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CHECKING DEAD RECEIVERS*

Troubleshooting Filament Circuits in A-C / D-C Models

It is generally simpler to service a dead set than one with any other symptoms. In some cases, however, the source of trouble is an unexpected one and not readily located. This is particularly true where we have a dead set in which one or more tubes do not light up. A methodical procedure will save much time in locating such trouble.

If a fuse blows when an a-c/d-c receiver is turned on, a short between both ends of the line is obviously present. On an a-c set, this is often due to a defective power transformer being burned out by being plugged into a d-c power supply. On an a-c/d-c set, a shorted bypass capacitor connected from the plate of the half-wave rectifier to ground is frequently responsible. On both types, a shorted plug or line cord will, of course, blow a fuse.

Speaking of shorted plugs, a nasty burn may be inflicted on the unwary radio service man's hand, if the short is a hot, rather than a cold one—i. e., if a gap present between the two ends of the line is small enough to be jumped by an arcing current when the plug is inserted into the female outlet.

Not infrequently, a filament resistor on an a-c/d-c set becomes shorted to chassis through its casing, causing a fuse to blow. Where the filament resistor is mounted on a bolt, rather than welded to the chassis, the trouble may be due to insulating washers that permit the resistors to short to ground through the bolt.

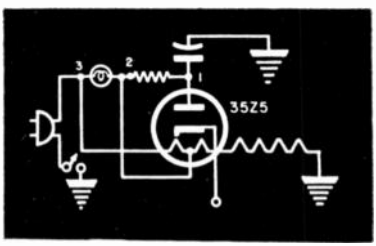

Fig. 1. Checking for line shorts. Tests are made between points 1, 2, 3 and ground, with switch open.

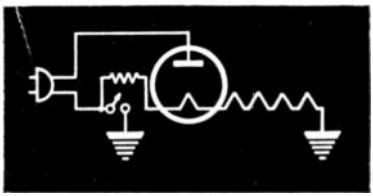

Fig. 2. Reversing plate and negative leads of resistor cord will disconnect filament circuit.

To check for line short, the power supply should be disconnected, and a test made for the lowest resistance reading between ground and various points in the high side of the line circuit; Fig. 1. When the point at which the lowest reading is found, the various components attached to that point should be disconnected one at a time, repeating the ohmmeter test. When the short reading is present, only when a certain unit is connected into the circuit, and absent when it is disconnected, that unit is the guilty one.

If no fuse blows, the tubes should be checked for filament lighting. If no tube lights, the external power supply may be off, due to an open fuse, or the female outlet may be defective. A neon tester lamp, or an a-c voltage test, will quickly detect these troubles.

If the power supply and outlet check okeh, the set's male plug should be inspected. On open-type plugs, the weld joining the prongs to the base often loosens, resulting in a poor contact when the plug is placed into the outlet.

If the male plug appears to be good, one or more tube filaments may be open. If the set is an a-c type, and only

* *By S. Heller in "Service."*

one tube does not light, the trouble is readily apparent. If no tube lights, the power transformer secondary should be tested for filament voltage supply. Then the primary should be checked for 110-120 v a-c.

If any of the present transformer windings read open, and a burnt odor is present in the immediate vicinity of the power transformer, the unit is probably defective, and should be replaced. If no burnt odor can be detected the leads of the winding should be carefully inspected, since power transformers rarely develop open windings merely from long use.

Sometimes a lead becomes nicked and broken by constant wear against the edge of a chassis hole through which it feeds. Cases also occur where twin pairs of leads are present. If the twin leads are not soldered together, the winding may read open, although it is actually perfect.

A similar condition is met when twin lead center-tappings are present. If the twin wires are not soldered together, the winding will be open-circuited.

