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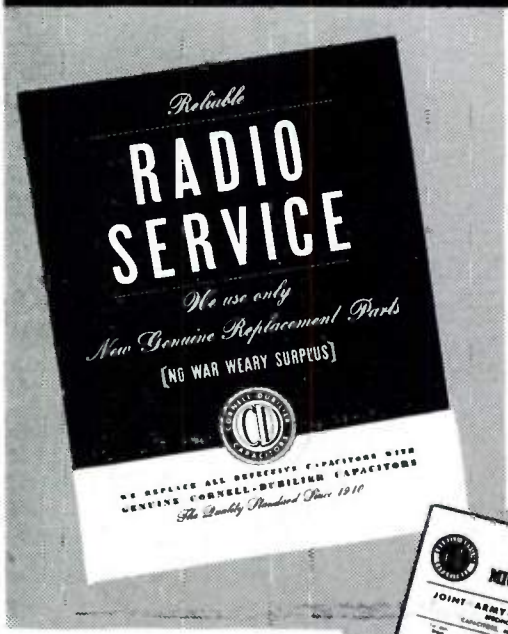

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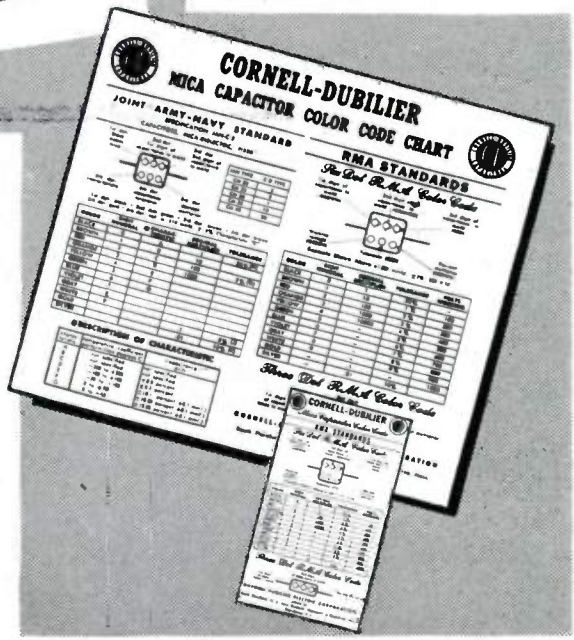

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LINE CORD VOLTAGE BANK*

While the voltage bank described in this article was designed especially for the beginner and experimenter, this unit may also be used to advantage by the radio serviceman.

The small voltage bank drops the a.c. line power voltage to the proper value for receivers, experimental uses and for servicing radio receivers that employ line-cord resistors.

The unit is very simple in design and construction. A universal line cord is used with a single-pole, four-position switch and three small insulated phone jacks. The universal cord contains six flexible wire leads, the leads being color coded as follows: long brown lead, 330 ohms; yellow wire, 308 ohms; blue wire, 264 ohms; and the green wire, 176 ohms. The other two leads are black and red. The red terminal is internally wired to the resistance side of the line, while the black wire is the other side of the line.

The wiring of the voltage bank is very simple and may be completed in a few minutes. After the unit is wired it is ready for a performance test. One excellent method of checking the wiring is to use a small ohmmeter with one terminal lead in No. 5 and the other ohmmeter lead in the resistance jack. The small switch can then be rotated and the ohmmeter will indicate the actual resistance.

If a small ohmmeter is not available, vacuum tubes may be used to indicate correct application. At terminal 4, as shown in Fig. 1, the voltage drop is 52.8 volts at .3 amperes, allowing 57.2 volts for external application. For example, it would be possible to use two 25-volt tubes plus one 6,3 volt vacuum tube, or five 6.3-volt tubes plus one 25-volt vacuum tube to obtain the correct heater voltage drop. Of course, all of these tubes are wired in series and must have the same current drain. Equivalent diagrams are shown in Fig. 2. This small unit was constructed primarily for .3 ampere vacuum tubes.

At terminal 3, which equals 264 ohms, the line voltage drops to 30.8 volts with a drain of .3 amperes. Here, a 25-volt tube could be used, plus one 6.3-volt vacuum tube or five 6.3-volt tubes. Terminal 2 contains 308 ohms which drops the line voltage to 17.6 volts. With this setup, three 6.3-volt tubes could be heated. Ter-

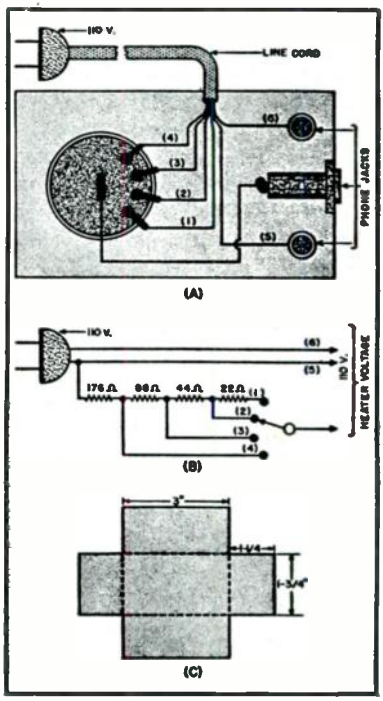


Fig. 1. Wiring diagram.

*By Sgt. H. L. Davidson in "Radio News."

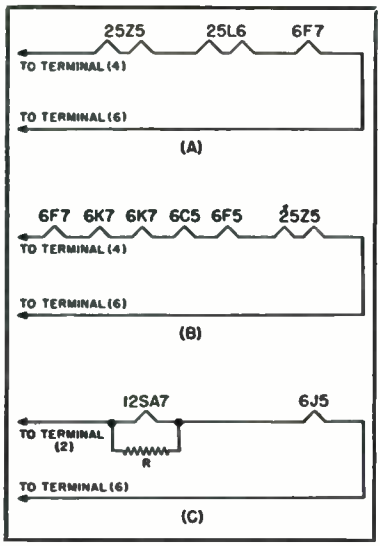


Fig. 2. Typical series filaments that may be operated directly from this unit. Other tube combinations may be used.

minal 1 has the greatest resistance in ohms and thus the greatest voltage drop, decreasing the a.c. line-cord voltage down to 11 volts. At this switch position, two 6.3-volt vacuum tubes could be used.

