a ship, an airplane, a submarine and a coal mine. In 1939 he made the first televised newscast. He journeyed to almost every part of the globe, reporting on a great variety of news items, from wars and coronations to describing cannibals in the bush or astronauts in space.

**KELLOGG Radio**  
*Flawless Reproduction*

## THE TUBE COLUMN



By Russ Winenow W6AVG

In the last issue I promised to say more about developments that followed in the wake of the Geissler tube. Scientific American of Oct. 1950 states "It was through the study of electrical discharges in crudely evacuated glass tubes that the effects of the electron were first detected and studied."

In 1878 Sir Wm Crooks investigated these tubes and discovered that streams of particles emanated from the negative terminal. He called these "cathode rays". Later, cathode rays were determined to be streams of electrons.

In 1895 Wilhelm Konrad Rontgen, working as director of the Physical Institute of Wurzburg, discovered that when streams of high speed electrons collided with a solid body in discharge tubes, high frequency radiation was produced. He gave these the name "X rays".

Early X ray tubes were similar to the one shown in Fig. 1. They were built with two cold electrodes and contained a small amount of gas. A high direct potential was applied to the electrodes causing the gas to ionize. Electrons released from the ionized gas were drawn to the positive element (anode). Impact then caused X rays to be produced. Early tubes had an additional but smaller anode sealed near the top of the tube which was

externally connected to the main anode. This was supposed to prevent excessive strains in the glass or somehow to regulate the amount of X rays produced. The better tubes were equipped with an arm containing a small amount of gas-absorbing material to maintain the gas at the desired pressure. In practise, gas was slowly absorbed by this material until the vacuum became too high, at which time the material could be heated until enough gas was driven off to restore the required pressure. The intensity of the X rays was varied by changing the voltage; however, this did not always provide consistent results.

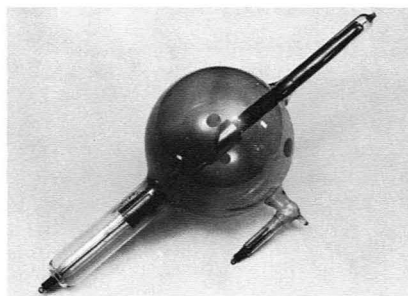


fig. 1

photo by George Durfey

In 1913 W. D. Coolidge made a major improvement in the X ray tube by using a heated tungsten filament as the cathode. The hot filament provided a more abundant supply of electrons and allowed greater control by the simple means of regulating the temperature of the filament. In this case the tube was exhausted to the fullest extent possible. The gas was no longer required since the electrons were provided by the filament alone.

A more comprehensive description of the uses of X rays can be found in ref. 1.



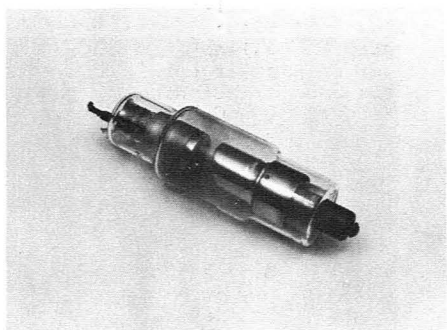


fig. 2

photo by George Durkey

Fig. 1 Early X ray tube, made before the "hot cathode" type (Victor # 61118).

Fig. 2 Modern X ray tube used in dental work (Eureka 6-11-SP-6 #3213)

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- 1--Matter Energy and Radiation  
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- 2--How to Understand Electricity  
Collins--Lippincott 1943
- 3--Practical Electricity  
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- 4--Fundamental Theory of  
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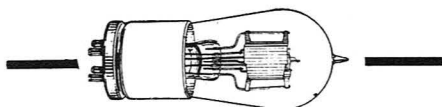
6--High Frequency Manual  
Eberhart--New Medicine  
Publishing Co. 1916  
(Very good pictures  
and description of medical  
equipment)