When the tubes in an a-c/d-c model do not light, tube filaments, plug, line, or resistor cord and switch should be checked in the order listed. On closed-type plugs, pulling on each of the wires at the point where they enter the plug will generally reveal an open, if it exists, the end of the loose wire pulling out. Resistor cords frequently develop an open at the plug, where the fragile resistor wire breaks off from the rectifier plate lead to which it is attached. Since the break is not readily visible, the resistor wire should be carefully unwound until the open is located. Generally only a few windings have to be removed before the break is revealed.

Sometimes tube filaments, resistor cord and switch will test perfect, but the tubes will not light. A reversal of plate and negative leads of the resistor cord should be checked; Fig. 2. The filaments will not light when the resistor cord leads are reversed, since they are connected to only one side of the line, not both.

At times an error of this sort may be encountered on a voltage-doubler power supply. Many are puzzled as to where the negative lead of the resistor

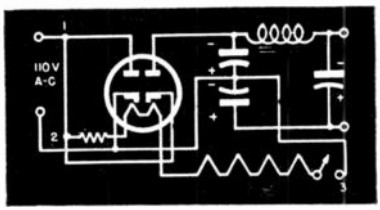

Fig. 3. Proper resistor cord hookup in a voltage-doubler circuit; 1 is a plate lead; 2, a filament resistor; 3, negative lead.

cord goes. Regardless of the circuit, this lead must go to the last tube filament exit point; Fig. 3.

Infrequently, a set will come off the assembly line incorrectly wired. Tracing out the filament hookup will be necessary to find the errors. In one recent case, matters were somewhat complicated by the owner's report that an a-c/d-c midget had been playing until recently. Inspection showed that the 50L6 had been wired so that the leads that should have gone to prong 1 went to prong 2 and those that should have gone to 2 went to 3, etc. The filament circuit was thus open, and the set couldn't possibly play. In spite of this, the lady swore on her honor that the set had been performing perfectly before it went bad!

A shorted tube on an a-c/d-c set may cut off filament current from several other tubes. Let us suppose that the shorted tube, and the tubes deprived of filament voltage are metal types, whereas the lighted ones are glass; Fig. 4. The lighted glass tubes often mislead, suggesting that the filament circuit is okeh. Thus long, useless tests of plate, screen, grid, and other circuits are made, since the filaments are generally the very last to be suspected and tested. To avoid such a time-wasting procedure, low-voltage metal tubes should be felt for heat as a rough, quick check on the presence of filament voltage.

When metal tubes feel warm and the glass tubes in an a-c/d-c set don't light up or when glass tubes light up and metal tubes feel cold, a shorted

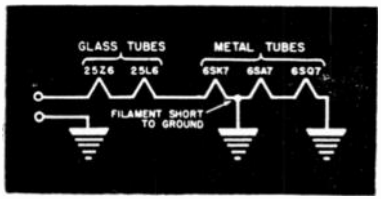

Fig. 4. Short from arrow point to ground will prevent filament current flow to the metal 6SA7 and 6SQ7 tubes. The glass tubes will remain lighted in this case, and the filament circuit will therefore not be suspected.

tube is probably present. In the latter case, it should be noted that the glass tubes usually light far more brightly than usual.

When high-voltage tubes, such as the 50L6, develop shorts between their filaments and other tube elements, the cathode resistor of the tube generally smokes, due to the excessive plate current. This clue should lead to quick detection of the trouble. It may be difficult to locate this type of defect quickly, when the short is of the hot type, and does not show up in the tube tester. Substitution of another tube, and observing whether the cathode resistor still overheats, constitutes the best test in these cases.

Series-connected tubes in a-c/d-c sets sometimes may not light because one of them may have been incorrectly forced into its socket. If the tubes are not withdrawn for testing, this type of trouble may not be obvious. Even when they are withdrawn and checked, they may be incorrectly re-inserted because . . . the key hole in the socket has been enlarged or the tubes have been replaced while the chassis is in the cabinet with insufficient light to guide during the operation. An ever-present alertness is the only guard against the time-wasting tests that result when this happens.

