



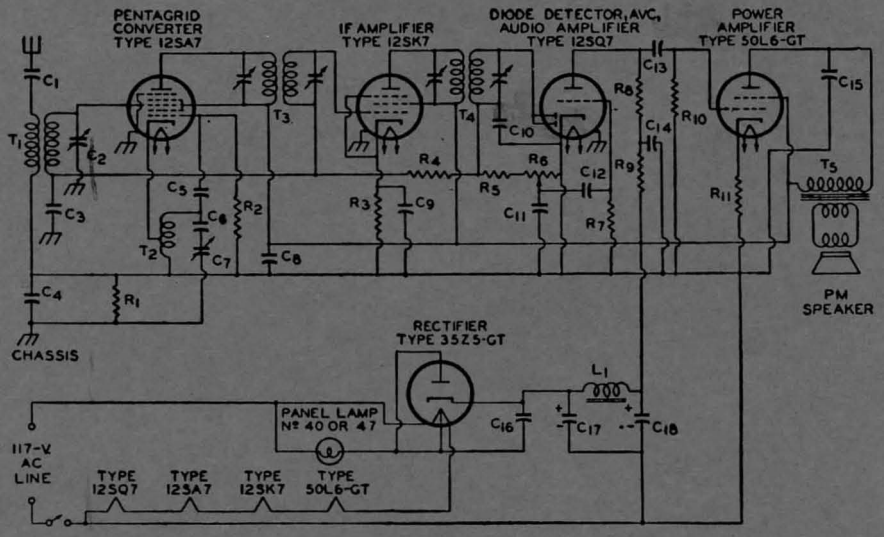
# CALL LETTER

Volume 18

August 1992

Number 8

## Troubleshooting AC/DC Radios



# CALL LETTER

## The Northwest Vintage Radio Society

The Northwest Vintage Radio Society is a non-profit historical society incorporated in the State of Oregon. Since 1974 NWVRS has been dedicated to the preservation and restoration of Antique Radio & Wireless apparatus.

The CALL LETTER was founded in 1974 by Harley Perkins (our first President). Editors have served as follows: 1975/77 Bob Bilbie, 1977/78 Bob Hay, 1978/79 Tom James, 1980 Bill DeVey, 1981/83 Jim Mason, 1983/87 Richard Karman & 1987/92 Edwin Buhite.

The Northwest Vintage Radio Society meets at the Northwest Vintage Radio Museum 7675 SW Capitol Highway (at 32nd St.) Portland, Oregon (Museum Phone (503) 246/3400.)

Business Meetings are held at 10:00 AM (Noon in December) on the second Saturday of each month except for summer vacation in August. The meetings are an opportunity to exchange information and advice. The July Swap is at Speed's in Keizer, Oregon. All Swap Meets begin at 8:00 AM.

Annual Dues: \$15-- Renewals are due January 1st

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# From the President's Desk

*David Dintenfass, PSARA president*

I'd like to thank **Max Kaplan** for his presentation on shortwave radio last month. It was a nice review of shortwave reception with the older table radios.

## August Swap Meet

I'm sure all of you are eager to participate in our annual swap meet this month. *Please review the following information carefully.*

Note that the inside section of this newsletter is a poster advertising the meet. If you can, post this in an appropriate place. Please don't post in places that have little chance of drawing customers (for example, the bulletin board at the local supermarket).

Please do not park in selling areas unless you have items to sell.

Remember that the swap meet runs from 9 am to 1:30 pm. If you are an exhibitor, please **DO NOT LEAVE EARLY** unless you have sold every single item. In past years, many individuals have left early. This disappoints many **PAYING** customers who often arrive around mid-morning and find that there's nothing left to buy. Please, stay until the end. If this becomes a problem again, we may institute a policy terminating the membership of any seller who leaves early.

## Upcoming Elections

Elections are in September. Please consider running for an office. Here is the current status of each office:

**President:** One member is considering the office, but has not said that he will run. *Please consider running for president.* I am not going to run again!

