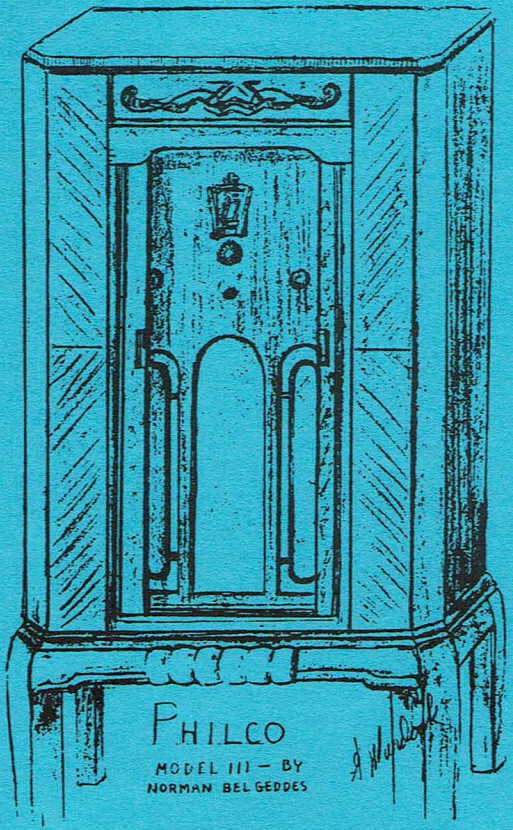
# CALIFORNIA HISTORICAL RADIO SOCIETY

# JOURNAL

VOLUME XII - MAY 1988 - NUMBER II



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The California Historical Radio Society is a non-profit corporation chartered in the State of California, and was formed to promote the restoration and preservation of early radio and broadcasting. Our goal is to provide the opportunity to exchange ideas and information on the history of radio, particularly in the West, with emphasis in the areas such as: collecting, literature, programs, and restoration of early equipment. The *Journal* of the CHRS is published quarterly, alternately in printed and audio tape format, and is furnished free of charge to members. Yearly membership dues are $12.50.

**Production notes:** This issue of the *Journal* was composed on a Macintosh SE computer using Microsoft Word, version 3.02. Camera-ready copy was produced on an Apple Imagewriter LQ printer. The Times and Chubby-Shadow fonts were used. Comments and suggestions, articles, stories, classified ads, and other material for the *Journal* are welcomed and should be submitted to the Editor at least 60 days prior to the cover date.

**Fine Print:** The enclosed membership directory addendum covers members who have joined or renewed since the directory was printed in late January 1988. **NOTICE: The Directory is published with the intent for personal use only, enabling members to contact others with similar interests. Commercial use of any kind, whatsoever is strictly prohibited. Please adhere to this stipulation, determinations that are made to the contrary will result in permanent revocation of membership privileges.**

# From the President

*Paul J. Bourbin*

Since my last message, many activities have occurred. The February meet at Foothill College was the largest Winter meet to date, with over thirty-six sellers and a very large number of buyers in attendance. The Gods must be with CHRS as it rained just before and just after the meet. The San Luis Obispo meet in March and the Concord meet in April were quite successful as Regional meets. About 25 sellers were in attendance and a lot of the general public as well as regular collectors attended due to the large amount of publicity about the meets. Thanks to Dan Steele who hosted the San Luis meet and to George Murdock who hosted the Concord meet. The Concord meet could become an annual event. The owners of the drive-in theater want to have us back. The next meet will be at Foothill College on 14, May, which will be the same day as the Ham/Electronics swap-meet. Hopefully, this will encourage attendees of either meet to visit both meets to the benefit of all. This will also occur at the August meet. We are trying this dual-meet idea out and if it is successful, it can be repeated next year. Please let me know your thoughts on the subject. The next Regional meet will be at St. Anne's Church School Playground, Irving and Funston Streets, San Francisco on 16, July. As this meet is located near many forms of public transportation, it is hoped that members and friends who cannot drive, or otherwise attend the regular meets will be able to attend this one. More information will follow. Speaking of swap-meets, I have received many complaints lately concerning the statements of condition of sets sold by various sellers at our meets. Buyers, many of them novices or the general public, were told that a set worked (often the word "perfectly" was included) and upon taking

