

The  
**Call Letter**  
of the Northwest Vintage Radio Society

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Vol 22

June 1996

No.6

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NOTICE: October Show to be held on the  
First Saturday of October

June 8th Meeting to Feature  
West Coast Radios -bring one



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In print since 1974

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# Northwest Vintage Radio Society

The Northwest Vintage Radio Society is a non-profit historical society incorporated in the State of Oregon. Since 1974 the Society has been dedicated to the preservation and enjoyment of "vintage radio" and wireless equipment.

Membership in the Society is open to all who are actively interested in historic preservation. The dues are \$15.00 for domestic membership, due on January 1st of each year (prorated quarterly).

The Call Letter has been a monthly publication since 1974. It was originated with the first president and continues to be a publication that both informs members of the society's business and that supports the hobby of collecting, preserving, and restoring vintage radios.

Society meetings are held monthly (except July and August) at the Northwest Vintage Radio Museum, 7675 SW Capitol Highway (at 32nd street) in Portland Oregon. They convene at or about 10 AM for the purpose of displaying radios, conducting Society business, and information exchange. Guests are welcome at all Society meetings and functions (except board meetings)

Other Society functions include guest speakers, auctions, radio shows and radio sales which are advertised in the Call Letter and are held in and around SW Portland.

## Society Officers:

President	Greg Bonn	(503) 642-5097
Vice President	Speed Feldschau	(503) 390-3928
Treasurer	Ed Charman	(503) 654-7387
Secretary	Ken Seymour	(503) 642-9115
Board member at large	Ed Pittaway	(503) 645-2883
Call Letter Editor	Dick Karman	(503) 281-6585
Museum Curator	Frank Rasada	(503) 246-3400

The Society's address is:  
The Northwest Vintage Radio Society  
Post Office Box 82379  
Portland, Oregon 97282-0379

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# June 1996

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### The CALL LETTER

Editor, Dick Karman, (503) 281-6585

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Note: CALL LETTER material  
should be sent to the Post Office Box !

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Call Letter Deadline  
20th of the month  
prior to publication.

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We want your input for the  
Swap Shop Pages, and  
technical help  
Plan to help out today !

The Call Letter is the official publication of the Northwest Vintage Radio Society. Circulation is limited to the membership and guests of the Society. The Society is not responsible for the material contributed for publication, nor the quality, timeliness or accuracy of the items offered for sale in the SWAP SHOP. By common agreement of the board of directors, the buyer assumes all responsibility for the satisfaction of any transaction.

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# Radio Show Report

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The Vintage Radio Show and Sale held May 4th was, by all reports, our most successful one in recent memory. Myron White who handled the table assignments and did the organizing should get some credit, but according to his own report the story that ran in *the Oregonian* gets the Kudos.

Credit for the Oregonian spread goes at least in part to Dick Dielschneider for "stocking the story" with radios, and giving out the information. Your editor never before had seen a full page, full color display in the local paper that subtly yet quite definitively pointed directly to our May event. Myron reports that "after the story came out, we didn't spend any more money on advertising."

Although gross receipts for the table rentals weren't any higher than normal (in fact, a few tables when vacant), the lack of expensive advertising and the heavy influx of first time folks, help the NW Vintage Radio Society make a healthy profit (first time for everything).

President Greg Bonn reports he had a great time just helping out people who saw the story in the paper and wanted to know what their vintage radio was worth. Using Bunis and other references, Gregg says that he must have answered nearly four dozen requests for appraisals.

Treasurer Ed Charman tells us we picked up more than a dozen new (or renew) members. The financial picture was made brighter by both dues and refreshment sales.

Several other members told stories of great "finds" and great sales. Overall the event benefited each member who could attend, and all members who gain from having a healthy and growing membership.

Thanks to all who made the sale work, and who enjoyed the day.

