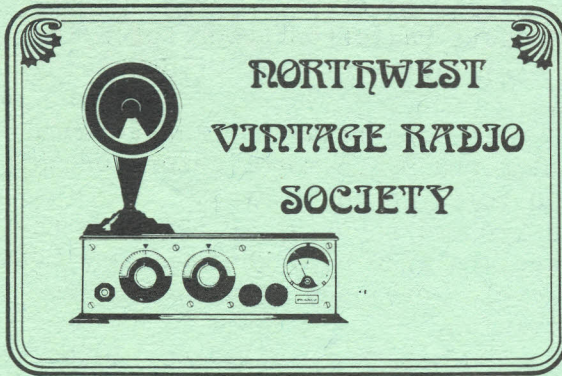


Vol. 4

No. 5



MAY

1978

# CALL LETTER

\*\*\*\*\*  
NORTHWEST VINTAGE RADIO SOCIETY MEETING MAY 13, 1978  
SPECIAL CRYSTAL SET DAY--BRING YOUR FAVORITE RADIO!  
\*\*\*\*\*

## PORTLAND LISTENS TO STATION 7XG

By: Art Redman

The first Portland station to broadcast on a regular schedule was 7XG; an amateur station owned by Willard P. Hawley, Jr. From his home at 400 N.E. 22nd Avenue, Hawley began broadcasting instrumental and vocal music from 8 to 8:45 PM on Tuesday and Wednesday, and from 9 to 9:30 Thursdays in the first week of March 1922.

The transmitter was designed and built by Charles Austin, the president of the Northwestern Radio Manufacturing Company. Hawley broadcasted on the 360 meter band. The initial cost of the station was \$6,000.

Cont. on page 2



The station consisted of:

Four 50 watt radiotron power tubes in a Colpitts oscillatory circuit with Heising Modulation.

A 9.75 volt Acme filament transformer.

A Robbins and Myers motor generator which provided 500 volts to the plates.

A Ward Leonard rheostat to regulate the plate voltage. A 1/20 h.p. Westinghouse motor with a 900 cycle note used as a chopper for code transmission.

Five Weston meters (oscillator plate current millimeter, oscillator grid current millimeter, radiation thermometer, modulator plate millimeter and plate volt meter).

Two Receivers:

The short wave receiver was designed by the Northwestern Radio Manufacturing Company. It had a plate variometer, grid variometer, a variocoupler and a primary inductance and capacitor. Tuning was from 160 to 450 meters. A fixed capacitor shunted in the secondary circuit decreased tuning down to 900 meters.

The long wave receiver was a Collin B. Kennedy which covered 600-20,000 meters.

For use with both receivers were three headphones; the Brandes navy model, Western Electric and the Baldwin mica diaphragm type. Both receivers were connected to a Northwestern two stage amplifier and a Magnavox speaker. The detector and amplifier filaments were lit by a

CONT. ON PG. 11

## CALL LETTER

The Call Letter is a monthly publication of the Northwest Vintage Radio Society which meets the second Saturday of each month at the Buena Vista Club House, Sixteenth and Jackson Streets, Oregon City, Oregon.

**Editor** ..... **Bob Hay**

**Staff** .. Tom James, Cathi Hay, Mark Moore

Address all correspondence regarding this publication to: The Call Letter,  
P.O. Box 02379, Portland, Or. 97202



# OUR PEOPLE

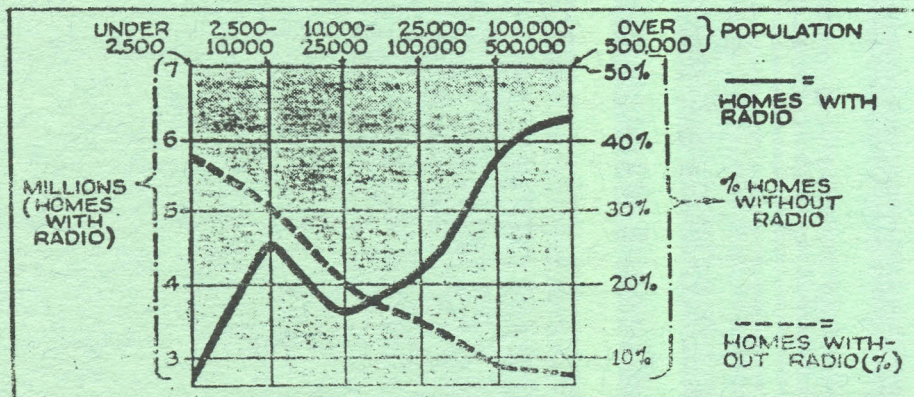
The May meeting will include as a special feature a video tape showing of the recent program on KOAP-TV dealing with radio collecting. Our own Tom James and Harley Perkins discussed various aspects of the hobby and the history of radio. Also included was the film footage taken during the November meeting. If you missed the television showing be sure to attend the May meeting.