the set home found out that it did not. In fact, in one case, the set started smoking and almost caught fire! A set with which one can barely hear the stations play over the hum, is not, in my opinion, a working set. A set with blown tubes is not a working set. A working set is one (again, my opinion) that plays as well as when it was new or nearly new, gets local stations on the broadcast band and at least some of the strong short-wave stations on that band (if the set has one or more) and has no more hum or distortion that the set had when it was new, or nearly so. I have had to repair some of these radios in order to maintain the good name of CHRS, at my expense. I realize that there are no accepted standards of condition, but this does not permit outright deception. The edict "Caveat Emptor" is an admonishment to the buyer to investigate the item that he wishes to purchase and to ask proper questions of the seller. It is not a license to lie. Otherwise, old radio sellers will get the reputation and stereotype now held by used car dealers. This is not healthy for a hobby that is supposed to be fun and fraternal. Novices are turned off by such deceptions and will not return to buy more radios and may warn their friends of the bad experience they had at an old radio swap-meet. The general public does not have the access to parts and repairmen that we have. They want a safe reliable set that will work for a fairly long while. Most sets, properly restored, will do this. A set which is just patched together to barely play will often fail soon after purchase.I realize that many collectors have many sets that rarely get more than two hours worth of use in a year, but someone who has only one or two sets may use them a lot. While any old set can develop some problems, at least the seller should feel honestly that the set should give reliable service. The failure rate that I have seen is too large for random chance to permit. If the trend continues, I shall feel compelled to publish the names of those who have chronically sold sets whose condition is

over-rated. I have no quarrel with those who sell non-working sets and the buyer knows such or that the set is "untested" (who doesn't at least try the set to see if it plays?), only those who overstate the working condition of the set. I welcome comment and will publish letters of those who write on this subject.

The next membership meeting will be on Wednesday, 25 May. All members (especially officers and board members) and friends are invited. Door prizes will be given. With our membership having grown to about 225 members, we should have a good turnout for the meetings. In case you have forgotten, the meetings are now held at the Electronics Museum, Foothill College, Los Altos Hills and starts at 7:30 PM. Please plan to attend. The meeting for June will be on the 29th and for July on the 27th.

The July meeting will be the beginning of the nomination process. Nominations for President, Vice-President, Secretary, Treasurer, Membership Secretary, Board Chairman, Board Members, Publicity and PR person, recipients of the Herrold Life Membership awards. Nomination forms will be sent out to all members for nominations during the month of August. Election ballots will be sent out during the month of September and the ballots will be counted at the September meeting. It is time to start thinking about who you ant to be officers of CHRS for the next year. Due to mounting responsibilities, I will not be able to run for President again. I will not accept the nomination for that position. It has been a most interesting two and a half years. I have accomplished most of what I wanted to do, vis: to get CHRS back on its feet and running reliably and smoothly. I would have done more if I were not burdened with the day-to-day tasks of maintaining CHRS. Now it is time or someone else, perhaps with more charisma, to take over and make CHRS

even better than it is. Remember, if you accept the nomination and are elected, you are required to attend the monthly membership meetings and any other special meetings as required. A large number of members have said that they want CHRS to continue and to do this and that. Now is the time for people to put time and action behind those words.

There has been discussion about the possible merging of CHRS and SCARS to make one large West Coast club with semi-autonomous branches. There would be one dues and one publication. Meets would be held at both locations. Other West Coast clubs would be asked to join. Please let me know your thoughts on this matter. There are many details which will need to be worked out if it is to happen. Let me know if this something that you want.

That's it for now. Congratulations to Robert Johnson for winning the 1912-1913 Ham License Test Contest. Remember you can always write or call me at: 25 Greenview Court, San Francisco, CA 94131 or call (415) 648-8489. Thanks.

# An Inexpensive Cone Type Loudspeaker

## The Latest Type of Conical Loudspeaker, Designed for the Experimenter with a Modest Purse

Many ardent radio fans will be indebted to *Jay Hollander* for the construction data of this cone type speaker without the necessity of pledging the family jewels. Mr. Hollander tells his story in *Radio News,* New York, as follows:

Ever since the appearance on the market last season of the cone type loud speaker with paper diaphragm, it has taken the premier place among such apparatus and has proved to be the be reproducer of speech and music to put in an appearance on the radio market.

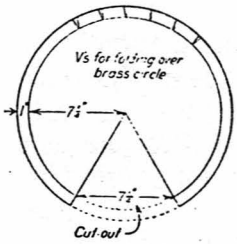
But the price of the commercial types is pretty high, high enough, in fact, to make them almost out the reach of the ordinary fan. For some time the contemplated the problem of getting together sufficient cash to but one of these units, and finally, having discovered that such was almost impossible, decided to build one as the only possible way in which he might get the desired purity of tone from his radio set. (He has, of course, a resistance -- coupled radio amplifier on a super-het.)