NORTHWEST VINTAGE RADIO SOCIETY  
 FINANCIAL STATEMENT  
 MAY 29, 1996

BALANCE, JANUARY 1, 1996 ... \$1,241.52

INCOME:

Dues .....	\$1,978.50
Auction Proceeds .....	169.00
Coffee Bar Proceeds ...	100.83
Swap Meet Table Rent 5/4	585.00

Income Total ..... \$2,833.33

EXPENSES:

Liability Insurance ... \$	172.00
P.O. Box Rent .....	40.00
<u>Call Letter</u> , incl Postage	724.73
Brochure & Swap Flyers	143.05
MAC rent for two swaps	636.00
MAC admin. fee .....	25.00
MAC Non-Rf Deposit (2)	30.00
Misc Postage .....	32.00
Incorporation Renewal	10.00
Coffee Bar supplies ..	33.74
Non-Skid Floor Mats (Swap)	31.98

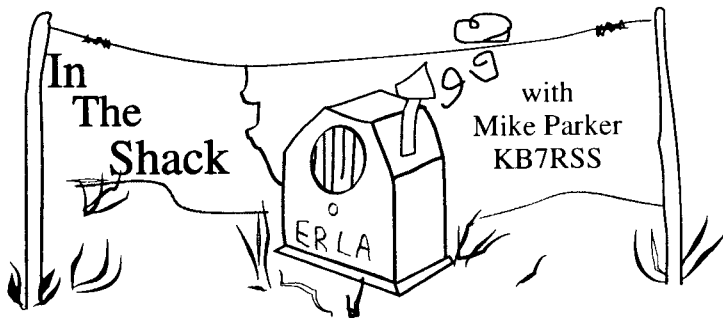
Expenses Total .....\$1,878.50

BALANCE, MAY 29, 1996 .....\$2,196.35

MEMBERS IN GOOD STANDING ..... 147

Respectfully submitted,  
 Charles E. (Ed) Charman, Treasurer

*Charles E. Charman*



## Run your Radiola 20 on 01A Tubes

Ahhhhh . . . The Radiola 20! What a massive hunk of battery operated table radio! The lowest priced new set in the prestigious line of 1925 RCA radios that featured thumb wheel tuning dials on a slanted front panel. The Radiola 20 displaces a full 16 by 19 inches of table space, yet still no real room in the cabinet for the batteries.

A 5-tube tuned radio frequency set, with an additional feature of variable regeneration in the detector stage, the Radiola 20 exists in the shadow of the famous RCA super-hetrodynes, such as the Radiola 25, 26 and 28, all introduced at the same time.

Perhaps they were truly the *Magic Home Music Box* that RCA's David Sarnoff had envisioned some years earlier. The new Uni-control tuning dials, with ornate escutcheons, certainly set a new trend in radio style. After all this was the Radio Corporation of America — the flagship of the fleet!

The suggested price was however, somewhat of a show stopper. The Radiola 20, with tubes, could be owned for just \$115; \$133 with a UZ-1325 horn speaker; or a whopping \$390 with an AC powered RCA 104 speaker! That was quite a tidy sum in 1925 dollars. Is it any wonder that folks bought \$60 Freshman 3-dial TRF's by the thousands? Or even built their own?

The Radiola 20 used dry batteries for power, and plenty of them! According to the diagram supplied with the radio, one must have a total of ten batteries. Six 1.5 volt dry cells connected in series parallel comprise the **A** or filament circuit. It will run on three dry cells, although six are recommended for more reserve current. Three 45 volt **B** batteries

are required to provide a 135 volt plate voltage, with taps for 90 and 45 volts. One C battery at minus 22.5 volts with a tap for 4.5 volts, is required if the UX-120 final amplifier power tube is to be used.

Imagine all of the space near the receiver just used for batteries alone. A battery cabinet would have been the most practical, but many people just set the batteries on the floor under the radio table, with a mess of wires connected up. It's no different today, with exposed computer cables tolerated, or even enjoyed.

The Radiola 20 incorporated the new UX based four pin dry cell tubes. Four UX-199 Radiotrons with the UX-120 power Radiotron were required. These tubes consumed very little current and were relatively cheap to replace.

So far, so good, low current dry cell tubes, the set powered by dry batteries, thereby no acid spills or recharging heavy storage batteries. A superior TRF regenerative circuit was used to bring in those distant stations, a stylish, trend-setting front panel on a rich wood veneer cabinet made the Radiola 20 easy to look at in any modern home for the twenties.

So what's wrong? . . . Well, I set my Radiola 20 up *In the Shack* and prepared to hook it up, ready to play. I didn't have 10 batteries for power, but I had battery eliminators. One supplied 45 to 135 volts, so it served as the **B** supply. I had an **A** power supply rated at 5 volts. . . . Wait a minute: 5 volts?