All the necessary papers and information have been turned over to Craig Hoaglin's attorney, who is working on our incorporation.

Jim Mason and our club president, Tom James, recently attended an auction of some very fine radios in Kelso, Washington. Tom bought an early Zenith battery set (Model 27) and a 1924 Music Master Exponential Horn Speaker. Jim got several sets including an Atwater Kent Breadboard. All in all quite a haul . . .

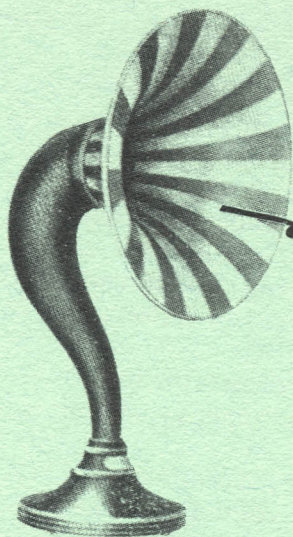
Next meeting will be Saturday, May 13, at 10:00 a.m. at the Buena Vista Clubhouse, 16th and Jackson Street in Oregon City.

## WHERE DO RADIO SETS SELL?



Joint Committee of Radio Research found that larger cities have greater percentage of radio ownership than do hamlets. Heavy line shows about 6 1/4 million sets in cities of over 500,000; only about 2 1/2 million in cities under 2,500. Dotted line shows 36% of smallest-town homes lack radio, while only 7 1/2% of homes in metropoli are radioless. You know where the market is. Go to it!





# ATMOSPHERICA

By J

## The Rhyme of the Roving Rogue

My name is Rollie Johner,  
I'm a man of merry moods ;  
I buy old pots and radios  
To lay on other dudes.  
I forage many miles a month ,  
Over freeways, roads and trails,  
Getting back in town, at times,  
To sell at market sales .

Some suppose I fudge a bit ---  
With the buyer getting stuck.  
A guy has to make a living,  
And turn that needed buck!  
What if someone takes offense  
At a deal a bit oblique---  
Time will heal those minor wounds,  
And a month will salve the pique.

Brrr! The atmosphere is chilling---  
And I'm getting short on fuel ;  
In a week I'll be in Mesa,  
Where the "Marks" are not so cruel.  
And if in Mesa, anyone,  
Should dare infer I'd slight 'em,  
I'll loose my brakes and mosey on----  
And so ad infinitum !



# POWER SUPPLY

## AUNT SAMMY'S RADIO RECIPE OF THE MONTH

### \*VEGETABLE VITAMIN SOUP\*

- |                        |                                  |
|------------------------|----------------------------------|
| 1 cup diced carrots    | 1 cup tomato juice               |
| 1 cup chopped onion    | 2 tablespoons chopped gr. pepper |
| 1½ cups chopped celery | 6 tablespoons butter             |
| 1 cup diced turnips    | 3 teaspoons salt                 |
| 2 cups diced potatoes  | ¼ teaspoon pepper                |
| 2 quarts meat stock    |                                  |

Brown all the vegetables, except potatoes, in the butter in a skillet for about 10 minutes. This helps develop the flavor. Then place the contents of the skillet in a saucepan. Wash out the particles of browned vegetables clinging to the skillet and add to the stock in the saucepan. Boil 20 minutes longer. The potatoes are added last, because they do not require much time to cook. If added with the other vegetables, they would be overcooked.

# Cunningham

## CX-301-A

READ CAREFULLY

READ CAREFULLY

Cunningham CX-301-A is a General Purpose Storage Battery tube for use either as a Detector or Amplifier. It is recommended for Radio Frequency stages and for the first Audio Frequency stage of amplification.

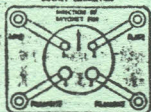
FILAMENT VOLTAGE	- - - - -	5.0 VOLTS
FILAMENT CURRENT	- - - - -	0.25 AMPERES
DETECTOR PLATE VOLTAGE	- - - - -	45 VOLTS
AMPLIFIER PLATE VOLTAGE	- 90 VOLTS for General Amplification	135 VOLTS Maximum
AMPLIFIER GRID VOLTAGE	- -4.5 VOLTS	-9 VOLTS

The filament in CX-301-A should be operated with as low voltage as possible consistent with satisfactory results. Low filament voltage increases the life of both tubes and batteries. THE FILAMENT VOLTAGE SHOULD NOT BE ALLOWED TO EXCEED THE RATED VALUE OF 5.0 VOLTS.