**Vice President:** Jim Gianacos will run again.

**Treasurer:** Al Atworth will run again.

**Secretary:** David Braun will run again.

**Museum Curator:** Ken Korhonen will run again.

**Correspondent:** Al Odmak will run again.

## Troubleshooting AC/DC Radios

*Pete Peterson, WY7Z, PSARA member*

The five tube AC/DC broadcast receiver was developed in the 1930's. Because of it's low cost and popularity, they were mass produced in the millions. Also because of low cost, many were discarded rather than repaired when they quit working. Those that remain are now collectable, or at least worth repairing and using because of their uniqueness.

Several of the most common problems in nonworking radios are easy to troubleshoot and repair, using no instruments other than an ohmmeter or continuity checker. A tube manual or an older ARRL Handbook containing tube data may also be necessary. The following discussion will help you repair about on half or more of nonworking AC/DC radios.

*When making repairs, BE SURE THE AC POWER PLUG IS NOT PLUGGED IN.*

First, remove the chassis from the cabinet and look for obvious troubles like burned or broken parts, shorted or open wires, etc. The most likely trouble to be found by inspection is a broken wire and/or cracked, rotten or frayed insulation on the AC line cord. Replace whatever is necessary. (This instruction applies to the steps below also.)

Check continuity from the AC plug blades to where the cord is connected under the chassis. Sometimes repeated flexing will break a conductor where the cord enters the plug or the chassis.

Some older radios have line cord resistors that reduce the 115V line voltage to that needed by the tube filaments. The resistor generates some heat so it was made of flexible resistance wire and built into the line cord like a third conductor, thereby dissipating the heat over the length of the cord.

If the line cord resistor is open or shorted replace the entire cord with a conventional two conductor cord. Don't bother trying to find a replacement LCR cord — there aren't any available. Replace the LCR with a wire wound resistor mounted where it won't cook anything, preferably on top of the chassis. What resistance and power rating? Use Ohm's Law to be sure. In a typical receiver, filament voltages total about 69V so dropping resistors of about  $150\Omega$  @ 20W for 0.3A tubes and  $300\Omega$  @ 10W for 0.15A tubes are often needed.

Turn the switch to OFF and put the plug in an AC receptacle. Turn the switch on and be alert for smoke, burning smells, sparking noises or other signs that the power should be turned off in a hurry. If nothing bad happens, leave the power on and allow about 30 seconds for tubes to warm up. If the tube filaments are OK, you can see an orange glow in glass envelope tubes, or feel warmth on metal envelope tubes. Filaments are wired in series so if one is burned out, none will work. To locate a bad one, remove the tubes one at a time and check for an open filament. Try the rectifier and audio power tubes first — they burn out more frequently than the others.

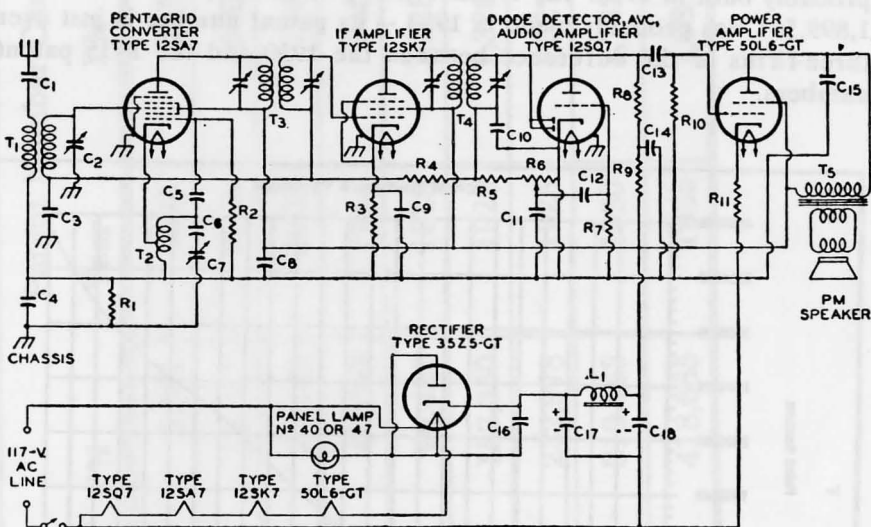
If a very loud hum or buzz is heard, the tubes are probably OK but the electrolytic filter condenser is bad. (We'll have none of that modern capacitor and megahertz talk here.) Turn the power off at once and replace the condenser. They have up to



three sections but don't try to figure out which section is bad, replace the whole thing. Replacement values aren't critical, any voltage over 150V will do, as will any capacitance within 50% to 200% of the original.