7--Fundamentals of Vacuum Tubes  
Eastman--McGraw Hill 1941

8--Electricity of Today  
Gibson & Seeley--1915  
(Interesting pictures of  
medical X rays and early  
equipment)

9--Magnetism & Electricity  
Brooks & Peyser--Longmans  
Green 1914  
(Not much on X rays but  
has a very good chapter on  
early Light bulbs and  
description of the Nernst  
Lamp. Also it is interest-  
ing to note that in some  
of the early lamps the  
filaments were of Tantalum.  
This semi-precious metal  
is today used extensively  
in the manufacture of  
capacitors for electronic  
equipment)

10--Elements of Radio  
Marcus & Marcus--Prentis  
Hall 1959.



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## The Remler Co.

by Alan S. Douglas

The story of the Remler Company starts with Elmer Tiling Cunningham, of Audio-Tron and RCA vacuum-tube fame. In fact the name "Remler" is derived from "Elmer" spelled backward with an extra "R" for Radio. Biographical material on Cunningham is remarkably hard to find for a personage of his importance in the radio industry, and two people in a position to know have told me that his reputation, both business and personal, was not altogether savory. Since I have no specifics, I'll leave it at that.

The first mention of Cunningham I've seen is a 1910 book "The Tesla High-Frequency Coil" co-authored with George F. Haller (who was, I'm told, not of the same character as Elmer). A year later the two men opened a retail store at 428 Market St. San Francisco; across the street in a warehouse loft they manufactured their equipment. In 1913 two others joined Haller-Cunningham Electric Co.: Thomas B. Gray salesman, and Ernest G. Danielson as engineer. By 1915 Cunningham was on his own, making AudioTron vacuum tubes. History becomes a bit fuzzy in this period, but in early 1918 Gray and Danielson left H-C to form their own company, on the 4th or 5th floor at 579 Howard St. H-C may have had a financial interest; they also at some point changed their name to Halcun Radio Co. Cunningham also founded Remler Co. in 1918. Haller is said to have formed a company to make Bakelite moldings for Remler. In 1920 Haller-Cunningham went bankrupt, with liabilities four times their assets. Haller became a professor of science at San Jose State University.



RCA News, May 1931

In January 1921 Leo J. Meyberg was advertising as the successor to Haller-Cunningham Electric Co. So ends Haller-Cunningham, as we pick up the story of Remler from 1918.

Elmer Cunningham was for a time the sales manager of Remler, but seems to have had little association with the company after about 1922, and in fact was probably occupied fully with his vacuum-tube ventures with RCA, which have been recounted in Tyne's "Saga of the Vacuum Tube." Remler appeared to prosper for a few years: they advertised regularly, they were said to have employed 100 men in November 1922, and their products turn up frequently today. Their first ad in Radio News was in February 1921, for components; in March their detector panel appeared; in September their molded variometer; and shortly a whole line of matching panel-mounted components and detector-amplifiers. These panels were still being sold in 1923.

In May 1924, RADIO magazine published the first in a long succession of "Best" 45kc superhets, built around Remler parts. Best's circuits were in vogue for several years, but Remler shortly took a turn for the worse. Their last ad was in May 1925 and the latest Best circuit in September 1925 RADIO did not specify Remler any longer. At some point, Remler was bought by Gray & Danielson (remember them?) and made a division of their company.

Gray & Danielson, who had apparently concentrated on shipboard radio gear up to 1926, entered the broadcast market under the Remler name with a series of components. E.M. Sargent's "Infradyne" boosted their sales considerably when it appeared in August 1926; it was a superhet whose IF was higher than the broadcast band, rather than lower, and it used a Remler IF amplifier.

In May 1930 a fire wiped out the 260 First St. factory, but by July Gray & Danielson were in a new building at 2101 Bryant St., where they were to remain for about forty years. There was yet another name change, though--in January 1931 Remler Co., Ltd. was formed to take over Gray & Danielson, with the same personnel. Tom Gray died in December 1931.