A plate voltage of 90 volts, used with a negative bias of 4.5 volts, is recommended for the first Audio stage. For the Radio Frequency stages the same values may be used, but lower ones often give better results.

For the last Audio stage, a Power Amplifier tube is recommended for best loudspeaker results. If, however, Cunningham CX-301-A is used, 135 volts may be applied to the plate and negative 9 volts to the grid, in order to avoid distortion. A VOLTAGE EXCEEDING THE MAXIMUM OF 135 VOLTS SHOULD NOT BE USED ON THE PLATE OF THIS TUBE.

SECRET CONNECTION



A TECHNICAL BULLETIN

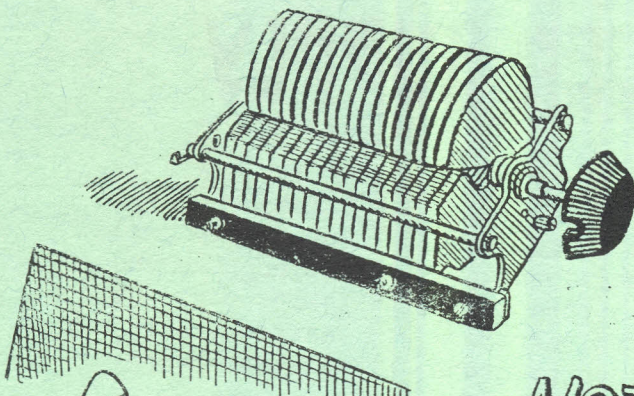
on this tube is available upon request.

Handle  
Tube  
Carefully

RC-32840 Rev. (1-29)

E. T. CUNNINGHAM, INC.



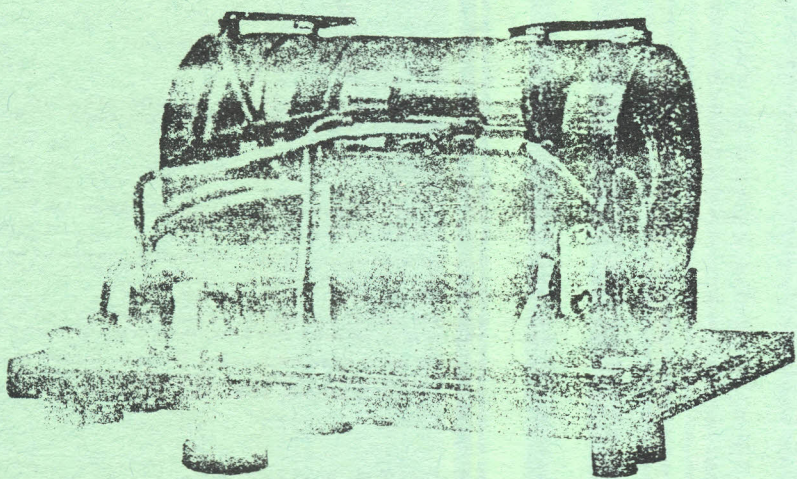


A CONDENSER DOES NOT CONDENSE!! IT MERELY STORES ELECTRICITY!! THE ACCEPTED NAME FOR IT IS A "CAPACITOR".....

## How to Make a Portable Receiver

By W. B. Hodgson

The circuit described herewith has one or two peculiarities which I am sure account for the remarkable records this set has employed in only two sets on the market today, one the Aeriola, Sr., the other the Colin B. Kennedy apparatus. This feature



The Portable Receiving Set. Simplicity in Design and Construction Has Not Been Overlooked.

made in long distance reception. The method of securing regeneration by means of both a tuned and tickler plate circuit is gives the strong oscillation produced by means of tickler feed back together with the very gradual control of regeneration



# HOW TO MAKE A PORTABLE RECEIVER

and oscillation common to any variometer tuned plate circuit. Another unique feature is the fixed antenna circuit condenser. As we all know, the usual single circuit receiver employs a fixed inductance or one variable in steps in series with a variable capacity to resonate the antenna circuit. It is every bit as efficient to have a fixed capacity and a continuously variable inductance, and this is the method employed.