If it is deemed desirable to connect, in series, tubes which have different current and voltage ratings, the following formula may be used to find the required shunt resistance. This shunt resistance goes across the vacuum tube having the smallest current rating. The correct formula for such a determination is:

$$R_s = \frac{E_1}{I_2 - I_1}$$

where R_s is the shunt resistance
E_1 is the filament voltage of the vacuum tube with the lowest current drain
I_2 is the current drain of the tube with the highest drain
I_1 is the current drain of the tube with the lowest drain.

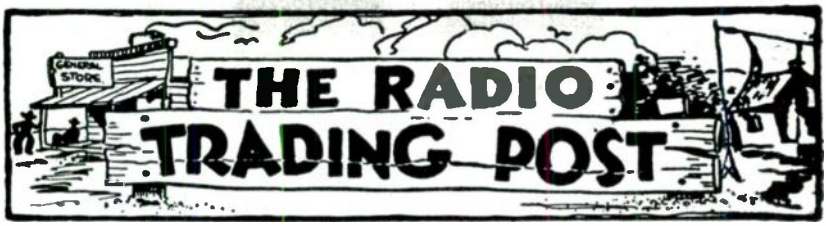
For example, consider two tubes connected in series, such as a 12SA7 and a 6J5. The required line-cord voltage bank is 308 ohms, which is terminal 2 or the yellow wire. The 6J5 draws .3 ampere of current, while the 12SA7 draws .15 amperes from the line. Using the formula given above, the required shunt resistance for the 12SA7 is 80 ohms.

To determine the amount of resistance needed to drop the voltage to the proper value for the vacuum tubes being used, the Ohm's Law formula should be applied. The tubes to be hooked in series must have the same current rating or employ a resistance shunt. The voltage drops of the various tubes must first be added together, this value is then subtracted from 110 volts and the result is then divided by the same current value to find the correct dropping resistance. A tube manual is a handy reference for this purpose.

The line-cord resistance will get fairly warm, but this condition should not be considered abnormal.

The constructional data for the chassis is given in Fig. 1. The chassis material is soft aluminum. The all-over size of the unit is extremely small. A small black pointer knob adds to the appearance of the voltage bank. Two red, insulated phone jacks and one black jack give the unit a commercial appearance.

This unit is valuable for the serviceman as well as the beginner and experimenter. When a line-cord resistor goes out on an a.c. receiver, this unit can be switched into the circuit rapidly. The required dropping line-cord resistance can then be read directly from the voltage bank dial.



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FOR SALE—New radio tubes at OPA list. Send for list. Also condensers, PM spks., resistors, cabinets, books , etc. What have you and what are your needs? Andrea Radio, 107 Franklin Ave., Rochelle Park, N. J.

FOR SALE—Browning FM tuner BL3000A with power supply, 40-54 mc, also some 2A7 tubes. Herb. Grosser, 24 Birch Ave., Methuen, Mass.

FOR SALE OR TRADE—35 mm motion picture projector and camera; also photo equipment. Want—Radio and chemical tech. books, microscope, recorder. Hansen Radio Service, 165 Silverbrook, Niles, Mich.

FOR SALE—Ham built communication set. No power supply or speaker, $25. 25 lb. junk box of mostly new parts, $10. Television-radio cor. course, $25. 60 ft windcharger tower $25 delivered Washington vicinity. K. H. Stello, 925 Monroe St. N.E., Washington 17, D. C.

FOR SALE—Johnson 200DD35 split stator transmitter condenser 202 mmf. each section, 3750 v. breakdown rated. Also same make 200FD20, 207 mmf. each section, rated 2000 v. breakdown, used as grid cond. with above. First $10.00 takes both. F. Craven, 2216 So. 7th St., Philadelphia, Pa.

FOR SALE—110v. input, 300 v. 100 ma., 1v, 2v, and 5v output. With 80 tube. Highest offer. Russel E. Martin, 140 Orange St., Elizabethtown, Pa.

FOR SALE — Brand new Temco radio transmitters, Model 250GSC. Over 200w. output on phone or cw, ready to go on air, extra tubes and parts. Fq. from 2 to 16 meg. continuous tuning. 4 pos. xtal or ECO. $2,000.00. John Kozma, 3104 Wilkinson Ave., New York 61, N. Y.

WANTED—Rider's Manuals 6 to 13, also radio tubes, send list. Want signal gen., state price and condition. Castle Hill Radio Shop, 2228 Newbold Ave., Bronx 61, New York, N. Y.

FOR SALE — Six CX-301A tested tubes, Sterling dc voltmeter 0-300, Grebe radio, batt. table model less batts., tubes in, extras. Two extension type loud spks., complete antenna kit new, 38 cal. revolver. What offered? Geneva Tolley, 217 East Broadway, Clayton, N. M.

FOR SALE—Crosley Fiver, 5 tube ac super, table model, two bands, almost new, $35. Also Majestic personal portable, with cartoned set of batteries, $18. G. Samkofsky, 527 Bedford Ave., Brooklyn, N. Y.

FOR SALE—Radio tubes, most any kind. Send for catalog. Also acorn tubes 954 to 959, 75 cents each guaranteed. Sable Radio, 7 Dyer St. Dorchester, Mass.

SALE OR TRADE — Clough-Bringle OMA sig. gen. and oscilloscope; McMurdo Silver IV-A Masterpiece all-wave chassis power unit and spkr. complete, Temple broadcast band comb. rec. Motorola car set; elec. vac. sweeper, elec. hair clippers. Glenn Watt, Chanute, Kans.