Having purchased a great deal of his radio supplies at the five-and-dime, he was wandering over near the radio counter one day, dreaming of the cone loud speaker, when he was hit by the great idea. Here it is: On that counter is a lamp shade; here is a candlestick; there's a lot of drawing paper at home and an old receiver-ergo, the great corporation won't get thirty "bucks" out of me and I'll still have a cone loud speaker.

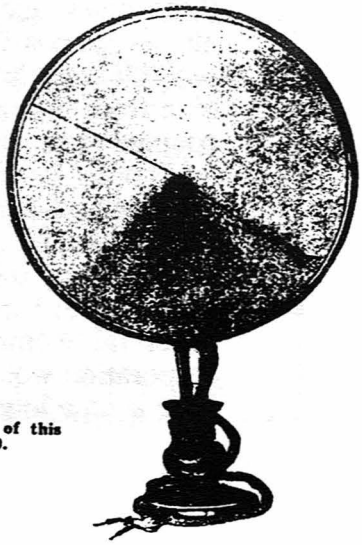
Here is how the trick is turned: The lamp shade gave the idea, the remainder was simple. The details follow. First secure a piece of heavy brass sheeting and cut a strip one inch wide and about 37 inches long - this dimension is for a cone about 12 inches in diameter, which is a good size. For perfect reproduction, any smaller size will not give the best results. As a matter of fact, if absolutely perfect reproduction is desired, the cone would have to be at least eight feet in diameter. This is out of question, however, and for smaller sizes we must depend upon the formulation of harmonics for the reproduction of the very low notes.

Back again to the construction. After the strip of brass has been cut, it is rolled into as nearly a perfect circle as possible. The ends are connected by soldering a small piece under them.

The supports are then made for the phone unit. These consist of three or four heavy wires, soldered to the underside of the ring and run in toward the center, where they are again soldered to a second brass ring much like the first, except that its diameter is such as to fit snugly around the case of the unit to be used.




The layout of the paper cone which forms the vibrating member of speaker.



Front of loudspeaker. The total cost of this speaker should not exceed $5.00.

This second ring need not have its ends soldered together, but it may have a jumper fixed around the rear and equipped with a set screw for adjusting the tension of the diaphragm. The writer tried this idea on is first speaker, but found it unnecessary for good operation.

The cone is then made. If the diameter of one foot is being adhered to, the cone must be 8 1/4 inches in radius. This gives the completed cone a pitch of about four inches, deep enough for practice. After the circle is cut, another circle is marked with a radius on inch less; this marks off the points at which the paper is to be folded over the brass ring. Now, on this dotted line measure a distance across a chord of 7 1/4 inches. This marks the points at which the paper is to be cut to form the cone. Lines are drawn through these points to the center and then the paper is cut along them.

For fastening the paper to the brass ring, small V's are cut in the edge about every thirty degreed around the circumference from the edge of the paper to the dotted line, which is one inch closer to the center. A large number of very small V's will give better results than a small number of big ones, so do not be afraid of cutting the V's.

The writer used an extra good grade of photo-mounter paste to stick the paper to the brass ring, and it served its purpose excellently. Shellac. however is better. Some trouble may be experienced with this operation, but a few trials will give a good idea of the best paste to employ.

Following the completion of the speaker thus far, the next point is the installation of the connecting rod between the cone and the unit which is to be employed. A piece of bus bar will serve admirably, if there is not and available piece of brass rod around the work-bench. The matter of attaching it to the diaphragm of the phone is very simple. Be careful that a good, tight connection is made, but at the same time, the area covered by the connection is as small

as possible. That is to say, see to it that the solder used covers as little of the diaphragm space as possible.

The attachment to the cone is not quite so simple a matter. The writer used two small brass cones two inches in diameter, one the outside of the apex of the paper cone and the other on the inside. Then the connecting rod was attached to these cones with a suitable threaded end by means of nuts.

Those who do not care to spend the necessary time to make the other pair of cones and the threaded rod may use the bus bar and a bit of well-spread sealing wax. The end of the bus bar may bent to lie flat on the outside of the cone. Then the attachment is made firm by dipping about two inches of the surface of the cone into melted sealing wax. A little practice will enable the builder to swing the cone into the wax so that a most workmanlike job results. The final touch is added by placing a few drops of the wax on the inside of the apex of the cone where the wire comes through.