Let us now proceed with the actual constructional details. As this set is operated with the controls in a horizontal position, as the British build their sets, and the great majority here prefer a vertical panel, a few changes will be made in order to adapt the instruments to panel mounting. The parts needed are as follows:

- 1 piece of bakelite tubing  $3\frac{1}{2}$ " in diameter by 6" long with a wall  $\frac{1}{16}$ " to  $\frac{1}{32}$ " in thickness.
- 2 pieces of bakelite tubing  $2\frac{3}{4}$ " diameter by  $1\frac{5}{8}$ " long.
- $\frac{1}{4}$  lb. of No. 24 D.C.C. magnet wire.
- 3 type 601 micadons having the following capacity: .0001, .00025 and .002 microfarads respectively.
- 1 type 600 Dubilier condenser, capacity .00025 MF.
- 1 meekohn Radio Corp. grid leak.
- 1 socket for the WD-11 or UV-199 tube (there are several good ones on the market and either the Atwater Kent, NaAid, General Radio or R. C. A. will do nicely).
- 1 rheostat.

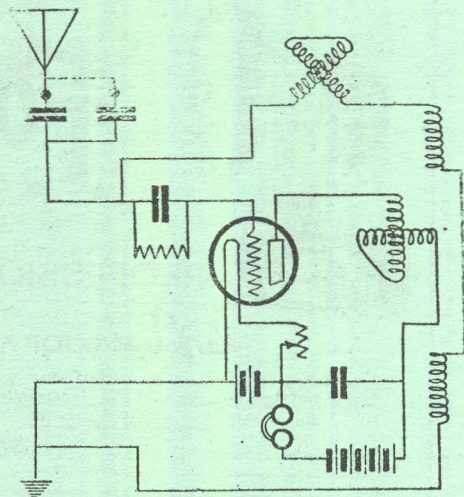
A vernier is hardly necessary and is not recommended, as this tube is not critical.

This completes all parts necessary except panel binding posts, spaghetti and dials. Complete parts without tube should not cost over eight dollars.

Draw a line down one side of the 6" tube parallel with the center line and on this line measure in  $1\frac{7}{16}$ " from each end and drill a  $\frac{5}{16}$ " or  $\frac{3}{8}$ " hole. Directly opposite these holes in the opposite wall of the tube drill a  $\frac{3}{16}$ " hole. The larger hole is on the side of the tube next to the panel and is large enough to allow the shaft and an insulated flexible lead to pass through together without binding. At both ends of a line drawn through the centers of the  $\frac{3}{16}$ " holes drill a small hole, the proper size for a small machine screw. Put these two screws through the holes from the inside and hold them in place with a nut. We are now ready to start winding.

Hold the tube horizontally in the hands and fasten the end of the No. 24 wire under the screw at the left hand end and wind so that the winding progresses toward the right. Furthermore, the direction of rotation of the winding should be such that the spool of wire is passed away from you as the wire passes under the tube and comes toward you as the wire is brought over the

top. This small detail is important in order that the inductance of the tickler winding may assist and not oppose the plate variometer. When the wire is fastened under the screw head it is brought straight in for about  $\frac{1}{2}$ " before the winding is started.



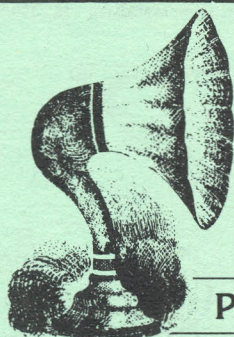
The Circuit of the Westinghouse Aeriola, Sr. Which is Employed in the Above Receiver Because of Its Operating Efficiency. All of the Stationary Coils Are Wound on the Same Form.

Just 16 turns are put on and then a space of  $\frac{3}{4}$ " is left and the winding again continued for another 16 turns. The width of these two windings is about  $\frac{3}{8}$ " each and they constitute the stator of the tuning variometer. The wire may be stiffened and held securely in place as it is wound, by painting it with liquid bakelite. If this cannot be obtained water glass will do, but is not quite as efficient. The winding is now continued after a space of  $1\frac{3}{8}$ " is left and six turns wound on. At the end of these six turns a very small hole is drilled in the tube and after about 6' of wire is unreeled from the spool it is broken and the end passed down through the hole and pulled through until all slack is taken up. Just 2" further along on the tube and about  $\frac{5}{8}$ " from the right hand end of the tube, a similar hole is drilled and the wire passed back through the tube and six more turns put on.