Tubes may have been incorrectly inserted into their sockets because their key sections have been broken off.

Filaments may not light because the tubes are in the wrong sockets. This generally occurs only when a detector tube like the 6SQ7, with filament prongs located at 7 and 8, has been interchanged with a tube whose filaments are the more usual 2 and 7. Since the detector tube socket will have filament connections leading from the other tubes to contact 7 and 8, the trouble may be readily located and corrected.

Defective grounds may prevent a set from lighting. On some old t-r-f models, the last tube in a series-connected filament string returns to ground through a weld-joining socket to chassis. If the weld becomes rusty, the contact may become open circuited.

The most frequent cause of intermittent lighting is a defective plug. When an enclosed, rubber plug is suspected, it should be moved around in the outlet to note if the tubes light intermittently. The line cord should be checked next, by moving one section about, while holding the other section still.

To illustrate this test, suppose we choose a point, say, 10″ from the plug on the line cord, and call this point X. The cord should be held at point X firmly, so that the 10″ section of wire between X and the plug does not move. The rest of the wire should be shaken. If the tube filaments continue going on and off, the section between X and the plug has been eliminated as the source of trouble, and a new point, Y, to say 20″ from the plug's end, may be chosen, with similar tests made, until the troublesome section of wire is located.

One might ask why we should go to such extremes to locate the exact point of the trouble, when the line cord may be quickly and cheaply replaced. Well, not until we are sure of exactly where the defect lies, can we be cer-

(Continued on page 15)

A Free Market-Place for Buyers, Sellers, and Swappers.

These advertisements are listed FREE of charge to C-D readers so if there is anything you would like to buy or sell, if you wish to obtain a position or if you have a position to offer to C-D readers, just send in your ad.

These columns are open only to those who have a legitimate, WANTED, SELL or SWAP proposition to offer. The Cornell-Dubilier Electric Corp. reserves the right to edit advertisements submitted and to refuse to run any which may be considered unsuitable. We shall endeavor to restrict the ads to legitimate offers but cannot assume any responsibility for the transaction involved.

Please limit your ad to a maximum of 40 words, including name and address. Advertisements will be run as promptly as space limitations permit.

FOR SALE—GE meter rectifiers, $1. Wabash infra red lamps, 250 watts, 3 for $1. 3 watt Argon lamps, 3 for $1. 7½ watt GE 110 volt medium Edison base lamps, 120 for $8, frosted. Other bargains in photo, radio and refrigeration parts. Send stamp for list. Sivec Electric Co., 284 Loomis St., Little Falls, New York.

FOR SALE—Trimm cable and 2X4 control box with selector knob and volume control, for individual hearing or together with radio speaker. Head phones included. Never used. Make offer. Also have selection of speakers. Send for list. Harold Brown, Pen Argyl, Pa.

FOR SALE—Phonograph motors with 9" turntables, 110 volt ac 60 cycle, rim drive, shock mounted, 78 rpm fan, $4.25 each. With latest style Astatic curved 1 oz. crystal pick-up arm add $1.30. Act now, limited supply. Arms not sold separate. L. Greene, Jr., 9 Eliot St., Watertown, Mass.

WILL SWAP—RCA Station allocator, No. 171, good as new, for a good signal generator, and would consider other equipment. Moore Radio Shop, Box 203, Allen, Okla.

WANTED—Small transmitter for 10 meters. Have 1 tube battery set, Radio Physics Course, back issues Radio Craft and Radio News magazines. Holtstein, 246 E. 148 St., Bronx, N. Y.

FOR SALE—Used radio receiving and transmitting equipment for sale. Write for list. Edward G. Kertz, 5143 10th Ave., Kenosha, Wis.

FOR SALE—Converted Signal Corp. W.E. B-C 5" oscilloscope complete with controls, sweep circuit, etc. Need Prescision 900 tube tester, Solar CB 1-60 capacity analyzer or equivalent. G. H. White, 449 Wellington Rd., Mineola, Long Island, N. Y.