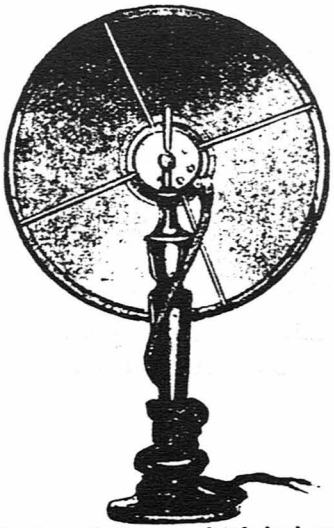
Now for the unit. The second brass ring was made to fit snugly around the outside of the receiver case. The receiver slips into this and the diaphragm when the extension is installed. Remember that if the connections to the cone and the diaphragm are not made at the absolute right angles, trouble in plenty is liable to result. The sounds of the Philharmonic Symphony coming through will resemble nothing so much as a hurdy-gurdy around the corner if the angles are not right.

Nut for arguments sake, let's assume that they are as they should be and go ahead with the discussion. If the second stage of the amplifier is husky, the cone will not help any in the matter of clarity of reproduction if the phone is used as is. The chances are that the diaphragm will constantly rebut itself against the pole pieces of the magnets, giving a nice, metallic twang. This is corrected by the installation of a couple of thin shims of copper or

brass placed between the edge of the diaphragm and its bearing around the receiver case.

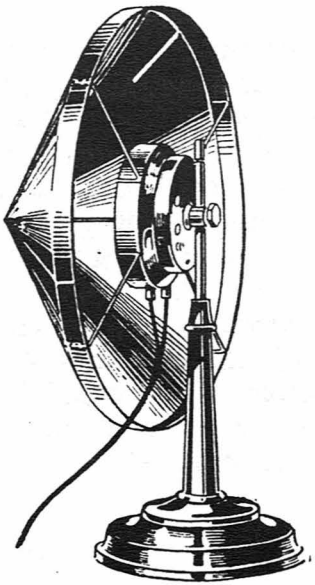
The thinnest possible metal sheet should be used for this purpose. If the is some old shielding material around the house, it will come in handy. Cut two or three circles from it just to fit the edge of the receiver case where the diaphragm rests. A few trials will give the the proper number of then to be employed. Keep the diaphragm as close as to the pole pieces as possible, so long as it does not strike when the town's prima donna takes her high C.

Now for the finishing touches. In the dime store mentioned in the first paragraph, at the lamp counter, will be found a great assortment of decorative ribbons which are ordinarily used to bind the edges of home-made lamp shades. A little of this will cover the edge of the brass circle where the paper cone was pasted to it. This enhances the appearance of the completed instrument several per cent., making it look even more like the thirty dollars saved. [*Reprinted from Radio Review, Sept. 1925 pp47-48*]



**Back view of the completed loud speaker mounted on a candle stick.**





*Illustrations by Courtesy Radio News (New York)*

**Above is a clear schematic constructional diagram of the loud speaker.**

# PHILCO 1931
## by George Murdock

Superlative is the only way to describe this set [front cover drawing], one of the first Superheterodyne Philco consoles. The cabinet, designed by *Norman Bel Geddes* (a famous furniture designer of that period), is one of the most beautiful pieces of furniture that we have ever seen come through our shop.

The exquisite burl front and sliding doors open to reveal an eleven-tube superheterodyne receiver with push-pull audio output, tone control, and two tuned R.F. amplifier stages. A twelve inch electrodynamic speaker, mounted on a rim of felt, produces exceptional tone quality, so good, that it rivals high fidelity sets. The eleven-tube chassis, with its one hundred seventy-five kilocycle three-stage IF amplifier, produced the most outstanding selectivity we have encountered. The set will separate a local station at 1480 Kc from a weak distant station at 1470 Kc, with no crosstalk, which no other radio that we have or that we have seen, will do. The sensitivity is not to be believed. Reception from distances two thousand miles are the rule, instead of the exception, and even foreign countries have been heard on the standard broadcast band.

On the top of the cabinet there is a very ornate, hand-carved scrollwork that lends the cabinet to fit with modern or traditional decor.

The tube line-up is two 71A output tubes, five 24A RF and IF amplifiers, three 26's, being detector, first and second audio amplifiers, and one type 80 rectifier.

We cannot place a value on this receiver, because it was outrageously expensive in 1931, during the great depression, and very few were made, and even fewer exist, still, today.