FOR SALE—Proceedings Inst. of Radio Engineers, bound vol. 1918. Complete sets, unbound, 1922, 1923, 1925, 1926, and 1927. Index 1909 to 1926 inc. Complete set, unbound, Journal of Franklin Institute, 1937. Paul Cloke, 49 Forest Avenue, Orono, Maine.

FOR SALE—Precision VOM new, checks voltages 0-7.5, 0-15, 0-150, 0-750. MA 0-7.5, 0-75; ohms 0-35 to 0-500,000. Cost $42.80, first $30.00 takes it. Bert Buckner, 280 W. Central, St. Paul 3, Minn.

WANTED—Late NRI course. State price and whether experimental equipment included. Frank Jarosz, 562 W. 113th St., New York, N. Y.

SELL OR SWAP — Four Marconi-Victor wireless telegraph phonograph records for code practice; also Omnigraph with discs or plates for telegraph, with sounder; make offer. Victor J. Kubanyi, 87 Carroll St., City Island, New York 64, N. Y.

SWAP—Ihagee 3½x4¾ filmpack camera with f 4.5 Compur shutter, 8 holders, accessories, for good communications receiver. Robert Cobaugh 35-34 Bell Blvd., Bayside, N. Y.

FOR SALE—1 new Dietzgen slide rule. Send money order for $2.00. Want single shot .22 rifle. Bobby Ward, Woodleaf, N. C.

FOR SALE—I. R. E. Proceedings complete, well kept, Vol. 13, 1925 to Vol. 32, 1944 with index. Best offer, F.O.B. Boonton, N. J. Harry A. Bremer, 43 Washington Ave., Lake Hiawatha, N. J.

SALE — Latest complete NRI course in practical radio, radio servicing and merchandising, 65 lessons, including television servicing, also vacuum tube voltohmmeter included in course, tube and battery. Searcy, 1916 Fern Street, New Orleans 18, La.

FOR SALE—Radio parts, many hard to get radio tubes. Send order now, I will ship COD if in stock, don't send money. May I substitute. Interested in buying a typewriter. Worden Radio Shop, 121 Maple St., Friend, Nebraska.

WANTED—U. S. or foreign stamp collection and opera glasses. Will trade Monarch portable typewriter, radio receiving and transmitting parts, tubes, meters, mikes, phono motor, turntable, pickup, etc. Bernard Bernbaum, 5746 N. Park Ave., Philadelphia 41, Pa.

FOR TRADE OR SALE—Webster 15 watt PA system, complete with floor stand mike. New Electro Voice model 50 carbon mike. Trade for tube tester that tests all tubes, or good typewriter. Max Shively, 3115 Ingham Rd., Lansing 10, Mich.

WANTED—Riders 7 to 13 in fairly good condition, signal generator and tracer, tubes and other servicemen's supplies. Send list. Garfield Hts. Radio & Electric, 4471 E. 131st St., Garfield Heights 5, Ohio.

WANTED — A couple of thermo-couple ammeters, ranges 0-2.5, 0-5. Could use Thordardson T14C70 tone control choke. Abel Gomes, 8 Duke St., Ludlow, Mass.

WANTED—A heavy duty 115 v. ac powerpack to furnish about 10 amps., 8 to 12 v. filtered dc to supply storage battery radio. L. C. Chapman, Rt. 1, Columbus, Miss.

FOR SALE OR TRADE — Kodak No. 116 special, f 6.3 B. & L. Tessar lens, rangefinder, shade and filter holder, two filters, six rolls film. All in perfect condition. $85 or RCA Chanalyst, A. Grayson, 2885 Valentine Ave., Bronx 58, New York City.

WANTED—Good panel type mounting receiver such as Hallicrafter, National, Tammerlund, want 3 860, 1 861 and other large tubes. Trade or cash. N. K. Stover, P.O. Box 722, York, Pa.

FOR SALE—Combination Triplett oscillator 1151, VOM 1125, oak case; 69 radio tubes (including lock-ins); 46 adapters for substitutions. Write for list. $135.00 or best reasonable offer. Leroy Barber, 1014 Woodlawn Ave., Ann Arbor, Mich.

GERMAN TUBES NEEDED—Phillips UCH-21, Osram EU-XX 35-70V0, 2Ab36, also need tube characteristic sheets and tube tester for European types and service notes on same. What have you and if cash or trade. Richard G. Devaney, 216 South 60th St., Philadelphia 39, Pa.

FOR SALE—Triplett mod. 677 dc vltmtr., 1000 v., No. 675 dc milliammeter; No. 673 ac vlmeter 0-1000 v., No. 678 ohmmeter, 0-10 meg.; leather case $15 each. Triplett 1200-E, $30; sig. gen. mod. SG, $40; Philco record player, $50. Elizabeth H. Beebe, Vivian St., Rfd. 2, New London, Conn.

FOR SALE—German aircraft transmitter-receiver (42-48 mc) unit. Dynomotor unit separate. Equipment never been in operation. Diagram and data, in German, of earlier model included. Best offer takes. Pfc. H. Schutzman, 1662 Hoe Av., Bronx 60, New York.

(Continued on page 14)

LOUDSPEAKER ADDITIONS FOR IMPROVED TONE QUALITY*

Additional speakers offer an effective means of improving tone range and overall fidelity. In many cases we find that high-frequency distribution is poor in the average room. An extra speaker, properly installed, can improve that condition. The extra speaker, mounted away from the console, also often adds to the depth of response.