Remler survived in the early 1930s by making low-priced midget radios. Their first entry was the Cameo, model 14, in September 1930, followed in January with an 8-tube superhet, model 17. A 7-tube super came out in July 1931, and by November 1932 Remler was offering four models: the 10, 15, and 21 in two cabinets.

In August 1931 Remler offered a condenser microphone, the first in an expanding line of

audio equipment. While I have not made a study of the company in this period, they seem to have made radios all during the 1930s. Remler is still in business today. My letter of inquiry to them went unanswered and I didn't follow it up, but if a closer-by member could contact them, he might be able to put some "meat" on the "bare bones" of this story.

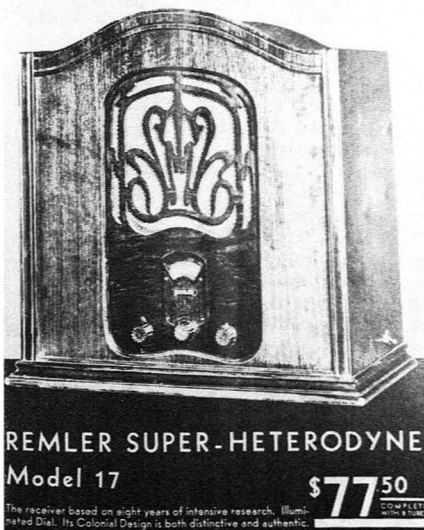
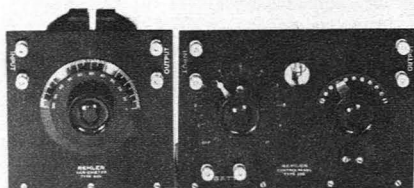


photo by Alan Douglas

## Uncle Joe's Super Selective Tuner or Crystal Set.

By Joe Horvath

First a few words about crystal sets is in order. The antenna system and only that determines just how much signal you will have in your headphones as there is no amplification whatsoever in a galena diode detector. The ideal antenna for the greatest signal pickup is the full wave horizontal antenna. However, for the broadcast band, the antenna would have to be 990 feet long at 1000 KC. Very few of us can erect an antenna of that size. So we have to compromise. This is where an antenna tuner comes in. An antenna tuner tunes the antenna to peak efficiency at any station within the broadcast band, even if you only have an antenna 50 feet long. Of course, an antenna 150 feet long would be much better as it would feed a stronger signal to the headphones. In the accompanying diagram, my tuner consists of L-1, C-1, and the six tap switch points.

Next, how selective do you want your set to be? If you live close to a 10 or 50 KW broadcast station you will need plenty of selectivity to prevent the strong station from spilling over into an adjacent weaker station that you want to tune in. So I have added a band-pass circuit, consisting of L-2 and C-2, that will separate all of your stations, even a 50 KW station only a few miles away. As you will note there is no mechanical connection between this circuit and the tuner. It's strictly inductive. Signals pass thru it only if it's tuned to the same frequency as the antenna tuner; it's very, very selective.

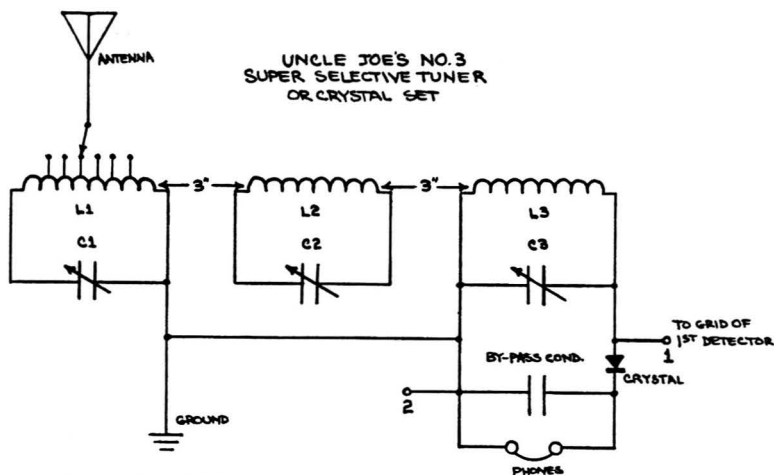
The third circuit, consisting of C-3, L-3 also tunes to the same frequency as the antenna tuner and the bandpass tuner; this circuit adds still more selectivity.