Lots of other troubles can make these radios work poorly or not at all, but my purpose here was just to cover the troubles you are most likely to find, not to write a book. After making repairs I like to clean the chassis, wash the cabinet and knobs with soap and water, and maybe touch up the finish or put on a coat of wax.

### AC/DC SUPERHETERODYNE RECEIVER



**C<sub>1</sub>** = 500  $\mu$ f  
**C<sub>2</sub> C<sub>7</sub>** = Ganged tuning capacitors, 365  $\mu$ f  
**C<sub>3</sub> C<sub>4</sub> C<sub>14</sub> C<sub>16</sub>** = 0.1  $\mu$ f, paper  
**C<sub>5</sub>** = 0.25  $\mu$ f, paper  
**C<sub>6</sub>** = 50  $\mu$ f  
**C<sub>8</sub>** = Oscillator padding capacitor—follow oscillator-coil manufacturer's recommendation  
**C<sub>9</sub>** = 0.05  $\mu$ f, paper  
**C<sub>10</sub> C<sub>11</sub>** = 250  $\mu$ f  
**C<sub>12</sub>** = 0.005  $\mu$ f

**C<sub>13</sub>** = 0.01  $\mu$ f, paper  
**C<sub>15</sub>** = 0.025  $\mu$ f  
**C<sub>17</sub> C<sub>18</sub>** = 40  $\mu$ f, electrolytic, 150 v.  
**L<sub>1</sub>** = Filter choke, 200 ohms, inductance as large as practical  
**R<sub>1</sub> R<sub>4</sub>** = 250000 ohms, 0.5 watt  
**R<sub>2</sub>** = 20000 ohms, 0.5 watt  
**R<sub>3</sub>** = 260 ohms, 0.5 watt  
**R<sub>4</sub>** = 2 megohms, 0.5 watt  
**R<sub>5</sub> R<sub>8</sub>** = 50000 ohms, 0.5 watt  
**R<sub>6</sub>** = Volume control, potentiometer, 250000 ohms  
**R<sub>7</sub>** = 10 megohms, 0.5 watt

**R<sub>10</sub>** = 0.5 megohm, 0.5 watt  
**R<sub>11</sub>** = 150 ohms, 1 watt  
**T<sub>1</sub>** = RF transformer, 540-1600 kc  
**T<sub>2</sub> T<sub>4</sub>** = Oscillator coil, tapped, for use with 365- $\mu$ f tuning capacitor, and 455 kc if transformer  
**T<sub>3</sub> T<sub>4</sub>** = Intermediate-frequency transformers, 455 kc  
**T<sub>5</sub>** = Output transformer for matching impedance of voice coil to 2500-ohm tube load