The UX-199/UX-120 tubes required 4.5 volts, maximum. I know it is only half a volt less, but those '99's glow very bright on 5 volts! Besides, I didn't have four good UX-199's or, the even more elusive UX-120. These tubes are scarce and expensive, now, more than 70 years later.

I did have the right number of UX-201-A tubes to make it run, and with a 5 volt supply. So, with no instructions from RCA advising to the contrary, I did the logical thing: I ran my Radiola 20 on '01A's.

Well . . . It worked! The stations tuned in with ample volume and a characteristic regenerative squeal came out when fine tuning with the right thumb wheel dial. The re-

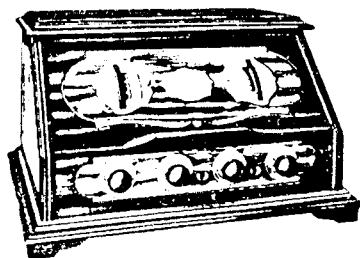
generative tuning section uses a novel proximity coil arrangement which actually moves the oscillator coil toward or away from the stationary coil. Two vernier controls on the lower front panel provide even better fine tuning of the Radiola 20. The filament rheostat didn't seem to mind the 5 volt power at all. They functioned well and no heat or smoke was caused by the larger current demand of the 5 volt tubes.

I began to close the lid . . . pleased with my new discovery when . . . . Oops! The lid would not close. I found, in order to close the lid, one must use 201-A tubes that measure no more than 3.68 inches. In my case these were Cunningham and Sonatron brands.

You have to look hard for five 201-A's that fit the *short* description. The short pin 01A's from previous years had a short glass envelope in some cases, but since the Radiola 20 does not use bayonet base sockets, the short pin tubes do not stay in the sockets very well. Another alternatives would be to use five type 30 triodes with a 2 volt filament supply, but I didn't try this.

Yes, I'll admit the whole endeavor was rather trivial but, one of the goals of this writer is to bring the obscure to your attention. The Radiola 20 is a good quality set and fun to play with. I will consider other oddities in the future.

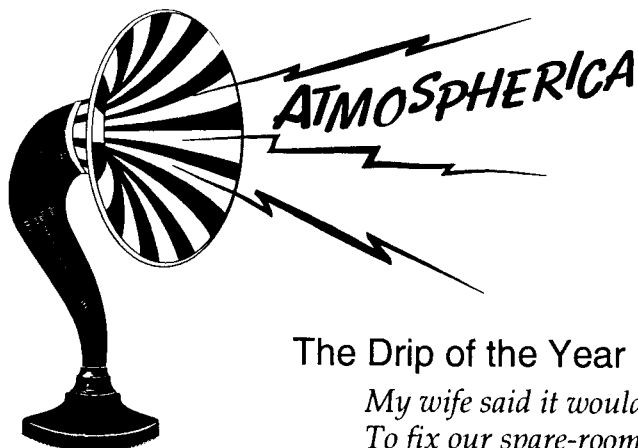
See you next time  
*In the Shack.*



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## RCA ~ Radiola 20





## The Drip of the Year

*My wife said it would be well  
To fix our spare-room roof:  
The weathers fair, the spot is marked,  
There'll be no chance of goof.*

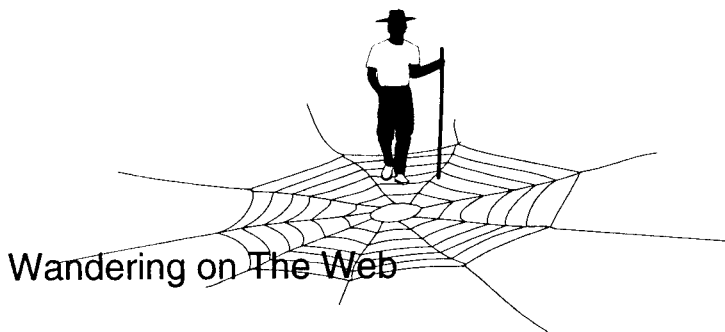
*Well, I had through June, a month  
To see those pesky shingles laid  
But just a week, or less to go,  
To get my Vintage set displayed!*

*As a beaver mends his broken dam,  
I slaved all that final week  
To rebuild, restore and polish up  
My Clarion, my classic antique.*

*Then I went fishing a week or so  
To ease my nerves and tension:  
I went far a-field in finny quest,  
The Camper is a great invention.*