In Fig. 1 we have one method of installing the extra speaker. While an impedance mismatch results, the use of this circuit in actual practice seems fairly satisfactory. If the power is to be distributed evenly between the speakers, the voice coil impedance of the extra speaker should be about the same as that of the original speaker. The extra speaker can be a p-m dy-

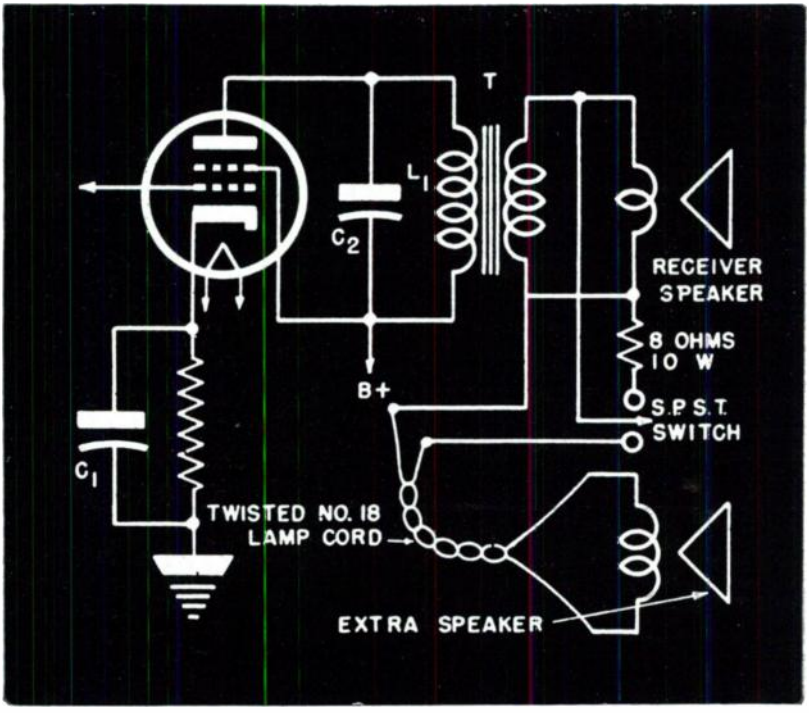
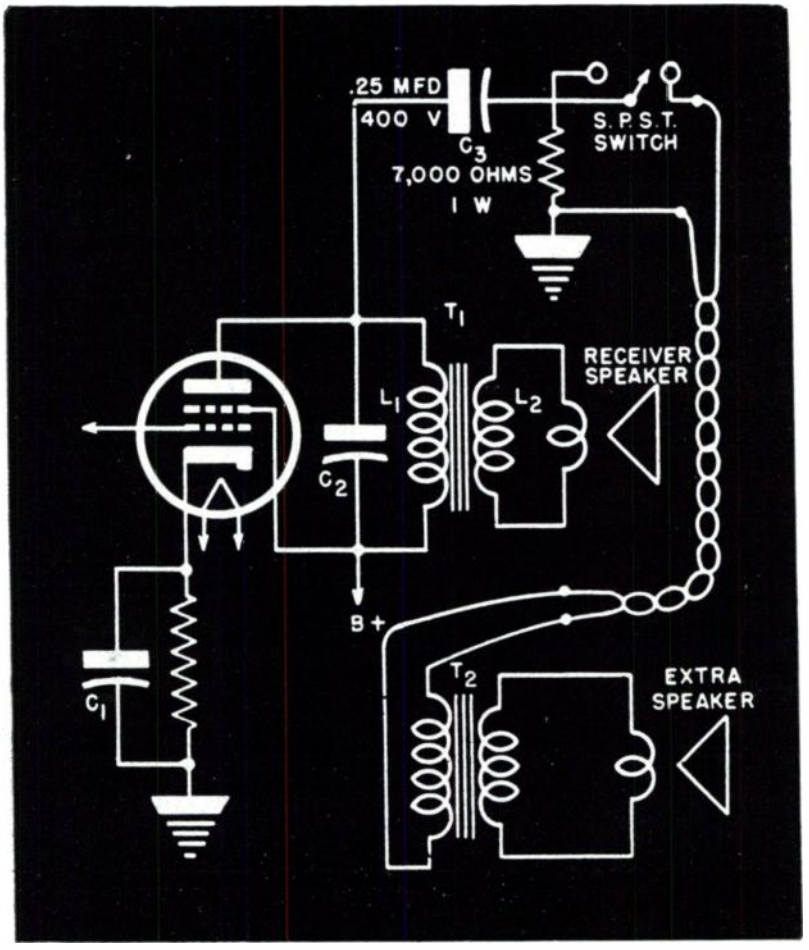


Fig. 1 shows a method of connecting an additional pm speaker: the 8-ohm resistor will keep the volume of the receiver speaker at a constant level, whether the additional speaker is connected or not.

** By Willard Moody in "Service" magazine.*

namic type with a 10 in. or 12 in. diameter cone and a baffle which will permit adequate reproduction of *lows*.

Of course, it is possible to connect the extra speaker of Fig. 1 in a permanent way. The switch is omitted, and a new output transformer installed. This output transformer would have a turns ratio *N*. If the original voice coil was 8 ohms and the extra coil had an impedance of 8 ohms, the new impedance would be 4 ohms. This value of impedance would be divided into the plate load resistance (obtained from a tube chart) to find the impedance ratio. Then, the square root of that ratio would be equal to *N*. The ratio can be checked by connecting an audio signal generator to the voice coil winding, adjusting the applied



In Fig. 2 we have the same hookup, using a separate output transformer; the 7,000-ohm resistor keeps the tube load constant.