So a person can decide on how much selectivity he will need at his location. If you are far from any broadcast station then all you have to use is the antenna tuning circuit of C-1, L-1 and connect the detector circuit to the antenna circuit as shown and marked as #1.

If you need a little more selectivity but still are not too close to a 50 KW station, then just merely eliminate circuit C-2, L-2 and use C-1, L-1 and C-3, L-3 only.

As can be seen this is a very versatile arrangement of circuits, which if one wants to, can also be easily used as an antenna tuner for almost any old time radio receiver. It would be ideal to use as an antenna tuner for a W.E.4B receiver. There are many of these 4B's around with no loop antenna or antenna tuner. All that has to be done is connect #1 in the C-3, L-3 circuit to the antenna post, detune entirely the antenna condenser in the 4B, lift the catwhisker and connect the ground terminal. You now have really a first-class tuner for your set. This same method can be used on almost any set that doesn't have a good front end tuner.

In order to drive a loud speaker, a transistorized amplifier can be built that will amplify the signals from a crystal set without using any outside source of power of any kind, such as batteries or power supply. However, the crystal set must deliver at least one half volt of signal, which is an awful lot of signal, before the transistor will



schematic drawn by Scott Welch

start to self-amplify. Very few people can erect an antenna system that will deliver that much signal and it would only be on one or two stations at the most.

For the complete tuner and crystal set you will need the following:

- 3-Variable condensers, 43 plates.
- 3-Dials to match.
- 3-Low Loss coils, 45 turns  
3" diameter, #22 DCC wire.
- $\frac{1}{4}$ " wooden dowel 15" long.
- 1-7"x15" panel.
- 1-6"x15" base board.
- 6-tap switch points.
- 2-tap switch points stops.
- 1-tap switch points arm.
- 1-Crystal detector holder.  
With a GOOD galena crystal.
- 1-Phone bypass condenser.
- 3-Binding posts.

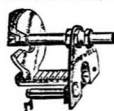
Using good material is very important. The coils I made as described in my recent article in the Journal. They are Low Loss basket weave type. As you see in the photo they are easy to mount on the wooden dowel, but a person can use any good type of coils.

The photos clearly show the construction. The coils must be mounted exactly as shown. This is very important.

When tuning this set one will have to log the dial numbers as this tuner is very selective. But once logged, the station is there each time. Use the antenna tap that gives you the best signal, log this also. If you are using a good antenna system also include a good ground. Have fun and good luck!

--Joe Horvath

MIDGET CONDENSER  
The midget condenser shown, submitted by the



Allen D. Cardwell Mfg. Corp., 81 Prospect St., Brooklyn, N. Y., is sturdy and compact. It has a maximum capacity of approximately 20 mmf. and extremely low minimum.

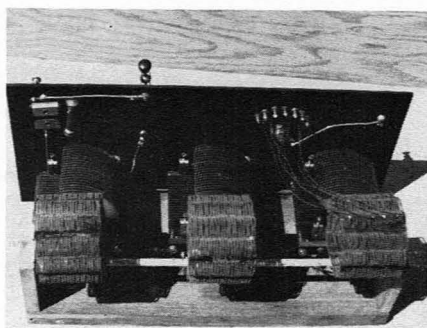
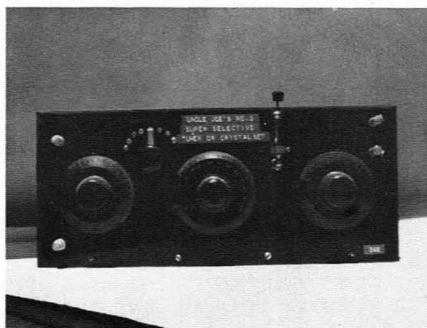