WANTED—Riders volumes 8, 11, 12 and 13. Also need complete set of test leads for Rider chanalyst. Have fifty new tubes for trade—regulators, UHF-Acorn, phototube and special purpose. Ideal Radio Service, P. O. Box 192, Empire, Ohio.

WANTED — Photographic enlarger complete with lens and adjustable diaphragm. Also want late model exposure meter in good working condition. State brand, model and condition. Dexter Kurs, 4525 45 St., Long Island City 4, New York.

FOR SALE—One 542 Supreme 5000 ohm multimeter, $15. One Supreme 189 signal generator, $25. One Superior channel analyzer, $25. All in perfect condition. J. F. Ries, 1521 S. Kent St., Arlington, Virginia.

WANTED—Chassis for Silvertone, model 100,198, less speaker, less tubes. Need not be in running order as long as it can be repaired. F. M. Rosenberg, 19 Rear Pearl Ave., Oil City, Pa.

SWAP—Will trade $250 worth of new radio parts for one SX-28A receiver in good condition. Have meters, power transformers, filter chokes, condensers, transmitting tubes, all new. Radio Communication Service, 4475 Myrtle St., San Diego 5, Calif.

WANTED—Army transceiver, model SCR:-536, 245, 193, in any condition. State your own price. Any amount. Victor Kozma, 3104 Wilkinson Ave., Bronx 61, New York.

SELL OR SWAP—Kodak K-20 camera with filters, $250. Need excellent communications receiver or plate load camera. J. J. Logan, Jr., 542 Gravilla Pl., La Jolla, Calif.

WANTED—Any type of test equipment, new or old, or old types for modernization. I have about 24 Type 20 and 30 tubes, used, but filament tested, which can be had upon receipt of $1 plus postage. Also have a Jefferson tube rejuvenator. Andy R. Harcar, R. D. No. 2, Birdsboro, Pa.

SELL OR TRADE—Rauland BC-223A 25 watt transmitter for 75-80 meters, crystal and E.C.O. complete, ready to operate with ac supply, $75. Also have books, courses, multimeter and many other radio parts. Send for list. K. H. Stello, P. O. Box 1298, Hollywood 28, California.

FOR SALE—Precision model E-200 signal generator designed for servicing by signal substitution. It is the latest model and is new and in the original carton. Milton Maultasch, 535 Grand St., Brooklyn 11, N. Y.

FOR SALE—To all hams sending QSL card and $1 complete information on construction of antennae that really gets out on 20 and 10 meters. Need ham equipment and stuff along that line. Have plenty of receiving tubes and supplies for disposal. Eddie Howell, Rte. 2, Dillon, S. C.

FOR SALE—Radio Technician Course by Capital Radio Engineering Institute, contains 41 individual lessons in book form including a master answer book for the first 21 lessons, brand new, $14. Victor Kozma, 3104 Wilkinson Ave., New York 61, N. Y.

FOR SALE—Have new outfit for making glass signs. Hot water car heater. Folding camp stove. Eastman folding 3A binoculars. Hair clippers. Want volt-ohmeter, shortwave set, age, model or condition not important. Glenn Watt, Chanute, Kans.

WILL TRADE—Astatic pickup arms with L72, L70, L40 or L26 cartridge for modern portable typewriter. All letters answered. F. Lewis, 548 Brompton, Chicago 13, Ill.

FOR SALE—Amateur communications receiver, RCA, model ACR-136 in good physical condition. Very reasonable or will trade for other gear. What have you? George Kershenbaum, 1100 Albany Ave., Hartford, Conn.

FOR SALE—955 tube sockets, 29 cents each. Bud coils, RCL-80, $2.25; OCL-40, 95 cents; OCL-20, 95 cents. Hallicrafter S-20-R $60. Supreme model 85 tube tester with 3 octal tube adaptors, $20. Heights Radio, 40 Hick St., Brooklyn 2, New York.