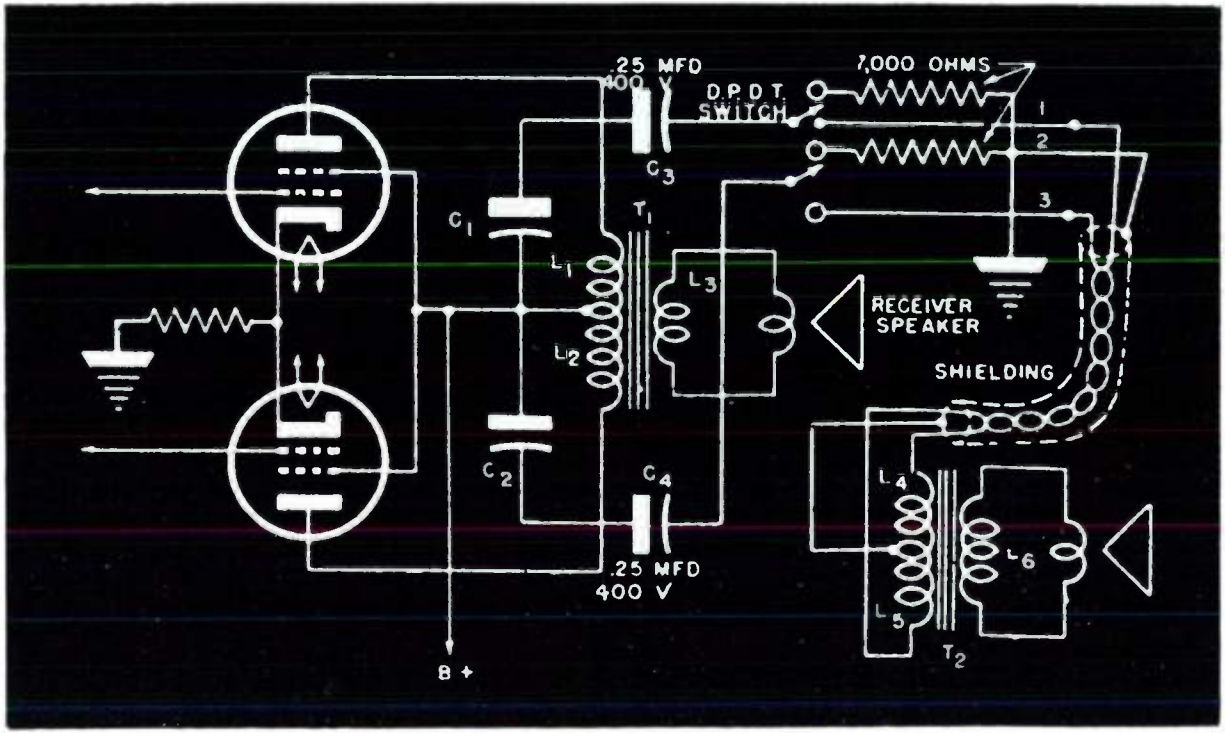


Fig. 3
How to connect an extra speaker to a push-pull output stage. Two 7,000-ohm resistors are necessary to keep the plate load at a constant value, when the extra speaker is not in use.

voltage to 1 volt and then measuring the voltage across the primary or plate winding. The ratio of the plate winding voltage to the secondary voice coil voltage of 1 volt would be equal to the turns ratio.

The extra-speaker practice can also be applied to auto installations. Thus equalized distribution of sound is possible. The circuit of Fig. 1 may be used for this type of installation, too.

The extra speaker also can be hooked up as shown in Fig. 2. To equalize power distribution, the turns ratios on the transformers should be identical. If a 6F6 were used, the turns ratio selected for T_2 should provide a match of the extra voice coil impedance to a 7000-ohm load. In another method, the turns ratio of each transformer, T_1 and T_2, could be used. That is, the turns ratio of each transformer would reflect 14,000 ohms back into the plate circuit. Then, we would have two impedances of 14,000 ohms in parallel, or 7,000 ohms, and a match with the 6F6 would prevail.

If continuous impedance matching is desired, the switches used can be of the single-pole, double-throw type. A dummy load resistor can be connected in place of the extra loud-speaker impedance so that no change in the output of the main speaker occurs when the extra speaker is cut on or off. The balanced arrangement of Fig. 3 requires a double-pole, double-throw switch.

To avoid using a three wire cable (Fig. 3), the shielding of a two wire cable is employed as the *third conductor*. The high-resistance plate-load substitutes of 7,000 ohms may be 1 watt types.

In many cases it may be desirable to have separate control over the volume and tone of the extra loudspeaker.

Let us suppose that a speaker were to be insfalled in the downstairs playroom of a private house. A special amplifier with a 6SQ7, 25L6, and 25Z5 could be used to offset losses in the cable line. This additional stage also provides a high level of impedance to the input. If the output impedance were 8 ohms and the extra loud-speaker had an impedance of 8 ohms, the power would be divided equally between the speakers. Thus the extra speaker would absorb power from the main speaker. By using a 500-ohm line unit between the receiver output and the special amplifier input, the power absorption can be cut to a very low if not negligible value.

Assuming the input impedance of the special amplifier to be about 250,000 ohms, the turns ratio on the amplifier input transformer (using a 500-ohm line) would be

$$N = \sqrt{\frac{250{,}000}{500}} = \sqrt{500} = 22 \text{ (approximately)}$$

An output transformer having a turns ratio of about 23 or 22 to 1 could be used for the input unit in the special amplifier circuit. The low impedance winding would be connected to the line and the high impedance winding would be connected to the grid and ground, or B —. The low impedance winding will have a very low resistance for d-c, generally less than 1 ohm, while the high Z winding may have a d-c resistance of between 100 and 300 ohms, depending on the quality and type of transformer.

Any volume loss due to an impedance mismatch at the receiver, so far as the special amplifier is concerned, can be made up by gain in that amplifier, and the tone can be corrected by the proper setting of the variable resistance in the plate circuit of the 25L6 output tube. If the special amplifier is to be used for phonograph reproduction, a single-pole double-throw switch in the input can be moved over to a phono position. The tonal quality can be controlled by a 100,000-ohm resistance, but some attention should be given to the acoustics of the playroom. If wood panelling can be used to line the walls, better tone will result; the multiple reflections produced by the hard concrete walls of stone surfaces, will not, then, be experienced. Added sound absorption will also be provided by wood or linoleum covering for the floor.

SERVICING MESSED-UP SETS*

Recognizing "Tampered" Circuits. Tube Misplacements. Incorrect Tube Element Connections.