## The Winding

Two small holes about  $\frac{3}{4}$ " apart are drilled close up at the end of this winding and the wire threaded through once or twice to keep it from unwinding. A lead about 6" long should be left and this is later soldered to the shield behind the panel. In the 2" empty space between the two coils of six turns each is wound the stator of the plate variometer exactly similar in every





# For Sale

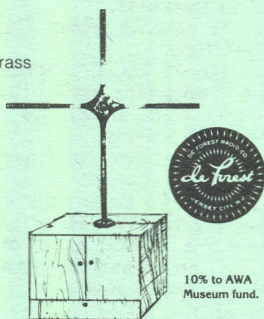
TRADE RADIOS, ETC.  
BY G. STREETER  
1922

## PROFESSIONAL REPRODUCTIONS

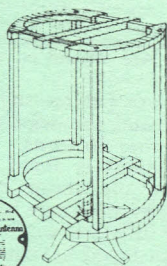
### DeForest LOOP ANTENNA

Beautifully prefinished and assembled with over 100 machined brass fittings and Bakelite parts, with a DeForest decal. Fits all D-7, 7A, 10, 12, and 17 sets. "DeForest wire included."

\$67.50 postpaid



10% to AWA Museum fund.



### RADIOLA LOOP ANTENNA AG-814

Precut Mahogany frame with an etched brass name plate and 1924 instruction card. This loop is a great addition to any collection and fun to assemble. Includes radiola type wire.

\$43.50 postpaid

10% to AWA Museum fund.



#### Radiola Grand Speaker Grills

Unfinished Mahogany is precision cut to the 1922 pattern. Needs only staining to complete your rare and unusual radio.

**PRICE \$15.50**  
postpaid

#### Radiola Antenna Wire

Multi-strand copper wire with a brown braided Celulon cover just like the original 500' roll —

**PRICE \$35.00**  
postpaid  
Smaller Lengths — 9¢ ft.

#### Radiola V & VI Wooden Tops

Always missing, this solid Maple reproduction is the crowning compliment to another uncommon set. Unfinished.

**PRICE \$19.50**  
postpaid

"NEW"

#### DeForest Type Green Wrapped Litz Wire Avail.

100' Roll

**PRICE \$10.00**  
postpaid

SATISFACTION GUARANTEED ON ALL ITEMS OR RETURNED FOR FULL REFUND.

**GLENN S. STREETER**

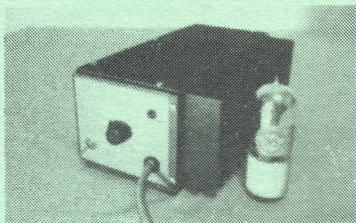
4133 VIA NIVEL, PALOS VERDES ESTATES, CA 90274 • (213) 375-5522





For Sale

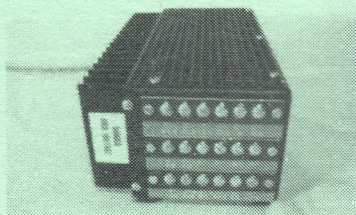
## H-10 POWER SUPPLY



Now! For the first time a premium quality power supply. The H-10 power supply is made of specially designed and the highest quality components (not surplus or used parts).

And it's not being assembled in someone's garage. The H-10 has been contracted by a top-rate manufacturer who builds power supplies primarily for the laser industry. Thus it is fully warranted for a full year.

And no other power supply offers as many regulated outputs.



The Model H-10 is a premium quality regulated power supply designed to power over 99% of all battery radios. The Model H-10 was developed primarily for the radio collector but is capable of operating virtually all battery sets manufactured between 1920 and the end of the vacuum tube era around 1960.

The Model H-10 contains three independent, electrically isolated, regulated power supplies. The "A" supply provides 12 switched outputs between 1.1 and 9V. The "B" supply can deliver up to 6 *simultaneous* regulated outputs. The "C" supply can deliver up to 8 *simultaneous* outputs. All outputs feature electronic short circuit protection.

### TYPICAL SPECIFICATIONS

<b>Input</b>	117V AC, 50-60Hz, 80W maximum
<b>Volts</b>	1 1.1 1.5 2.0 2.5 3.3 3.3 4.5 5 6 7.5 8 9
<b>"A" Output</b>	Single output switch selected, short circuit protected, ripple less than five millivolts RMS @ 5V and 5A, regulation 0 to full load 0.2% @ 5V, voltage tolerance 5%, overload protection Using the 1.1V, 3.3V and 5.0V output, allow operation of appropriate tubes with no danger of burn-out from improper filament rheostat adjustment.
<b>"B" Output</b>	22.5V, 45V, 67.5V, 90V, 135V and 180V may be used in any combination with a maximum total output of 50mA. Ripple is less than five millivolts RMS @ 22.5V and 50mA to less than 25mV RMS @ 180V and 50mA, voltage tolerance 5%, voltage regulation 0-50mA 2.5%, fold-back current limiting.
<b>"C" Output</b>	1.5, 3.0, 4.5, 9, 10.5, 13.5, 16.5 and 22.5V, 50mA @ 22.5V, ripple less than five millivolts, voltage tolerance 5%, regulation 0.1% at 22.5V. All other voltage obtained by a 25mA resistive voltage divider. Overload protected.
<b>Controls</b>	Power switch, A voltage selector switch, LED pilot light
<b>Line Cord</b>	Three wire, 6 ft., heavy duty
<b>Size</b>	3" H x 5" W x 9" L (includes controls)
<b>Weight</b>	5 lbs., 14 oz.
<b>Limited Warranty</b>	Warranty is limited to repair or replace, at our option, of any defect in materials or workmanship for a period of one year. Warranty does not cover shipping costs.
<b>Ordering Information</b>	Include check or money order for \$149.95 to Glenn S. Streever, 4133 Via Nieve, Palos Verdes Estates, CA 90274. We will pay shipping by UPS.