FOR SALE OR TRADE—Popular Aviation magazines, complete from July, 1933 through June, 1937 in ring binders, six issues to a binder. Will trade for radio manuals or test equipment. Edward Benn, 1360 N.W. 42 St., Miami 37, Fla.

WANTED—Any Riders manual. Any one or all. Will trade hard-to-get tubes or BC-375E 100W xmitter with all its units, new. Also Skybuddy. Joe's Radio, 2224 W. Belden Ave., Chicago 47, Ill.

FOR SALE—RCA record player, model A6, for use on 105-125 volts, 60 cycles, and includes pickup arm and crystal, motor and turntable and volume control, all housed in a brown bakelite cabinet. Price $12. Milton Maultasch, 535 Grand St., Brooklyn 11, N. Y.

FOR SALE—Neon tube transformer, primary 110v, 60 cycle, secondary 7500v, $5. German 6x24 binoculars like new, $30. Montgomery-Ward auto heater, large size, late model, $8. First money order gets them. Albert C. Hart, 4848 Linden Ave., Hammond, Ind.

WANTED—Aerovox 95LC checker. Gregorka Radio Service, 630 E. Main St., Little Falls, N. Y.

FOR SALE OR SWAP—Wireless sets No. 19 Mark II Zenith, complete transmitter and receiving sets, never used, 3 sets in one. For complete description, write to J. Acampa, 1655 76th St., Brooklyn 14, New York.

FOR SALE OR SWAP—O-150 micro ammeter, O-300 milliammeter, combination meter, O-1 milliampere, O-500 millivolt. All top quality, new. Other radio parts at bargain prices. Jim Pierce, 402 Mulberry St., Elizabethtown, Ky.

SWAP—One new set of Supreme Publication of most often needed radio diagrams from 1926 to 1942. Will swap for a Precision signal generator, E200 and pay the difference or buy same. Warren H. Perkins, Cincinnatus, N. Y.

WANTED—Tube tester, signal generator and capacity tester. State condition, model, etc. Will buy or swap. J. Bazewick, 3000 N. Christiana, Chicago 18, Ill.

FOR SALE—Complete Sprayberry Course in radio service, including television. 3 years old and in perfect condition. Best offer takes it. Saber Radio, 194 Summer St., Lynn, Mass.

(Continued on page 12)

RECEIVER INPUT CIRCUITS*

(Continued from last issue)

Coupling Coil Link

In Fig. 5 we have Firestone model S-7400-1 which uses a removable loop fitted with a plug and a high-impedance antenna coupling coil. High-impedance primaries are better than