*When I returned, would you believe,  
The sight that met my gaze?  
My beautiful Clarion wet as a sponge,  
'Neath that leaky roof for days!!*

*I haven't told the efficient wife  
Of the tragedy out ur way.  
After all . . . How would you start?  
And what the Heck could you say ??*



By Dick Karman

There is an ever-increasing number of Web Sites dealing with Vintage Radio. Some have very familiar names:

**<http://home.navisoft.com/horn/vrps.htm#>**

This is the Vintage Radio and Phonograph Society (VRPS) and Antique Wireless Association (AWA) Chapter in Dallas and Fort Worth who just had their 20th annual convention. Their *Horn Speaker* has been in print as long as our *CALL LETTER*

**<http://www.lookup.com/Homepages/77848/home.htm>**

This is the California Historical Radio Society, chartered in the State of California; formed in 1974 and still going strong. That URL is a mouthful!



**<http://cpu.net/classicradio/>**

This is the Classic Radio's Cyberspace Museum of Merrill Mabbs,

E-mail: [mmabbs@cpu.net](mailto:mmabbs@cpu.net)

Loads of pictures of his collection like this speaker:



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# Neutralizing RF Amps

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## The Handling of Neutrodynes and the History of Neutralizing RF Amplifiers

by John Alford, W5TXL

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Before the pentode there was the tetrode. Before that there was trouble...at least for the radio engineer of the 1920's who was attempting to develop effective radio frequency amplifier circuits using the available triode tubes of that time. The problem, of course, was the grid to plate capacitance which was 8 picofarads for a typical triode like the type 01-A. While this type of capacitance was negligible at audio frequencies, it created a real problem in designing stable RF amplifiers for the 200 to 600 meter wavelengths. Figure 1 shows a typical triode RF stage with the grid meter wavelengths. Figure 1 shows a typical triode RF stage with the grid to plate capacitance,  $C_{gp}$ , emphasized externally with [Triode R-F Stage] dotted lines. Because both the grid and plate circuits are tuned or else coupled to tuned circuits, the circuit contains the necessary elements for oscillation with  $C_{gp}$  providing the feedback path from grid to plate. This circuit will always oscillate if enough energy can be fed back from the plate to the grid in the correct phase to overcome circuit losses. Unfortunately, the conditions for best gain and selectivity are also those which promote oscillation. In order to prevent oscillation in RF amplifiers it was necessary to reduce the stage gain to a level that insured circuit stability. This could be accomplished in several ways such as lowering the Q of tune circuits; stagger tuning,

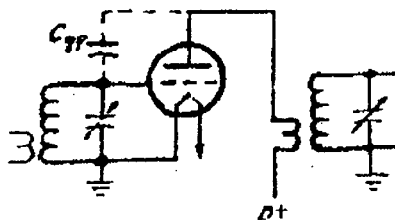


Figure 1. Triode R-F Stage

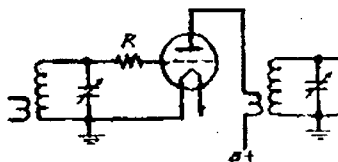


Figure 2. R-F Stage with Lossy Resistor

reducing filament voltage on the amplifier tube, loose coupling between stages or inserting a "looser element into the circuit. While all these methods reduced gain, detuning and Q reduction had detrimental effects on selectivity. Variation of filament voltage was, of course, a universally used method for gain control in the battery sets of the 1920's.

Probably the most common technique use to inhibit feedback was the "looser resistance, R, shown in Figure 2. This circuit was widely used and is typified in the Atwater Kent receivers of the 1920's. Since R appears in series with the grid to plate capacitance of the tube, it interrupts the feedback path. If made sufficiently large R will prevent oscillation. Typical values of R range from 50 to several hundred ohms or more depending on the other circuit parameters. With good design, a stage gain of 5 could be obtained on the 200 to 600 meter broadcast wave-lengths using the gain limiting techniques. Useful amplification at short wave-lengths (below 200 meters) was considered impractical or impossible by most radio engineers at that time. Thus was the state of the art until Professor L. A. Hazeltine introduced the famed neutrodyne circuit in which the troublesome effect of the grid to plate capacitance of the tube was neutralized by introducing into the grid circuit a signal which canceled the signal coupled through the grid to plate capacitance... Figure 3a shows one variation of the Hazeltine circuit. In this circuit the primary winding of the RF transformer is tapped. With this arrangement the primary coil end opposite the plate has a voltage out of phase with the RF voltage at the plate. The neutralizing capacitor, Cn, is adjusted to couple the proper amount of out of phase voltage into the grid to nullify the signal fed through the grid to plate capacitance. By neutralizing the effect of grid to plate capacitance, higher stage gains without oscillation were possible. Because of difficulties in maintaining neutralization over a wide tuning range, stage gains were limited to not more than 10 with good stability. Doubling the the stage gain did mean that a three stage amplifier could achieve a stable gain of as much as 1,000 compared to 125 for a similar amplifier without neutralization. A significant improvement, indeed.