# LETTERS

Hi,

I let my subscription run out with the Feb. issue and I don't remember how much the dues are now. I am inclosing a SASE and if you will tell me the amount for membership fee I will send check for same.

I have been collecting for about 18 years and while I don't have a real large collection I do have enough "stuff" around the place that I stumble over it everytime I try to walk through. While I collect anything and everything pretaining to 'old radio' at the moment am concentrating on early radio test equip. and am really scratching to find a Supreme AAA-1 Radio Diagonmeter. I truly appreciate the work NVRS is doing and wish you fellas ( & girls) lots of luck.

Sincerely,  
Don F. Thompson

If these words mean anything to you, please give us a clue!

LES AIMS DU MUSEE DE L'ELECTRO-ACOUSTIQUE

BULLETIN de LIAISON

These are the words on the cover of a 14 page booklet that arrived in this month's mail. To give you as much of a hint as we have, the return address is:

Jacques Baume  
25, Avenue Nicolas II  
78600 MAISONS-LAFFITTE  
Les Yvelines - France

## NWVRS MEMBERSHIP DUES

Regular Members..... \$10.00

Associate Members..... \$ 7.50

( Dues are payable annually the first of each calendar year )



100 amp hour 6 volt Exide storage battery while two 43 volt Eveready B batteries provided plate potential. The field coil of the speaker was energized by an 8 volt, 80 amp exide storage battery to the Magnavox amplifier described below.

The power amplifier was a three stage Magnavox having 5 watt Cunningham transmitting tubes each stage having two tubes in parallel. The plate voltage was furnished by three banks of Eveready dry batteries of 108 volts each, each connected in series.

All the storage batteries could be charged by a 75 volt 6 amp General Electric Tungar rectifier.

The aerial was of the "T" type consisting of four forty foot long wires equally spaced by 10 foot spruce spreaders. A counterpoise extended 15 feet beyond the aerial at both ends.

The ground system consisted of four 60 foot strips of 3 inch copper ribbon buried at a depth of eight inches.

Station music came from either an electric driven Victrola with a Magnavox tone arm or a Steinway grand piano with a specially constructed spruce tone chamber. Two Magnavox microphones were also part of the studio.

**The** second regularly scheduled radio station in Portland was 7XF owned by the Northwestern Radio Manufacturing Company which announced its schedule several days later than Hawley. 7XF broadcasted public health information on Tuesdays and Fridays at 8:45 P.M.

KGW was the first commercial station in Portland with a regular programing schedule when it went on the air on March 22, 1922.

If one wants to split hairs, the first commercial radio station in Portland was owned by the United Wireless Company. This station, which was located on Council Crest, began broadcasting with no set schedule in 1908.

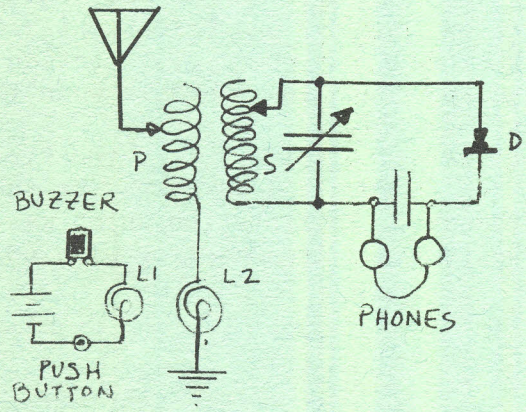


## REMEMBER WHEN?

Adjustment of the sensitivity of early crystal detector receivers was the key to successful reception. This usually involved moving the cat whisker to the most sensitive spot on the piece of crystal material (typically galena). Many early crystal sets used an auxiliary circuit consisting of a battery, a buzzer, and a momentary switch in series. Oscillations from the buzzer circuit when energized were inductively coupled into the receiver antenna-ground circuit. (see figure) Oscillations in the primary side of the antenna circuit were then inductively coupled to the secondary circuit. When rectified by the crystal detector an audio tone was thus produced in the headphones.