# 1912-1913 Ham Radio Operator's Test: Answers

*In the November 1987 issue of the CHRS JOURNAL a contest appeared, with a prize of $25.00 and a copy of D.H. Moore's Sketchbook, Volume Eight was to be awarded to the member that submitted the most correct answers. Hat's off to Robert Johnson, the contest winner, and to Hal Layer who supplied the questions and answers.*

1. A meter is a machine that transforms electrical energy into mechanical energy. A generator is a machine that transforms mechanical energy into electrical energy.
2. Meter armature; commutator; brushes; fields; meter field rheostat; starting box; generator; collector rings; fields; generator field rheostat; bearings; oil rings; thrust bearings, etc.
3. The function of a commutator is to maintain the polarity of the magnetic flux of the fields, and the armature core in such relation to one another that there will be a constant attraction between the magnetic fields causing rotation of the armature.
4. The starting box is composed of a number of resistance coils connected in series, these coils are connected to a number of metal contacts which are fastened to the face of the box in the form of a circle, a lever is so arranged so as to pass over the starting box is a small electric magnet connected in series with the meter field which holds the handle of the starting box over while the meter is running; if one step of the coil of the starting box should burn out, connect the burnt out step with the one next to it.
5. A salt water rheostat could be made.

6. If a motor is started too slowly it is likely to burn out at the starting box; if started too fast you are liable to blow a fuse or trip the circuit breaker. The correct way to start the motor is to pull the handle over so that there is a minimum sparking at the brushes of the meter or starting box.
7. D.C. supply may be shut off temporarily. It is also probable that the shunt field of the face of the starting box was shorted or the shunt field was too weak to overcome the tension of the spring and would not hold the handle over. If the D.C. is found to be OK, you would tie the handle over and care should be taken to release the handle immediately after completing the work required. If the D.C. should be shut off while the handle is tied over and suddenly thrown on the motor, damage would result.
8. They are strictly prohibited.
9. The wave-length of the station called.
10. Ask the captain your position, then look up your radio chart.
11. By means of International Code.
12. PRB; QRA; QRB: etc.
13. I wish to communicate by means of the International Code.
14. The cable count which includes everything from the prefix up to and including the signature.
15. Three times at the request of the receiving station.
16. Six hundred meters.
17. Messages may be divulged to no one except the persons to whom they mat be addressed or their lawful agents.
18. Messages of distress or messages pertaining thereto.
19. Fifteen minutes.
20. Three times at intervals of two minutes.
21. One hundred miles day or night.
22. The coast station.

23. The signal "KA" the station called 3 times "DE" your call 3 times.
24. Must communicate with all vessels regardless of their nationality listen in every fifteen minutes; on 300 meters must listen in for 2 minutes.
25. Stop all work and listen to see if particular station is called for to prevent interference, copy all that is sent, report to captain.
26. Within 12 nautical miles use 1 KW and less use 1/2 KW.
27. The minimum necessary to transmit the required distance.
28. Use "KA" three times, then the station's call, followed by "DE" then your call 3 times.
29. Follow rule 28, give no. of message, no. of words, your sign, then "AR".
30. By adjusting the open and closed circuits.
31. Add inductance in the antenna inductance and bring the wave length the same as before. The most notable change in your set would be a decrease in the radiation of the set.
32. The "t" gives a greater capacity for the amount of wire used; its disadvantage is that it will sag in the middle. The "umbrella" can be used on a single mast; disadvantage is oscillations will die out quicker than other types. The "V" antenna has great oscillating capacity; disadvantage is limited space on ship prohibits its general use.
33. The starting box might be open, if so, short the open coil with the one next to it. The D.C. might be off, bearings might be tight, motor shunt field might be open; if so this would require a large amount of current to start it.
34. A circuit-breaker is composed of a solenoid with an iron core, adjustable springs, copper contacts, and ampere readings.

35. A short in the armature, an open in the field circuit, bearings might be tight.
36. Increase resistance in the motor field rheostat. To decrease speed, decrease resistance in the motor field rheostat.
37. To increase voltage decrease resistance in field rheostat; to decrease voltage increase resistance in the field rheostat.
38. Open generator field; loose connection in field; open or loose connection in generator field rheostat; speed to slow; poor brush contact on collector rings.
39. By adding generator field rheostat; add a choke coil; by varying the speed of the motor.
40. Raise the line voltage by removing resistance or increase supply source.
41. An excessive current would be required to start, causing a fuse to blow, burning out resistance, excessive speed, again motor would not function.
42. No voltage would be registered.
43. Place in a lathe and turn down or fit brushes to fit commutator.
44. By sparking at brushes and overheating.
45. An overload will cause heating.
46. Composed of two lead plates immersed in sulfuric acid and water.
47. 2.5 volts at full charge but will decrease to 2.1 when cooled.
48. The Edison cell consists of nickel hydrate; which forms the positive plate and iron oxide which forms the negative plate; these are immersed in a solution of caustic potash and pure water.
49. 1.2 volts.
50. Add pure water until liquid is one half inch above plate.
51. By means of the hydrometer; if reading too high add water; if too low add acid.