A great increase in the number of "messed-up," or incompetently serviced sets, is reported by radio servicemen in many parts of the country. Spurred on by the technician shortage, janitors, electricians, school boys and set owners are trying their hand at repairing radios—with sorry consequences for the radios. Not infrequently, the sets are so badly botched up that the dealer into whose hands they finally fall refuses to service them.

Degree of Tampering

One of the greatest service difficulties often present on these jobs lies in the determination of just how much tampering has occurred. A mechanic who finds indications of tampering in some circuits may incorrectly assume that other circuits have been disturbed, too. In one instance, a none too expert radioman who saw a filter choke wired from the plate of a 25Z5 rectifier to ground, assumed that it belonged in the B plus supply. If a model number had been present on the set, making it possible to refer to the schematic, or if the mechanic had possessed a greater knowledge of theory, he would not have contributed, as he did, to the further messing-up of the radio.

A good procedure to follow in cases where tampering is suspected, is to examine the solder connections. The hall-mark of incompetent servicing is most usually a sloppy job of soldering. If the soldering is neat and professional looking, the chances are that no messing has occurred.

Even where sloppy soldering is present, however, caution should be observed in deciding whether a circuit has been incorrectly serviced. An unfamiliar, odd-seeming circuit (see Fig. 1) in a set that shows signs of

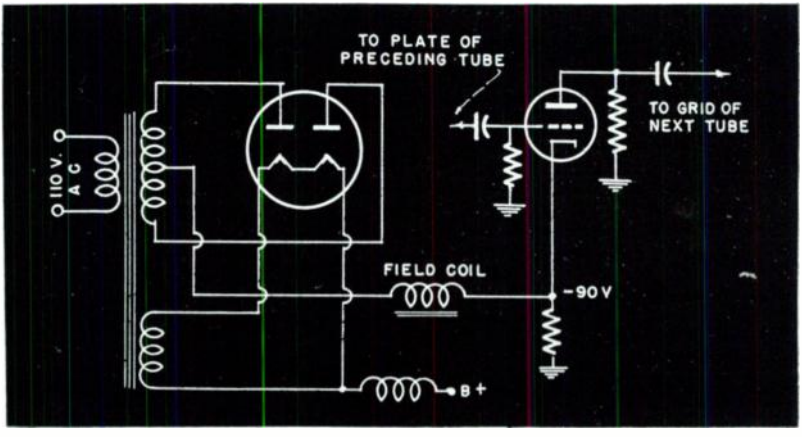


Fig. 1. An inexperienced radioman might deduce that the absence of plate voltage in this circuit was due to tampering. The expert would, however, recognize that a 90 v. potential difference exists between cathode and plate, producing a current flow.

* *Courtesy of "Radio and Television Retailing."*

tampering, should be carefully analyzed. If any doubt is present as to whether the original design has been altered, the circuit should be left alone, and other sections tested for the trouble.

of this sort is suspected, voltage tests at the socket constitute the best procedure.

Voltage Indications

Absence of filament voltage on any tubes may indicate that they are in

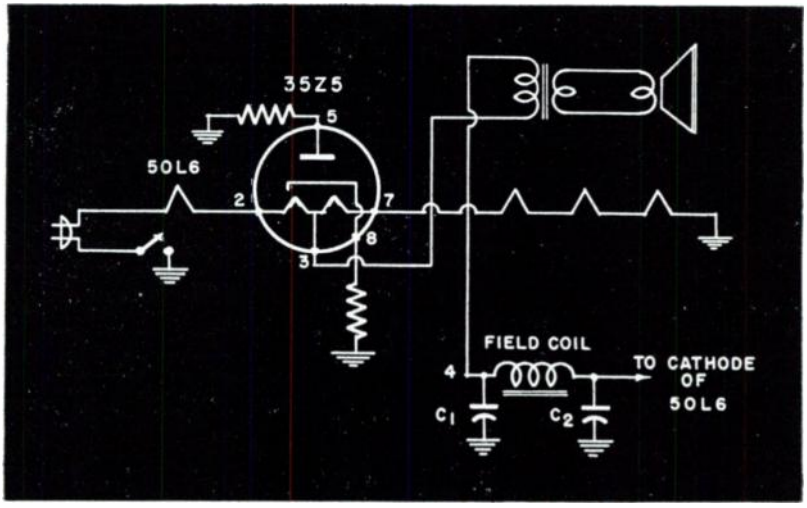


Fig. 2. Instantaneous appearance of hum when an ac-dc midget is switched on is a symptom typical of a reversal of the 35Z5 and 50L6 tubes. Diagram above shows circuit that results. 60 cycle ac supply current travels through output transformer to ground through C1. The portion that travels through field coil to ground through C2 causes the hum.

Suspicious Hook-up

To illustrate, a case may be cited where a radioman found a plate of a 6P5 tube hooked to its cathode, with no voltage to B— from either element. The radioman raised an eyebrow at this hook-up, but left it alone, and went on to correct other, more obvious tampering. Later, when the repair was complete, he discovered that there was nothing wrong with the 6P5 hook-up, the control grid being apparently used as a diode plate.

Set owners, after bringing in tubes separately for testing, often insert them into the wrong sockets. On ac-dc midgets, this trouble is usually readily apparent (see Fig. 2). On large sets, however, the difficulty may not be as obvious. When a condition

the wrong sockets. To take a simple case: no filament voltages were present on a 12SA7 and 12SQ7 of a large complicated receiver. Examination showed that the filament supply leads went to contacts 2 and 7 of the 12SQ7, and to 7 and 8 of the 12SA7 —a certain indication that the tubes had been reversed, because filament prongs are 2 and 7 for the 12SA7, 7 and 8 for the 12SQ7.

Absence of plate or screen voltages on prongs where they should be present, or the presence of high positive voltages where they do not belong, may indicate tube misplacement. When voltages are not noticeably disturbed by the interchange of tubes, however, detection of the trouble may not be too easy (see Fig. 3).