By simultaneously pressing the buzzer switch, adjusting the crystal detector and listening in the headphones for the loudest tone the detector could be adjusted for greatest sensitivity.

## THE EARLY CRYSTAL RECEIVER





# EDITORIAL COMMENT

Starting this month, and periodically in the future, we will be featuring an experimenter's construction project. Many members should be able to find the required parts in their parts boxes or in a good friend's parts boxes. Hopefully, these ideas will get everyone started on their own toward an entry in the NWVRS "vintage" radio contest.

Rather than argue about what a "vintage" radio is; whether it's a new radio made out of old parts, an old one rebuilt, or an old one in mint condition, let's get in there and channel that enthusiasm wherever "your" interest lies. The NWVRS contest should have room to recognize a good radio regardless of its era of vintage.

Anyone having some interesting "old radio" construction plans is requested to send us a copy for use in future CALL LETTERS. See everyone at the next meeting, May 13th.

Crystal radio sets have been a favorite for more than fifty years. While some of the other circuit configurations have come and gone the simple crystal set has stayed right with us. Our next club meeting will feature crystal sets. Everyone is encouraged to bring their most interesting crystal set or, better yet, bring a bunch of them. Let's see just how many different crystal radios have been made over the years.

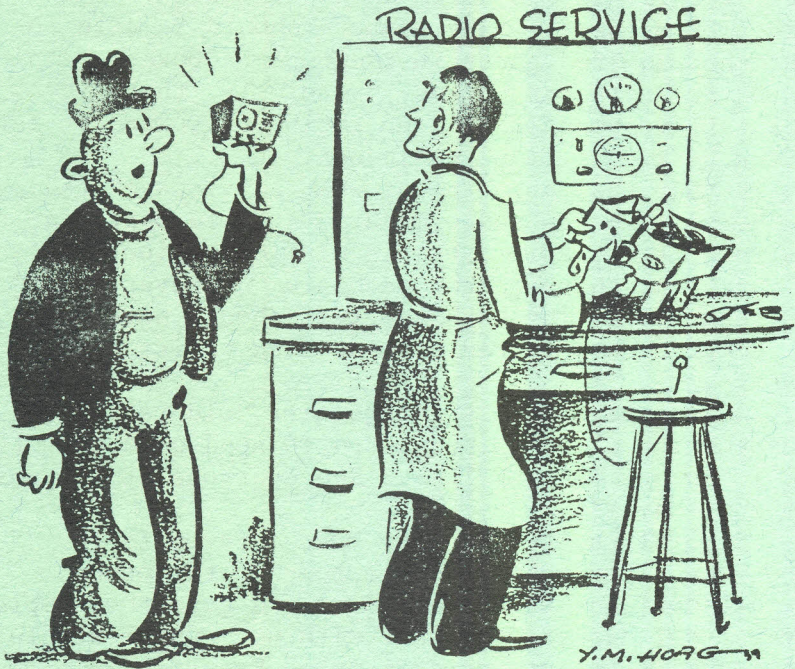
Bob Hay

\*\* \*\* \*

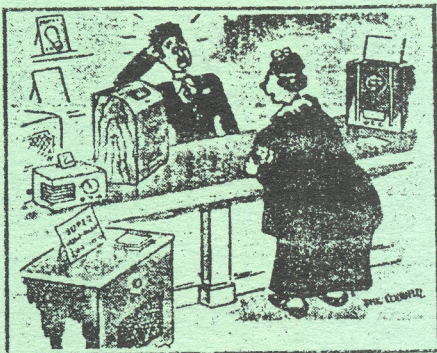
*An old Phono-Dog chanced to meet  
Vintage Radio Cats on the street;  
The fight that ensued  
forced one to conclude:  
It ain't safe to go anywhere now-a-days!*



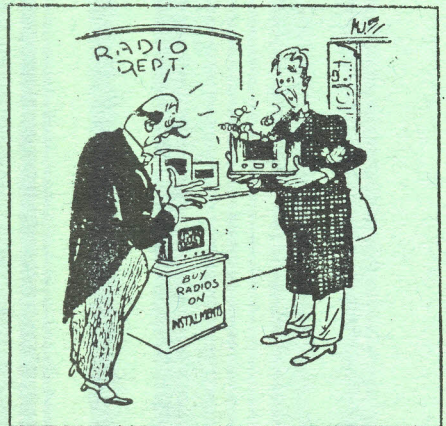
# CARTOON CLIPPINGS



What's the matter—don't any of you fellows want work?  
I'm willing to spend any amount up to 35c to get it fixed!!