52. The normal rate of charge of a storage battery is that current which when maintained for some time fully charges it; also the temperature is taken as a guide.
53. A hydrometer is a glass tube ballasted at one end, having a graduated scale, usual reading as standard is 1.215.
54. Gassing of cells; bubbling; specific gravity will rise.
55. To prevent batteries discharging back into D.C. line, when said D.C. line is opened. To prevent reverse polarity in a D.C. source.
56. In lead cells if reading is 2 volts per cell.
57. The secondary of transformer; condensers; sparkgap; and primary of oscillation of transformer.
58. The aerial; aerial inductance; the secondary of the oscillation transformer and ground.
59. Direct and inductive couplings; disadvantages of direct coupling does not permit of fine tuning: advantage is very easily put up. Inductive coupling permits of fine tuning; prevents interference;disadvantage is a slight loss of energy.
60. Will throw wave out of resonance.
61. Adjust secondary of oscillation transformer.
62. By placing a small gap across secondary of transformer, one lead to ground and one to aerial.
63. A broad wave is issued.
64. Disconnect aerial circuit unusual noise at jar connections.
65. Disconnect aerial circuit; punctured jars; transformer burned out; current stopped.
66. Direct and inductive couplings.
67. Inductive couplings.
68. Adjust primary to increase loudness of in coming signal, then adjust secondary coupling for sharpness to cut interference, then adjust variable condenser to increase clearness.

69. By knobs varying for either log wave or short wave, also condenser.
70. A broad range is obtained thereby covering any amount of wave lengths that may be heard.
71. Placing variable in series with antenna and ground.
72. A point of resonance is obtained obliterating interference.
73. To add inductance and amplification of wave into detector and head telephones.
74. By use of a wave meter; by tuning for a sending station when its sending wave is known.
75. It is a variable resistance, connected in shunt with batteries to vary incoming signal.
76. Connect batteries and phones in series with the fixed condenser and if loud click is heard in the phones the condenser can be said to be shorted; but care must be taken to distinguish between the capacity click and the circuit click.
77. Place tops of cords on battery cell, and if loud click is heard phones are OK. If not heard test cord separately and is trouble in the magnet unwind and repair; one cord can be used in an emergency.
78. Use phones and battery and test each circuit with detector; also use a test buzzer for transmitter.
79. Detector is of high resistance, so is telephone, then again human ear is of high intensity.
80. Consists of fixed inductance; variable condenser, crystal detector, in and out switch; shunt coil; buzzer; and batteries and phones.
81. Hot wire ammeter and wave meter.
82. Consists of resistance wire; magnets; adjustable; has scale reading in amperes; showing output on transmitting.
83. By use of a wave meter; taking two readings a plus and minus and between these two readings will be given resonance.

84. The leyden jars; the compressed type of glass upon which asserted high air pressure.
85. In parallel; in series; and series-parallel.
86. Strain on each jar is lessened.
87. More jars are required to stand added strain of potential.
88. Excessive voltage, or too wide a space between spark-gaps.
89. Place safety gaps across secondary terminals.
90. Aerial, detector, ground and telephones, with phones across detector, other items in series.
91. High power can be used safely.
92. Rig antenna with smoke stack, properly insulated, etc.
93. Easily read through interference.
94. Number of wave-trains per second of transmission.
95. Number of spark-frequency bridging spark-gap per second.
97. A wave having only one hump during transmission and using 90% os its energy for transmission.
98. A primary and secondary coil wound around an iron core, both coils insulated from each other; a vibrator is used on some induction coils.
99. Use buzzer and battery for test on primary. Also use a lamp in series and if lamp lights primary is OK. For secondary use phones and battery across secondary leads, if a click is heard secondary is OK
100. Gaps too close; to remedy widen air space.
101. Quenched gap; rotary gap; synchronous and non-synchronous.
102. Used in antenna, to prevent incoming signals going to ground. Also acts as lightning switch in storms, preventing receiver being injured, seldom used nowadays.
103. Yes.
104. All joints or connections should be soldered.
105. The time taken for a natural period to complete itself.

106. Add inductance to the antenna circuit.
107. Placing a variable condenser in antenna in series with ground.
108. Connect phones and batteries in series with antenna and ground if loud click is heard the circuit is closed and aerial is grounded.
109. Caused by salt spray; by smoke deposit from smoke-stack.
110. Scrape parts and immerse with grease or other substance.
111. Decrease output of energy.
112. To increase capacity of radiation and receiving.
113. By radiation reading on hot wire ammeter. Use air core transformer place lamp inside of core, and if lighted radiation takes place. Also, if signal is heard by anyone listening in.
114. A three pole d.t.
115. Using an inductively coupled set first disconnect the aerial and ground from the secondary of the oscillation transformer and make the spark jump the gap and take the reading with the wavemeter adjusting the clips on the primary of the oscillation transformer until the desired wave length has been obtained. Next disconnect the leads from the oscillation transformer (primary) and connect the aerial circuit up and place a small gap in series with the aerial and ground this end. Excite with a battery then add inductance in the aerial inductance or adjust with clips on the primary of the oscillation transformer until the wave length has been obtained as you have in the closed circuit place a hot wire ammeter in series with the aerial and ground, add inductance to the aerial inductance until the hot wire ammeter reading is the highest, then take the wavemeter outside inductance in relation to the aerial if the signals can be heard at two points, resonance