Here are some actual instances of tube misplacement, with clues that helped in diagnosis:

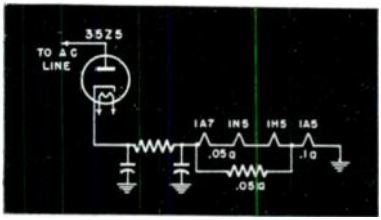


Fig. 3. One radioman had a difficult time detecting incorrect substitution of 1A5 for 1Q5. Eventually he realized that a .05 drain tube does not belong in .1 amp. circuit.

78 used for 6C6. The radioman's knowledge that a 78 is never used as a detector was the only clue in this case.

12K7 and 12A8 interchanged. Clues: Grid lead of 12K7 was somewhat longer than necessary, and had some slack in it. Grid leads are normally as short as possible to prevent hum pick-up. A second, even more obvious clue, was the fact that the grid lead to the 12A8 emerged from an i-f shield can. No grid lead to an r-f tube should come from an i-f circuit, of course.

7C6, 7A8 interchanged. Clue: Capacitor that normally couples the control grid of the power tube to the detector plate, was making connection to a 7A8 tube element. Obviously the 7A8—a converter tube—has no business to transact with an audio coupling capacitor, whereas the 7C6, a detector tube, should not make connections with the set oscillator, as it did while misplaced.

Ballast tube incorrectly placed in socket. An artificial hole had been produced by pressure, into which the key of the tube could fit. Tubes did not light at first on this ac-dc combination, but when they were replaced after testing, they did. An intermittent condition was assumed, which delayed the mechanic quite a bit in discovering the original trouble.

The difficulty in cases like these lies in knowing what to look for. Only an exceptionally keen, very alert eye could have detected a trouble of this sort quickly, especially since the tubes were removed for testing while the set was in its cabinet, with very little light present there.

78 and 75 interchanged. The clue was that contacts 4 and 5 were tied together in the socket occupied by the 75. Since 4 is the diode plate, and 5 is cathode, in the 75, it was apparent that the 75 did not belong there. It was similarly obvious that the 78 did belong in that socket, since 4 and 5 are suppressor grid and cathode, respectively, in this tube.

Incorrect placement of tuning eye tube in socket. No reception was present on this large ac-dc receiver. Noise response was received when the outside aerial lead was placed on the 6Q7 plate, with no response, however, from grid or diode.

The presence of a 100 v positive dc voltage from diode plate of the 6H6 to B— led radioman into extensive, but inconclusive tests of the B+ and control grid circuits. Touching several tubes and finding them cold led him to test filament voltages. None were present on the r-f tubes and the 6Q7, which eventually led to the discovery of the trouble: forcing of the tuning eye tube into the wrong socket holes. A moral might be drawn from this case — never take filament voltages for granted, even when the trouble seems far removed from the filament circuit.

Another caution — in deciding whether or not a wrong tube is being used, never overlook the possibility that the socket has been rewired to accommodate a tube other than the original one.

Tube Manual Errors

Sometimes errors in tube manuals complicate life for the radioman. On one 3-way portable brought in for service, reception was perfect, but 1.4 v tube filaments lit up too brightly.

The set owner was something of a mechanic himself, and was shrewd enough to realize that his tubes would be short-lived if the voltage on the filaments remained excessive.

Questioning brought out that the set owner had recently changed the connections on the 117L7 socket, so that a 117P7 could be used instead. The mechanic checked the substitution with his tube manual—which unfortunately, happened to be the same one used by the set owner—and could find no errors.

No defective tubes, parts, or incorrectly wired circuits appeared to be present. Cathode to B— voltage on the 117P7 was too high, but why? The mechanic decided to try a procedure he very rarely used—a check-up on the plate, screen, and cathode currents.

Milliammeter insertion indicated that cathode current was abnormally high; plate current somewhat higher than normal; and screen current much higher than normal.

This led the radioman to suspect that screen and control grid connections were incorrect (see Fig. 4), a hypothesis verified by the decrease of tube brightness to normal when these connections were reversed.

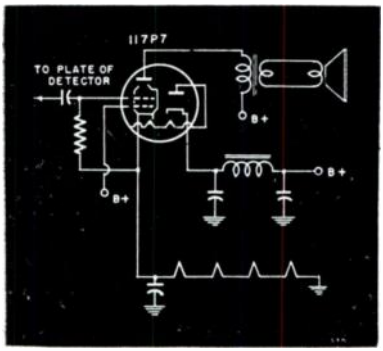


Fig. 4. Reversal of screen and control grid connections brings a highly positive grid close to cathode, increases screen and cathode currents greatly, and thus increases filament voltages of tubes fed by cathode.

The manual had listed these connections incorrectly—a case emphasizing the point that radio servicemen can take nothing for granted.

Value of Memory

Memory is often a valuable tool in servicing messed-up sets. A case may be cited where a 6SH7 had been incorrectly substituted for a 6SG7. Decreased volume resulted.

After working on the set for some time, it occurred to the radioman that he had never seen a 6SH7 used as an rf amplifier. He did remember, however, having seen a 6SG7 in rf sections of similar sets.

On substituting the latter, volume was restored to normal. Missing set model number, and omission of 6SH7 listing in tube manual, made memory the only possible tool here.

THE RADIO TRADING POST

(Continued from page 6)

FOR SALE—Experimental short-wave receiver, 5 bands, 10 tubes, complete with tubes and speaker, $28. V. Kozma, 3104 Wilkinson Ave., New York 61, N. Y.

FOR SALE—Popular music sheets, about 500, late numbers, orchestration for band, the whole lot at $7.50. Joseph M. Kozma, Jr., 3104 Wilkinson Ave., Bronx, New York.

FOR SALE—Webster phono-record changer brand new. Very reasonably priced. Also rim-driven phono motor with 9" turntable. Charles Kotval, 2430 So. 58th Ct., Cicero, Illinois.