The typical neutrodyne circuit is shown in 3b. The neutralization capacitor is conceited to a tap near the ground of the next stage grid coil. In principle, the circuit functions in the same manner as the circuit of 3a with the advantage that the neutralizing capacitor does not have the B voltage across it. The primary and

secondary windings of the RF transformer must be properly polarized to allow neutralization to take place. Additionally, the primary was frequently inter wound with the ground end portion of the secondary coil to obtain tight coupling.

Figures 3c and 3d show two other neutralizing circuits employed in receivers of the 1920's. Figure 3c is the RFL (Radio Frequency Laboratory) circuit used, for example, in the Majestic model 70 chassis.

In Figure 3c, L is part of the tuned circuit at the next stage grid but is oriented for minimum coupling to the other windings. L is wound on a separate form and is mounted at right angles to the coupled windings. If the windings are properly polarized, the voltage across L due to the circulating current in the grid circuit will have the proper phase to cancel the signal coupled through the grid to plate capacitance.

Again, balance is achieved by adjustment of Cn. The Rice circuit of Figure 3d uses a center tapped coil in the grid circuit. With this arrangement the signal voltages at the ends of the tuned grid coil are equal and out of phase. Cn is then adjusted to equal the grid to plate capacitance of the tube to effect complete neutralization. Figure 3d is the type of circuit used in the Radiola 60 and 62 IF stages. The principle disadvantage of the circuit is that the tuning capacitor is not grounded and makes the circuit difficult to employ in gang tuned RF stages.

The circuits shown in Figure 3 all fall into a general class of neutralization circuits known as bridge circuits. That is, the circuit is electrically equivalent to a balanced electrical bridge network where Cn is adjusted to achieve a balance. When Cn is properly adjusted, circuit gain is due to amplifying properties of the tube alone as the feedback path through the grid to plate capacitance is balanced out to speak. Many variations of bridge neutralizing circuits exist and find amplification today, especially in RF power amplifiers for transmitting equipment.

Up to now, neutralization has been discussed for what it is and does. Of equal importance to the collector is how to do it when aligning the old neutralized triode TRF or super heterodyne receivers. As a licensed radio amateur for many years, the author has read much on neutralization as applied to transmitting circuits but has seen almost nothing that related to the early alignment of the early broadcast sets. My first experience at neutralizing the broadcast set was as a teen-age nut in 1947. I had a

part time job in a radio shop which was rather handy as I was an avid builder and experimenter and my boss gave me a lot of junk to work with. One day one of the "old" AC TRF sets came in.. about a 1928 set, I think. The owner claimed that it was the first time in twenty years that the set had quit. The main problem was a bum filter capacitor which was promptly replaced. After that, I attempted alignment but the set set broke into oscillation when the trimmers were peaked. I asked the boss about about it and received my first lesson on neutralizing broadcast sets using a "dummy" tube.

The neutralizing procedure which follows uses the "dummy" tube technique and should provide generally acceptable results on most if not all of the neutralized triode RF and IF stages. Before continuing, however, the term "dummy" tube should be explained. A "dummy" tube is merely a good tube of the type used in the amplifier stage to be neutralized, but having one filament pin removed. If you didn't know before, now you know for what those tubes with the missing filament pin were used. Do not use a tube with shorts or open filament as a cheap substitute. Also a bad tube may have enough gas content to affect the results. If you simply can't part with one of your beloved 26's, 27's, 01-A's or whatever is used or needed, just put a piece of cellophane mending tape over one filament pin and use that for a "dummy"