photo by Joe Horvath

## COLORS OF GAS DISCHARGE TUBES

### Gases

Argon	-----Blue
Carbon dioxide	---White
Helium	-----Yellowish- white
Hydrogen	-----Pinkish white
Krypton	-----Purplish white
Mercury	-----Blue-green
Neon	-----Red-orange
Xenon	-----Sky blue

### Metallic Vapors

Boron	-----Green
Cadmium	-----Red
Copper	-----Green
Zinc	-----Blue-white

### References:

- "Neon Signs"--Miller and  
Fink (1935)  
"Spectroscopy"--Baly (1922)

----Floyd Lyons

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AERIAL



GROUND



COUNTER-  
POISE



VARIABLE  
CONDENSER



VARIABLE  
CONDENSER  
(MOVING PLATES  
INDICATED)



TRIPLE  
VARIABLE  
CONDENSER  
(SAME STYLE  
FOR DOUBLE  
OR QUADRUPLE)



SEPARATE  
VARIABLE  
CONDENSERS  
OPERATED  
TOGETHER



FIXED  
CONDENSER



CONDENSER  
BLOCK



R.F. INDUCTOR  
(MAY BE  
R.F. CHOKE)



R.F. INDUCTORS,  
COUPLED.  
(R.F. TRANSFORMER)



INTERMEDIATE-  
FREQUENCY  
TRANSFORMER  
OF A SUPER-  
HETERODYNE.



CONTINUOUSLY  
VARIABLE  
INDUCTOR  
("VARIOMETER")



TAPPED  
INDUCTOR

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FREQUENCY  
INDUCTOR  
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AUDIO-  
FREQUENCY  
TRANSFORMER



PUSH-PULL  
AUDIO-  
FREQUENCY  
TRANSFORMER



FREQUENCY  
METER  
(WAVEMETER)



FIXED  
RESISTOR



VARIABLE  
RESISTOR



VOLTAGE  
DIVIDER  
(POTENTIOMETER)



FILAMENT  
BALLAST



THREE-  
ELEMENT  
VACUUM  
TUBE



THREE-  
ELEMENT  
VACUUM TUBE,  
A.C.-HEATED-  
CATHODE TYPE.



SHIELDED-  
GRID  
TUBE



HALF-WAVE  
RECTIFIER  
TUBE;  
FILAMENT  
TYPE



FULL-WAVE  
RECTIFIER  
TUBE;  
FILAMENT  
TYPE



FULL-WAVE  
RECTIFIER;  
FILAMENTLESS  
TYPE



TWO-  
ELEMENT  
VOLTAGE  
REGULATOR TUBE



THREE-  
ELEMENT  
VOLTAGE  
REGULATOR TUBE



CONNECTION  
BETWEEN  
WIRES



NO  
CONNECTION



TELEPHONE  
JACKS



FILAMENT  
SWITCH  
(S.P.S.T.)



LIGHTNING  
ARRESTOR



ELECTROLYTIC  
RECTIFIER



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MICROPHONE  
TRANSMITTER



D.C.  
GENERATOR



ALTERNATOR



TRANSMITTING  
KEY



LAMP



ARC



BUZZER



THERMO-  
ELEMENT



PHONOGRAPH  
PICK-UP,  
MAGNETIC  
TYPE



PHONOGRAPH  
PICK-UP,  
CAPACITY  
TYPE



LIGHT BROKEN  
BORDER TO  
INDICATE CASE  
CONTAINING  
APPARATUS  
SHOWN BY  
SYMBOLS.