# Dating Vintage Equipment

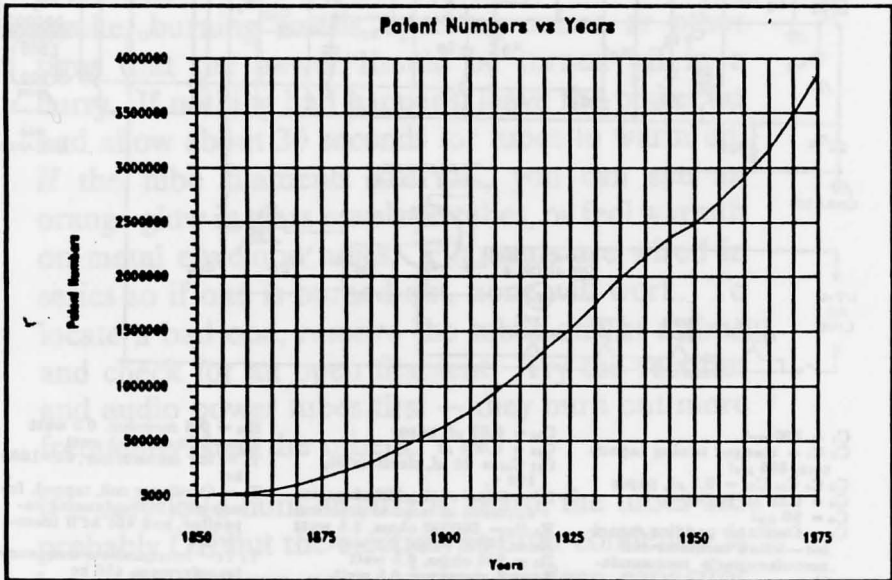
Pete Peterson, WY7Z, PSARA Member

Learning when something was made is often of interest to antique collectors, owners of family heirlooms, and pack rats like me who accumulate radios from the 1920s and 30s.

Here's an easy way to establish the year of manufacture of an item within a year or two, assuming it has a patent number on it somewhere. (If it has more than one number, use the highest one.)

Just compare your patent number with those on the chart and interpolate as needed. The chart shows the first patent number issued for each listed years.

For instance, my Patterson *All Wave* radio has patent number 1,762,431 which is just over the 1930 mark. This indicates that it was probably built in 1930. My Wards Airline Cathedral, with number of 1,899,561 was probably made in 1933 -- its patent number is just over three-fifths of the difference between the 1930 and the 1935 patent numbers.



Patent Number Interpolation Chart



Patent Number Chart

Year	PN	Year	PN	Year	PN
1850	6,981	1895	531,619	1940	2,185,170
1855	12,601	1900	640,167	1945	2,366,154
1860	25,279	1905	778,834	1950	2,492,944
1865	48,969	1910	945,010	1955	2,698,434
1870	98,481	1915	1,128,212	1960	2,919,443
1875	158,350	1920	1,326,899	1965	3,163,865
1880	232,978	1925	1,521,590	1970	3,487,470
1885	310,163	1930	1,742,181	1975	3,858,241
1890	418,665	1935	1,985,878		

de Pete WY7Z

# **PSARA Minutes**

## **Seattle, Washington 19 July 1992**

*David Braun, PSARA secretary*

[Editor's note: David prepared these minutes from a n audiotape of the July meeting since he was unable to attend the meeting.]

Our meeting was called to order about 1:05 pm. Attending were 28 members and 8 guests. The guest were Dennis and John Scheurell and Ernie Beetz for their first meeting and Louis Janson, Jonathon Winter, Gerry Hale, Eric Mootz, and Travis Donovan for their second meeting. Those attending for their second meeting were voted in as new members. I think this is a new record, five new members for one meeting! We also had a visitor from Minnesota; Dave Grout. He's a member of a radio club there.

### **Old Business**

The treasurer's report by Al Atworth indicated that we made a small amount for the club treasury from the auction in June. The director of the Shoreline Historical Museum, Vickie Hinson, has resigned to move to Long Beach. Al still has some copies of *Radio Manufacturers of the 20s, Volume III* for those of you who want one. Contact Al to buy a copy.

Museum curator Ken Korhonen reported that Jonathan Winter has supplied some Riders Manuals to fill out the club's set. Thanks Jon! Also, Ken is trying to take home some of his 40s portable radios to make room for others. Ed Buhite donated some RCA material to the museum. Thanks Ed!

### **New Business**

The Shorey Bookstore in downtown Seattle has several Riders manuals in the technical section. They are around \$15 or \$20 and they include mostly volumes in the middle 'teens.

Something sad to report—at the swap meet before today's meeting, Ed Curry reports that someone stole two tubes out of a radio that Ed had for sale. Either return the tubes or buy the radio next month. So watch your goods at the swap meets.

Also, it's been brought to our attention that a lot of non-members are showing up at swap meets. We had a discussion about the best way to control this (note that our annual August meet is open to the public)...

Start thinking about the September meeting which is our annual election of officers. Some nominations were solicited for various offices. [editor's note: please consider running for president] Most officers are willing to stay on another year.