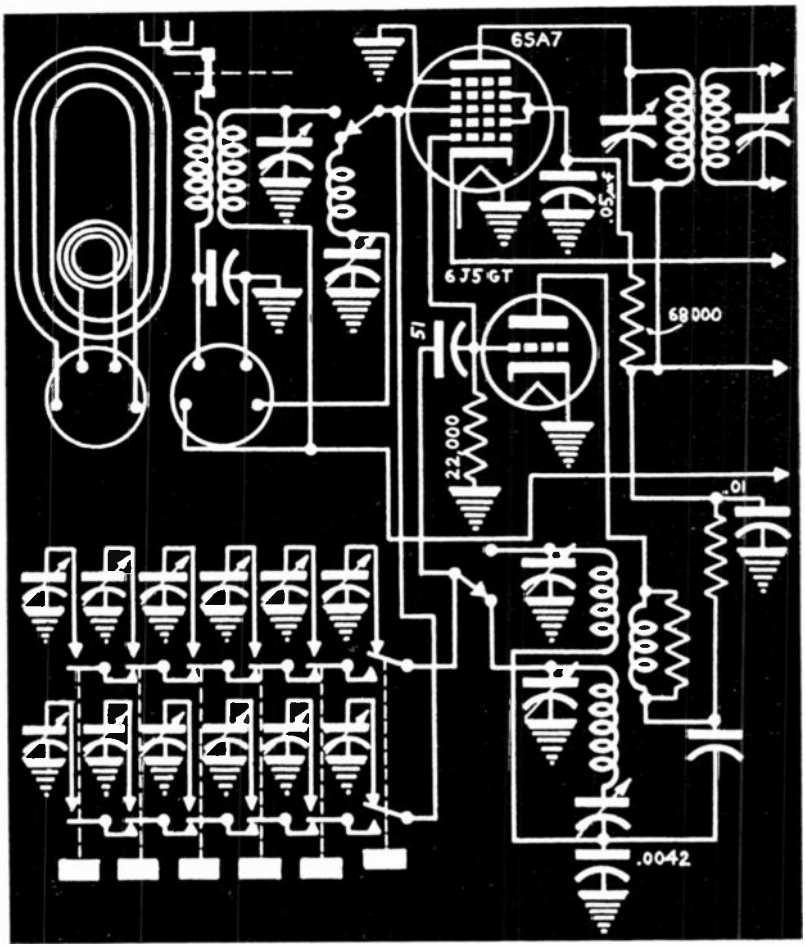

Fig. 5. Loop antenna system used in the Firestone S-7400-1. A high-impedance primary is used with the loop to provide uniform frequency response.

* *By L. E. Edwards in "Service."*

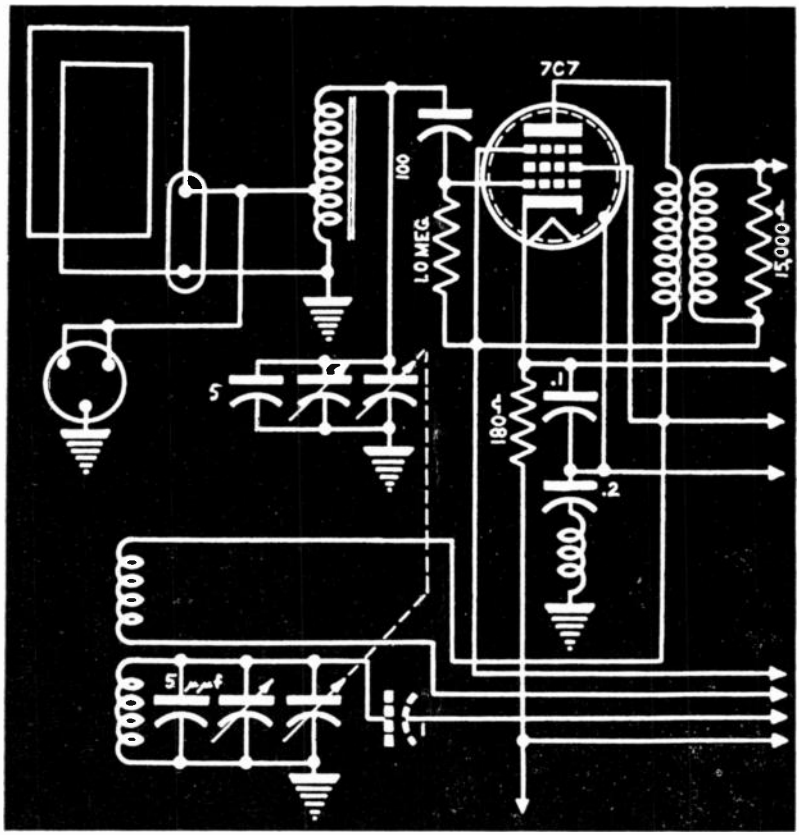

Fig. 6. Loop circuit of the Philco 42-1004. The loop is a low-impedance type, and is coupled to the r-f tube through an autotransformer type antenna coil.

single-turn primaries, providing more uniform coupling with varying frequency. However the expense is often too high for small sets. Many receivers using high-impedance coils have a shorting link to short circuit the primary when the external antenna is not used. This prevents absorption from the loop at resonant points of the primary coil within the broadcast band.