will occur by varying the coupling of the secondary of the oscillation transformer until signals are heard at but one point of resonance. This will sometimes decrease the radiation slightly but where a wave of one hump is required this is necessary. (Both the reading of the open circuit and the last reading are taken outside, is inductive relation to the aerial). The first reading is usually taken with a glow lamp the other two readings are taken with the detector and telephones in use and glow lamp cut out.

116. When open and closed circuits are out of pure energy and pure wave.
117. To secure maximum transmission of energy and pure wave.
118. By varying capacity or inductance or inductance alone.
119. Increase of jars will increase wave length, and vice-versa.
120. Add turns on primary of oscillation transformer.
121. Any drawing will do.
122. Th' th' th' that's all folks.

# RESTORATIONHINTS

## Helpful tips from CHRS members

A quick way to replace capacitors and resistors in most sets can be accomplished in the following way: Cut out the old part by clipping the leads very close to the part itself. Take the leads on the new part and wind them around a piece of stiff wire, precision screwdriver, or test lead in the form of a tightly coiled spiral spring. The coil can then be slipped over the remaining portion of the original leads and easily soldered into place. This is much easier than struggling to unsolder the component form its original solder point, and often makes it easier to replace if it is located under other components and wires.

*Formby's Furniture Face Lift* kit can often rejuvenate the original finish on most sets if the finish has dulled but is still intact and not alligatored. The rejuvenated finish can either be glossy or satin as the user desires. This often saves the time and trouble of complete refinishing.

Another excellent product for restoring the original beauty and depth to a wood finish without refinishing is *Howard's Restor-A-Finish.* When applied and rubbed with 0000 steel wool, the product cleans, removes scratches, water marks, white rings, etc. Several colors are available, depending on the shade of wood that you're working with.

Ever wonder how restore the lustre to the airplane cloth used on many portable sets? A few coats of *Future* acrylic floor coating will make it shine again. First, clean the cloth with *Fantastik or Formula 409* to remove dirt. Then wipe on the *Future* with a cloth and let it dry. It will soak in and become glossier with each coat. This will work on many other surfaces, too. Be sure to try it on an inconspicuous spot first. Future may be removed easily with household detergent and ammonia. Thanks, George Murdock for this great tip!

# CLASSIFIED ADVERTISEMENTS

**FOR SALE:** I publish a monthly list of 100's of items for sale including radios, tvs, speakers and other related items such as advertising, books, and magazines. To receive send SASE with $.56 postage to Jim Clark, Dept. CHRS, Starboard, Okemos, MI 48664

**FOR SALE:** TUBES, thousands available, all types, N.O.S. and used tested good. Fair prices. Send SASE for list or send needs for a quote. Phone 9:00 AM-10:00 PM, PDT. Adam Schoolsky, N6OSJ, 39120 Argonaut Way #195, Fremont, CA 94538 (415) 791-0330.

**FOR SALE:** EXPERIMENTERS INFO. SERVICE Super-het Advanced Model C Receiver. Three RF, two audio, and two detector stages. Dimensions 40"x8"x7 3/4" 42 lbs. Call or Write: Bud Larson, 1325 Ridge Way, Medford, OR 97504 (503) 773-5214.

**FOR SALE:** THE FINEST HIGH GLOSS PLASTIC POLISH available anywhere. Easy to use, economical. Excellent on plastic, bakelite, catalin. Even clears yellowing on celluloid dial faces! WENOL metal polish for brass, copper, aluminum, nickel, stainless steel, tin cleans and polishes to a high lustre, easily. HOWARD'S wood care and restoration products also available. Call or write for a free brochure. The Critics Choice, 39120 Argonaut Way #195, Fremont, CA 94538 (415) 797-2733.

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## The Only Service Instrument That Will Make All These Tests

It has the only tube tester giving oscillation tests from raw A. C., or from radio sockets. Tests all tubes 1¼ to 15 volts, including screen grid and heater types. Reads direct output of rectifier tubes. Permits complete and comprehensive analyzing from radio socket of all type A. C. or D. C. radios with Master plunger selector system. Voltage readings with and without load. Gives independent cathode readings.