After the business meeting, we had a nice demonstration of a home-brew one-tube set by member Tunken Bolin. Tunk also spent a few moments detailing the history of his fascination with scratch-built radios.

Our main presentation was a discussion on shortwave reception with the older radios by Max Kaplan. It included discussions about how to tune for shortwave broadcasts from foreign countries, what frequencies at what time of day are best, and what time of the year is best. Also, some basic construction practices of early communications sets were discussed. As an active shortwave enthusiast, I'm sorry I missed it. Thanks very much Max.

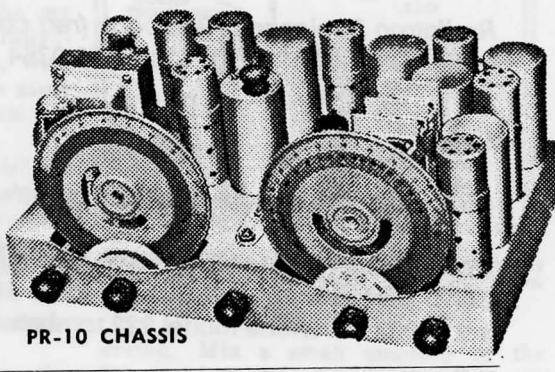
Don't forget the 16 August swap meet. Hours are 9 am to 1:30 pm. Please do not leave early!

'Til next time, David Braun

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# SWAP SHOP

## For Sale

*Riders Volume 1-13, \$250. Seeburg Jukebox Amplifier and speaker, \$75. Westinghouse RA/DA Receiver, \$200. Jerry Cappoen (206) 874-5490*

*Tubes, electronic test equipment, receivers, parts. Bob Lee at R5-D3 Electronics Surplus. 6111 SE 82nd Avenue, Portland, Oregon 97266. (503) 774-6560*

## Wanted

*SAMS 400 to 499. Gordon Phillips, 610 NE Royal Ct., Portland, Oregon 97232. (503) 234-3517*

*PBX telephone switchboard. Pete Peterson. (206) 747-1323*

*Atwater Kent small fine-tuning knob (as on AK 40). Also, tuning knob and shaft for AK 55 or 60. Jerry Brannon. (206) 854-4234*

*Philco 90 or cabinet for same. Sky Chief radios, Crosley 59 Chassis (used in 1930s "Rep-woods"), small "boy's radio" type transistor sets. "Radio Retailing," "Radio and TV News," and other similar magazines. Pre-1950 TV sets and literature. Ken Korhonen. (206) 932-9363*

*Radiotron Designer's Handbook (red cover, 4th edition). Grunow 801A radio. Darrell Forsberg. (206) 363-0754*

## OLE

[Editor's note: The July PSARA "ole" items will appear next month]

**Scott MacGregor:** 1931 Philco 90 Cathedral, original condition. 1940 Zenith 6D413 brown Bakelite table set. 1933 Dewald peak-top tombstone set. 1932 Silvertone model 222 tombstone.

**Ray Nelson:** Chelsea Radio Co. enclosed variable condenser. Early two-pole Murdock antenna knife-switch.

**R.A. Dielschneider:** Silvertone model 4586 console. Admiral model 6C71-10A1 chassis console. Philco Jr. Cathedral model 81. Airline model 62-123 console. Airline model 62-358 console. Sparton tombstone (no model number). Philco model 42-380 console. Continental model 7M wood table radio. Zenith model 7S 262-A table radio. Zenith model 6S 661 console. Zenith model 6S 362 console. Silvertone model 4586 console. Western Royal model W261 console.

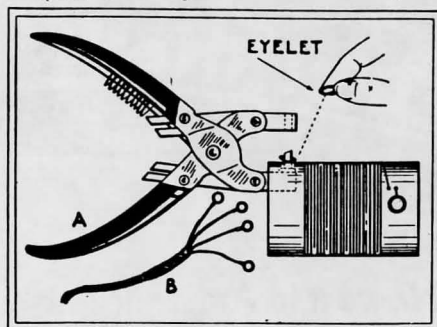


FIG. 9—A, simple eyelet punch used to form terminals on a coil; B, a cable with neat eyeletted terminals.