"Have you got a good high-fidelity phonoradio with built-in television for about \$12.00 on an easy payment plan?"



"This guy said he'd paid half—so we compromised!!"



# RADIO STATIC

## RADIO WITTIQUIZ

1. An ELECTROLYTE is--
  - (a) Another name for an electric light.
  - (b) A field about an electromagnet.
  - (c) A solution in a storage battery.
2. An ARMATURE is--
  - (a) A person who sings on Major Bowes' radio hour.
  - (b) The rotating part of a motor.
  - (c) Part of an armchair.
3. You will find a PLATE in--
  - (a) The dish closet.
  - (b) A vacuum tube.
  - (c) A dynamo.
  - (d) A flashlight.
4. A DIELECTRIC is--
  - (a) A 2-way, radio-controlled electric railway going between Boston and New York.
  - (b) A non-conducting material.
  - (c) A Collision between 2 ohms in an electrical circuit.
  - (d) A new type of variable resistor.
5. A FIXED RESISTOR is--
  - (a) One that has been repaired.
  - (b) One that cannot be moved from its original position.
  - (c) One that has constant ohms-resistance value.

(Source: RADIO-CRAFT October 1938)

### SOLUTION TO LAST MONTH'S MATCH-UP

CROSLY	—	"SKY BUDDY"
A.C. DAYTON	—	"CORSAIR"
HALLICRAFTERS	—	"NAVAGATOR"
CLINTON	—	"LULLABY"
WARWICK	—	"DINAH"
MITCHELL	—	"CUB"



# SWAP SHOP

## WANTED

Bell for a horn speaker having a four inch neck.

Art Redman 503-774-9913

## FOR SALE

Send SASE for a list of radios; Marconi, Mignon, DeForest, etc. (Includes DeForest wire sample) to:

Glen S. Streeter  
4133 Via Nivel  
Palos Verdes Estates  
California 90274

## RADIO NEWS AMATEURS' HANDBOOK.

respect to the stator of the antenna circuit variometer. Be careful to keep to the same direction of rotation as before. The start of this winding is made at the back of the tube so that connection may be made to the rotor by means of a pigtail to the end of the metal shaft of the rotor. The other end of the stator winding is fastened in place with a piece of oiled cambric covered with the varnish and held under the windings. A 6" lead is left at this end, a piece of spaghetti is slipped over this and connection is later made to the plate connection on the socket.

The two rotors are next taken in hand and wound exactly alike. Commencing about 1/16" from the edge 20 turns are put on. A 3/4" space is left, and another 20 turns wound on, and the end fastened by threading through two small holes, as described before.

A 6" piece of flexible insulated conductor as small as can be had is soldered to the end of the winding on the inside of the rotor and passed out through a small hole drilled about 3/4" away from the hole for the front shaft. After the rotors are set in position inside the tube, this lead is brought out through the shaft hole in the stator which was drilled 3/16" or 3/8" for this purpose. This lead goes to one of the phone binding posts on the panel after the parts are all assembled. This, of course, applies only to the rotor of the plate variometer. The lead from the other rotor is brought out to one side of the antenna series condenser. The other ends of the rotor windings are soldered to the rear shafts which are made of

3/16" brass rod fastened securely into the rotors by means of small brackets on the inside. After the rotors are slipped into place a pigtail is soldered onto the end of these shafts and fastened under the screw heads which were placed in the large tube at the start. There should now be a total of four leads coming from the assembled unit as follows:

1. A flexible lead coming through the front shaft hole in the antenna circuit variometer which, as may be seen from the winding diagram, goes to the condenser.
2. A flexible lead through the shaft hole of the plate variometer which goes to one of the phone binding posts.
3. A lead from the end of the tickler winding. This is soldered to the shield after the tube has been fastened to the panel by a bracket at either end.
4. And lastly a lead from the stator of the plate variometer which goes to the plate of the tube.

This practically completes all constructional work and the set can now be assembled.

The tube is mounted vertically behind the left hand side of the panel with the antenna variometer at the top. To the right of the tube at the bottom on a line with the plate variometer is placed the rheostat. Above the rheostat is the tube socket. The wiring of the set is a simple matter and should preferably be of the busbar type. By consulting the wiring diagram any details which have not been made quite clear should be easily seen.