The modulated tube radiator takes place of broadcast stations for testing—is a driver for neutralizing and oscillator for synchronizing, giving meter dip and speaker click at resonance. Has heavy duty rejuvenator. Bridges open states of audio—alters outputs—tests


fixed condensers and contains stage of audio—fixed capacities—500,000 ohm variable resistance and 30-ohm rheostat.

Besides regular tests, all apparatus is accessible through pin jacks. Instrument lifts out of case.

## Absolute Accuracy Assured

Three Weston meters and SUPREME engineering, combined with the finest of materials and workmanship, insure absolute accuracy. A Voltmeter of three scales 0-10-100-600-1000 ohms per volt; a Milliammeter of 125 mils and 2½ amps; and an A. C. Voltmeter, three large scales of 0/3/15/150, are built into the SUPREME test panel and are housed in Bakelite cases.

All instruments are manufactured for 110 volts and 50-60 cycles. Instruments other frequencies can be furnished special at slight increase in price.

# World's Leading Radio Engineers Praise The Supreme Diagnometer

THE SUPREME Diagnometer is recognized as the outstanding service instrument in radio. In one gigantic forward stride this marvelous instrument changed the standards of radio service. It filled the long-felt need of radiotricians for a single, compact, portable instrument that would not only make all tests upon which they had previously been forced to rely, but would also provide those necessary tests and analyses which had previously been restricted to the most complete and expensively equipped radio laboratories.

### A Real Profit Maker

With the SUPREME Diagnometer the radiotrician is mechanically equipped to solve any radio problem that may come before him. He is prepared to handle intricate and technical tasks in a way that will earn the enthusiastic satisfaction of his patrons and enable him to command the highest fees.

Yet the SUPREME is amazingly simple to understand and operate. Its compact portable carrying case weighs only 25 pounds and measures 18 x 10½ x 7 inches. The case is ingenious and convenient in design, providing handy compartments for carrying all necessary tools, adapters, and accessories, including a swinging tube shelf which affords complete protection to extra tube.

SUPREME Service League members everywhere are securing greater increases in business and earnings. Those who sell radios report that the reputation they have gained for dependable and scientific service has increased their receiver sales as well as their service profits. Radio owners have learned and are telling each other that SUPREME Service is the most dependable and thorough to be had.

Order a SUPREME Diagnometer on our six-day trial plan. See for yourself what this amazing instrument will do for you.

### Send No Money

Thousands of owners attest to the superiority of the SUPREME. PROVE its value to you by using it six days in actual service work. We let you be the sole judge. Sign and fill in the six-day trial request and mail today.

### Prices and Terms

Under our time payment plan, the Model 400A SUPREME Diagnometer can be bought for $38.50 cash and 10 trade acceptances (installment notes) for $10.00 each, due monthly. Cash price, if preferred, $134.65. All prices net; no dealers' discounts.

### 6 Day Trial

Date.....

SUPREME INSTRUMENTS CORPORATION
341 Supreme Building
Greenwood, Miss.

Please ship me one Model 400A SUPREME Diagnometer.

Upon delivery of the instrument, I will deposit with the express agent either the cash price of $134.65 or $38.50 cash and 10 trade acceptances (instalment notes) for $10 each, due monthly, at my option, subject to the following conditions:

It is agreed that the deposit made with the express agent shall be retained by him for six days. If within that time, after testing the instrument I am not entirely satisfied, I have the privilege of returning the instrument to the express agent in good condition, with the seal unbroken (see note below) and adapters and parts intact. Upon such return and upon the prepayment of return express charges, the deposit I have made with the express agent will be promptly returned to me.

Signed.....

Firm name.....

Address.....

City..... State.....

Please send three or more trade references, including at least one bank, with this coupon.

NOTE—The seal on the panel of the instrument covers the master screw in the assembly. It is never necessary to disturb this, and it does not in any way prevent or restrict the use of the instrument. Factory guarantee ceases with disturbance of seal.

### Look for the Sign of Efficient Radio Service


Radio Owners: Look for this emblem in your radio shop or on the button worn or card carried by your service man. *It is your guarantee of dependable service.*

# SUPREME

## *Radio Diagnometer*

*conceivable*
*Makes every test on any Radio Set-*

RADIO BROADCAST. April, 1929. Published monthly. Vol. XIV, No. 6. Published at Garden City, N. Y. Subscription price $4.00 a year. Entered at the post office at Garden City, N. Y., as second class mail matter. Doubleday, Doran & Company, Inc., Garden City, N. Y.