WANTED—For cash, phono pickup and turntable, VOM and recording playback, radio unit. State condition, make, price. FOB Denver, Colo. All letters answered. H. W. Patton, A.S. V-12 USNR, 201 McKenna Hall, University of Colorado, Boulder, Colorado.

FOR SALE—Alliance phono motor, 110 v. ac, never used, with turntable, $7.00. New Cornell-Dubilier capacitor analyzer, model BN, with tubes, leads and instructions. Louis Fialkoff, 143-48 41 Ave., Flushing, L. I., N. Y.

WANTED—Tube tester in good condition. State make, model number and price. Must be ac operated and able to test all type tubes present and past. Frank Teicher, 717 E. 175 St., New York 57, N. Y.

FOR SALE—Majestic, Kolster, Philco, Colonial, and Fada radios, chassis and spkrs. Write for particulars. Louis A. Goldstone, 1279 Sheridan Ave., Bronx 56, New York.

WANTED — A Crosley 117 power supply unit, new or used. Harold K. Tryon, Pittsford, Vermont.

WILL SWAP—Plug-in record player, filter, extral pickup. Need tube tester or signal generator or volt ohm meter. Make offer. Leon H. Frantz, 305 Polhemus, San Jose, California.

WANT—Hammarlund Pro., Scott or similar all-wave receiver, age or condition not important. Also Weston 772 or simi lar. Riders Manuals,, courses, dynamic tube tester. Send list. Glenn Watt, Chanute, Kans.

WANTED—SW receiver as Hallicrafters SX9, SX24, S20, or Howard 438, Echophone I, II, III. Will trade against other radios, meters, tubes, and part cash. Sets must be in perfect condition. G. Samkofsky, 527 Bedford Ave., Brooklyn, N. Y.

FOR SALE—Supreme deluxe analyzer 333, $25; Thordardson transformers, choke, 250 power pack, assembled using T-2950 power transformer, $20, with speaker field supply. Clair E. Breth, Sr., 213 South 4th St., Youngwood, Pa.

FOR SALE—Superior channel analyzer, in good shape, one ac volt output meter 1 to 150 v.a.c. Wood Radio Shop, Morrison, Tenn.

WANTED—Complete set of Riders Manuals, Supreme Manuals 1 to 5, signal generator, late model tube tester and Multitester, small cabinets for radio parts, toaster and iron elements. Fred's Radio Service, Box 706, Stryker, Ohio.

WANTED—Test equipment. Write stating what you have, price and condition. Stanley T. Galaski, 223—54th Street, Brooklyn 20, New York.

WANTED—Late model combination tube and set tester. State model and price. Seymour Hammer, 2090 Morris Avenue, Bronx 53, New York.

WANTED—Phono motors and turntables, any type, new or used, any quantity, for cash. Also want amplifiers, arm and crystal pickups, record players, and radio combinations. J. R. Travis, 3831 East 21 Place, Tulsa 4, Oklahoma.

WILL TRADE—50L6's for following: general coverage and band spread coils and instructions for National SW-3, model No. 2.5v, ac;2 12B8, 2 25B8, 3 70L7, 2 47, 3 1A7. Kalashian's Radio Repairs, 2A Congress St., Newburyport, Mass.

BARGAIN—Set of Instructograph tapes in American Morse, never used, 75c apiece. Jay Haley, Mayeton Hotel, Superior, Wis.

FOR SALE—Westinghouse Motor-generator, ac motor, 1/4 hp, 110 v, 3.5 amps., 3450 rpm, dc generator, 350-500 v, .2 amps, .1 kw. Like new, A1 condition, $75.00 cash. Geo. D. Bowers, 604 Scarborough Ave., Rehoboth Beach, Del.

FOR SALE—3000 new tubes at 30% off OPA list. Send for list. Humphreys Music Company, 130 Pine Ave., Long Beach 2, California.

TUBES FOR SALE—I have all types in stock including 1.5 v, 12v, 25, 35, 50, etc. v. tubes. Specify type and quantity desired, include sufficient money to cover postage and handling as well as list price of tube. General Radio Service, 166 North Sierra Bonita, Pasadena 4, California.

FOR SALE—44 type 1A5 GT/G tubes, new in cartons, National Union, 50% off list, or make offer; Universal single button mike and nickeled desk stand with all rubber base and mike springs; Stromberg No. 3-A 2,000 ohm head set. Need phono motors. Wm. M. Fury, 5939 Colgate St., Philadelphia 20, Pennsylvania.

FOR SALE OR TRADE—3 RCA 150 watt transmitters, 30—50 watt tranmtrs. with 5 Weston meters, 2—200 watt, 10—10 watt transmitters. All govt. surplus. Send stamp if photo is desired. Want 1 861 tube or other high power transmitter tubes. Nelson K. Stover, 1357 Hill St., York, Penna.

FOR SALE—Little used Meissner combination FM-AM-SW receiver, 17 tube, mod. 9-1054. $90.00. Harry Spiegel, 8840 Commercial Ave., Chicago 17, Ill.

FOR SALE—Four Millen IF transfs. for FM, three 60503 interstage, one 60504 discriminator, $15 for lot. Meissner 10-1152 high-fidelity broadcast tuner, complete with tubes $30. William L. Smith, 10110 Pierce Drive, Silver Spring Maryland.

FOR SALE—Weston 776 oscillator, 669 VT VM; Dumont 158, 9" oscillograph and tube; Clough-Brengle ODA oscillator, new bats.; Hickok 47X capacitor meter; Carron CCH signal tracers. All perfect. Lewis M. Clark, 105 Second St., Campbellsville, Ky.

WANTED — 15" dynamic speakers, less transformers, 8 ohm voice coils, 5400 ohm field, Jensen or Utah preferred. Must be perfect, top price paid. Hart Radio, 102 Hurd Ave., Findlay, Ohio.

FOR SALE — Precision signal generator, model E-200. Perfect condition, best offer. James E. Bruns, 1226 Wisconsin Ave., N.W., Washington 7, D. C.

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