LAMP-SOCKET  
PLUG,  
110-VOLT TYPE.



PLUG  
RECEPTACLE  
110-VOLT TYPE



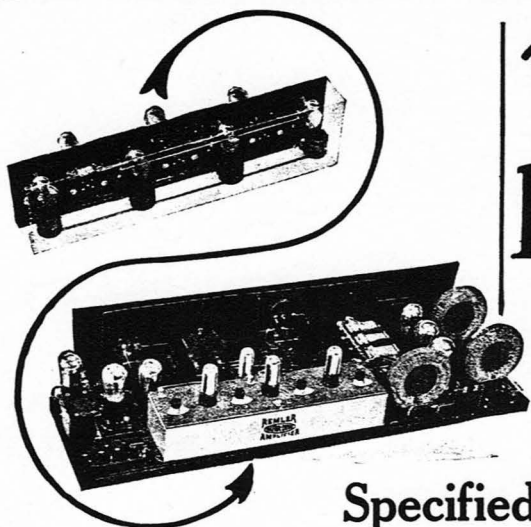
HEAVY  
DOTTED LINES  
TO INDICATE CASE  
GROUNDED  
SHIELDING



PERIDYNE  
SYMBOL



LIGHT LINES  
FOR R.F. & A.F.  
CIRCUITS.  
HEAVY LINES FOR  
FILAMENT &  
110 V. POWER LEADS,  
(TO INDICATE HEAVY CURRENT)



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THE REMLER No. 700 Infradyne Amplifier is a product of advanced radio research. It retains every advantage of multi-tube amplification at a fixed frequency and eliminates undesirable features present in other receivers of this general type.

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Inductance Coils and Condensers are designed and constructed to meet the exact requirements of this circuit. REMLER New and Improved Sockets insure absolutely clean and positive tube contacts. Maximum efficiency of operation is obtained by scientific arrangement of parts and wiring, which prevents energy leakage.

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E. M. Sargent's Infradyne article, reprinted from Radio Magazine, together with a special two-color descriptive folder, will be mailed free upon request.

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IMPROVED  
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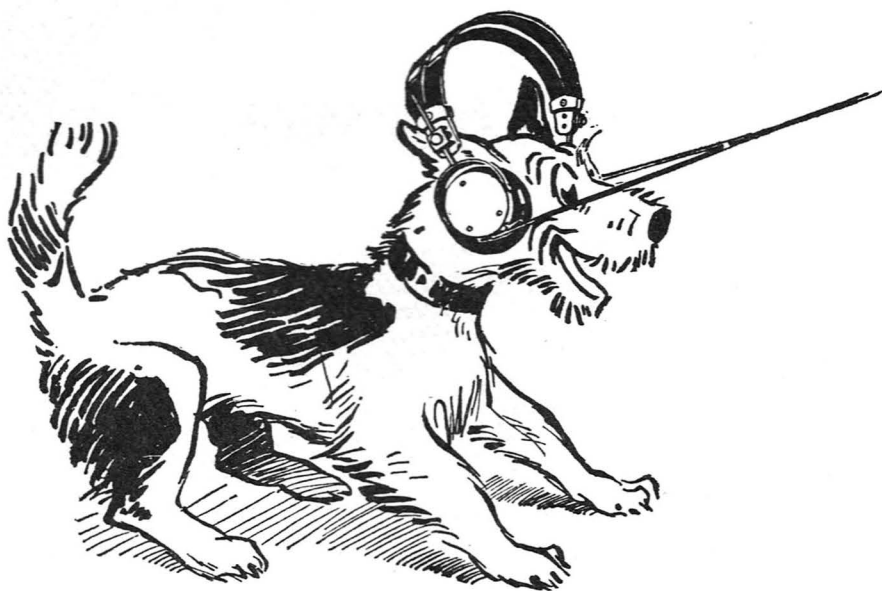
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- 3 Reception on one setting only of each dial.
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