### A CONVENIENT TERMINAL

By Russell L. Woolley

MORE and more, pressed eyelets are being used in the manufacturing of radio parts. Radio-frequency transformers, R.F. choke coils, connector strips, and the ends of the wires of a cable are all parts of a radio receiver where eyelets may be used to advantage. Perhaps the most notable example of the use of punched eyelets is the A. K. terminal strip.

Now then, the point is that the set builder may also use this comparatively simple manufacturing process, with practically no expense; and at the same time, make a really neat job of his experimental home-made apparatus.

The use of the punch and eyelet kit is illustrated in the accompanying drawing. Here the punch pliers is shown, inserted into a hole drilled in the solenoid coil form. To use, without removing punch from hole, put on the eyelet over the punch—small end down—and close tool. (Fig. 9A.)

A second illustration, suggesting the use of punched eyelets, shows a dynamic speaker's four-wire cable with eyelet terminals. It is apparent that, when these terminals are put on a 6/32 or 8/32 machine-screw binding post, they cannot come loose. (Fig. 9B.)

### RULING PEN HANDY TOOL

By Arthur Bernd

IN putting nuts on bolts in tight corners and down deep in the set, I use a

draughtsman's steel ruling pen, which (as you know) is shaped like a pair of tweezers, with a stud running through to tighten it.

By placing the nut in the ends of the pen and screwing down on the stud, it is easy to set the nut on the bolt; after a few turns the pen is withdrawn and the job finished with a "spin-tite" or wrench.

### REPAIRING SCREEN-GRID TUBES

By Frank C. Atkinson

DON'T throw away a screen-grid tube if the control-grid tip should pull off the top, leaving only the lead sticking up. Clean out the cap, and around the top of the bulb; clean the end of the control-grid wire, and solder to it a short length of fine wire.

Then, procure from a paint store a small amount of litharge (yellow oxide of lead) and a small quantity of gly-



FIG. 10—The loosened cap of a screen-grid tube may be cemented back into place, quite satisfactorily, in the manner shown.

cerine. Mix a small quantity of the litharge into the glycerine, until a stiff paste is formed; pack the grid cap with this, and run the control-grid lead of the tube through the paste and out from the small hole in the cap. Press the cap down upon the glass, clean away the excess paste; and allow this cement to set for twenty-four hours. Then clean the cap, and solder the end of the wire to it; and the job is finished. You will find the tube as good and as strong as new; I have used this method for some time and it has never failed me. (See Fig. 7.)



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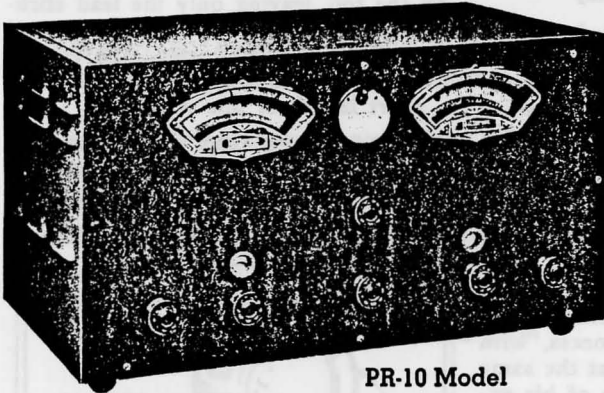
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Easiest, smoothest ever built.  
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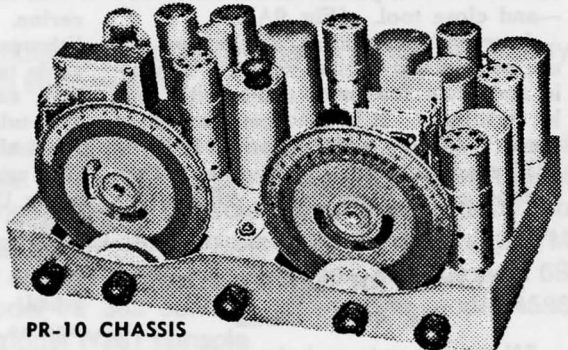
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