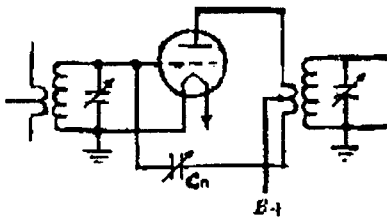


Figure 3a. Hazeltine

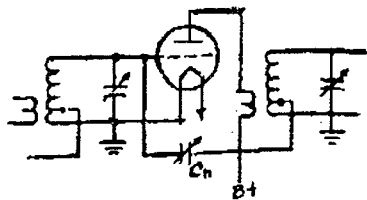


Figure 3b. Neutrodyne

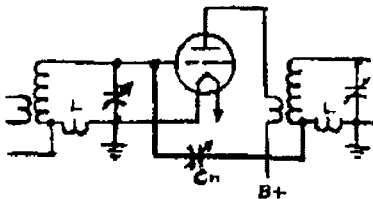


Figure 3c R F L

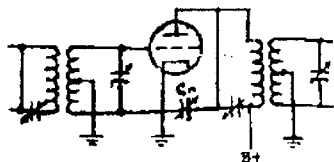


Figure 3d Rice

tube. Another method is to put a paper shim in the tube socket so that one of the filament pins doesn't contact the socket.

Alignment consists of peaking the trimmer capacitors of the stage to be aligned using a signal generator or broadcast station as a signal generator or broadcast station as a signal source. The signal generator is preferred since both frequency and strength of the alignment signal are adjustable. Alignment should always be done with all shields and covers in place. The RF trimmers are usually peaked somewhere between about 1,000 MHz to 1,400 MHz.. which ever gives the best tracking and gain compromise. If the capacitor has slotted end plates, these can be adjusted starting from the high end and working down to obtain nearly perfect tracking.

This can turn into a lot of work and generally isn't necessary unless the tuning capacitor was damaged. The IF stage should , of course, be adjusted to the recommended IF frequency which, if not known, can usually be located with the signal generator. If during alignment the amplifier breaks into oscillation, the alignment must be stopped and neutralization attempted. Note that the amplifiers must be checked at maximum gain for oscillation. AC sets using 26's ran at maximum gain since the gain control was in the antenna. Most battery sets used filament control so the RF gain must be advanced to maximum. Likewise, the cathode gain control used with 27's must be advanced. Back off the trimmer adjustment that caused the oscillation until oscillation ceases or else reduce gain control until oscillation stops. Tune to a strong station (or set generator) around 1,000 to 1,200 MHz and then plug the "dummy" tube into the neutralized stage next to the detector. Not all sets required neutralization of all stages. Be sure any shields and covers are replaced before proceeding. Using a non-metallic adjusting tool, adjust Cn for minimum signal output from the stage. Usually this point is very well defined. What has been done is to cancel out the signal coupled through the grip-to-plate capacitance of the tube.

Plug a "live" tube back into the stage just neutralized and plug the "dummy" tube into the next neutralized stage back. Again be sure all shields are in place and repeat the neutralizing procedure. Repeat for other stages until all have been adjusted. At this time repeat the r-f trimmer adjustment. It may be necessary to repeat the neutralization and r-f trimmer adjustment two or more times as the adjustments interact. Also, neutralization in

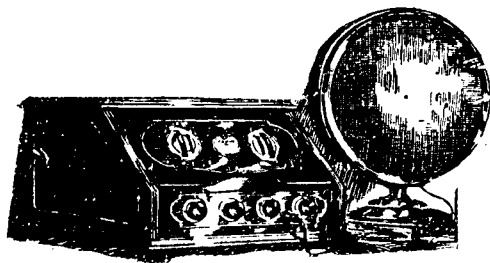
these circuits is not perfect at all frequencies and the amplifier should be checked for oscillation across the entire tuning range. Tuner r-f amplifiers are more prone to oscillation toward the high frequency end of the band so neutralization is usually carried out in this region.

The service literature, when available, should be followed. Sometimes the adjustment procedure will be somewhat different than the procedure described, although end results will be the same. Some RCA sets for example, employ one neutralized stage which is simply adjusted until the set doesn't break into oscillation anywhere in the tuning range.

If trouble is encountered with RF or IF alignment and neutralization, check to see that all bypass capacitors are in good condition and all grounds are solidly connected. All tube, coil and capacitor shields must also be in place. If these conditions don't exist, efforts to adjust the circuit may well be wasted. For those readers who have address of QST magazine, the article "R.F. Amplification-A Re-Hash" by Lyford in the November 1926 issue makes interesting reading. This article is addressed strictly to the problems of RF amplifier stability in receivers.

John Alford, W5TXL, is an avid radio collector with a strong interest in "cathedral" radios.

<http://home.navisoft.com/horn/alford.htm>





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# Swap Shop

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## WANTED

WANTED: National HRO 50 or 60 series communication receiver, or similar radios - Terry Burge (503) 678-2166

Wanted: Halicrafter S-38 in very good condition. Dave Thomson, 3521 SW Gale Ave., Portland, OR 97201,

Wanted: any parts or information on "NORCO" (made in Portland) 3-dial battery set; any Bremmer Tully "counter phase (sic) parts and pieces dead or alive, especially power supply parts for the military/secret service RP-6, RS-6 etc. Jim Barratt, 26313 SE Leonard Rd., Camas, Washington 98607, (360) 823-4429.

Wanted: Crystal Sets: Have radios to trade for crystal sets. Galen Feight (503) 231-9708.

WANTED: Vintage amateur radio receivers, AM transmitters, and other related amateur gear (circa: 1936 to 1960). ARRL Handbooks from 1935 to 1954. Ken Seymour (KA7OSM); 9115 S.W. 176th Avenue, Beaverton, OR 97007; 503-306-7439 days/eve. Email: ken.seymour@attws.com

## FOR SALE

For Sale: Over 200,000 tubes, panels, speakers, chassis, electronic surplus and supplies. R5-D3 Surplus. Bob Lee, 6111 SE 82nd Ave. Portland, Or. (503) 774-6560.

FOR SALE Oil-filled Capacitors, most are between 5 and 40 Mfd. AC or DC; AC Caps can take at least twice their rating when used on DC. \$1 each and up - send your needs **Bud Larson**, 1325 Ridge Way, Medford, Oregon 97504; (503) 773-5214

For Sale: National HRO 5TA1, metal tubes, 5 coil sets (4 general coverage and 10 meter band spread), home brew power supply and cabinet for speaker and coils. Clean and in good working order. \$350. **David Rutland, P.O. box 1084, Philomath, OR 97370, (503) 929-4498 e-mail WREN@PEAK.ORG.**

## Leads

FOR SALE: a 1950's Magnavox Custom made console Hi-Fi record player, radio, and reel-to-reel tape deck. Mahogany cabinet nearly 60" long. A quality piece of vintage equipment - \$100 or best offer - Call (503) 371-6171 (Salem, OR)

Notice:

The President of the  
NW Vintage Radio Society  
has called a  
board of directors'  
meeting  
for June 8th, 1996,  
directly  
following the  
membership meeting.

All officers  
should attend.



## The set you can depend on for *steady performance*

The important thing to know about a radio set is that you can count on it, always, to be clear and dependable. The farmer needs—not an ordinary set built for a price—but one of finest quality, to get distance clearly—to tune out interference—to perform *steadily* without attention—yet economically.

A Radiola 20 has *proved* it can be depended on. It brings in the lectures and the news clearly. The sporting events are real and live. And music comes through with a clear, full tone that is true to the finest artist's playing.

With its special "amplification," its five tubes have the distance reach of sets having *more* than five tubes. This same amplification helps to make it twenty times as selective as the or-

dinary set, because it amplifies *only the station you are tuned to.*

A single control brings in all the near stations, with the simplest one-finger tuning. And for far stations, there are verniers, too, to make distance tuning accurate and clear.



Radiola 20, with Radiotrons . . . \$115  
RCA Loudspeaker 100 . . . \$35

Radiola 20 has a power Radiotron that helps to keep the tone clear—even at big volume. This set can magnify a faint, far signal to natural voice volume—amplifying it one million times—yet keeping it clear and real. Test its tone quality against even far higher priced sets. You will not match it.

These are not mere claims, for they have been proved in the stern "road test" of experience. Every Radiola has the best skill of RCA—of General Electric—and of Westinghouse—behind it. And in Radiola 20, this background of long experience has proved itself in quality that stands up! It is just what the farmer needs—the finest set that has been built for antenna operation and low upkeep cost.

**RCA Radiola**  
MADE BY THE MAKERS OF THE RADIOTRON