The loop plug is a good feature. It provides better calibration stability since placing of the leads does not affect the tuning.

This Firestone model is a 2-band unit with a plate antenna on the rear of the cabinet for short-waves. A loop loading coil is also used. A 110-mmfd high-frequency bypass capacitor across the antenna primary prevents the primary from acting as a r-f choke on short-waves, permitting however most of the broadcast signal to get through. This eliminates switching. The external antenna feeds the loop primary through a short-wave transformer, but the inductance of this primary is so

low that it doesn't attenuate broadcast frequencies.

Philco Low-Impedance Loop

An unusual loop circuit is used by Philco in some of their receivers, as in Fig. 6, model 42-1004. Here we have a low-impedance loop which is coupled to the r-f amplifier by means of an antenna transformer. Actually this transformer is an extremely critical, very high-Q autotransformer which provides for very close coupling between the tapped lower section (primary) and the remainder of the coil. The loop itself has only a few turns and is insensitive to capacity effects and calibration changes. Both the Q and the response change little within the broadcast band. The external antenna is connected through a plug to the same tap as the loop. This low-impedance loop system lends itself readily to band-switching by means of taps on the coupling transformer.

The loop circuit is isolated from the input grid by a 100-mmfd blocking capacitor, the grid circuit being com-

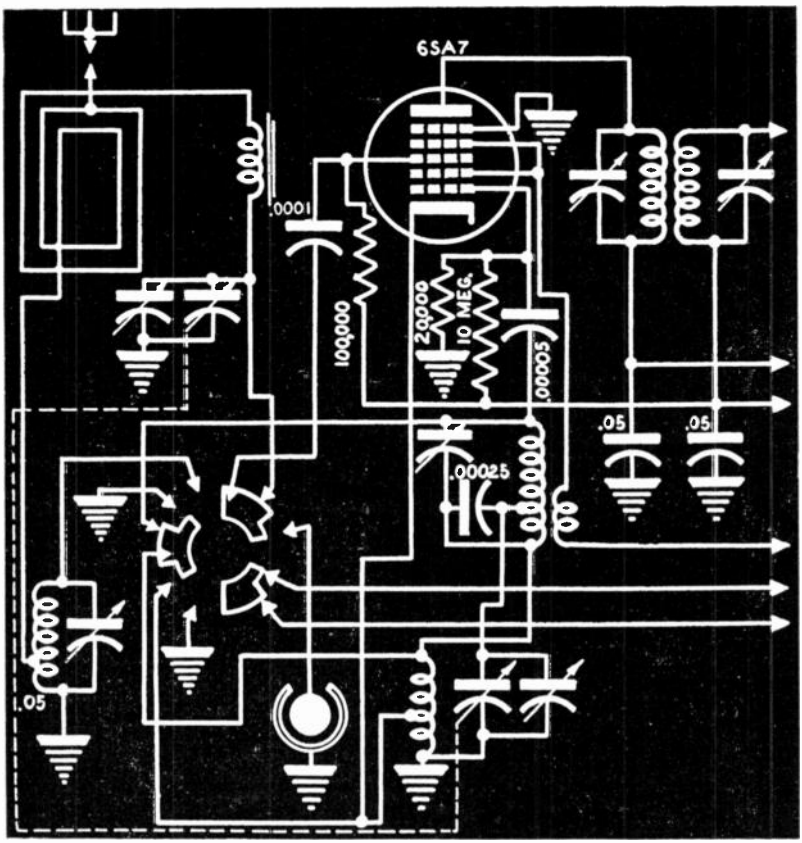

Fig. 7. Two-band loop used in the Continental C7. External antenna requires no additional switching, because of the autotransformer-type coupling arrangement.

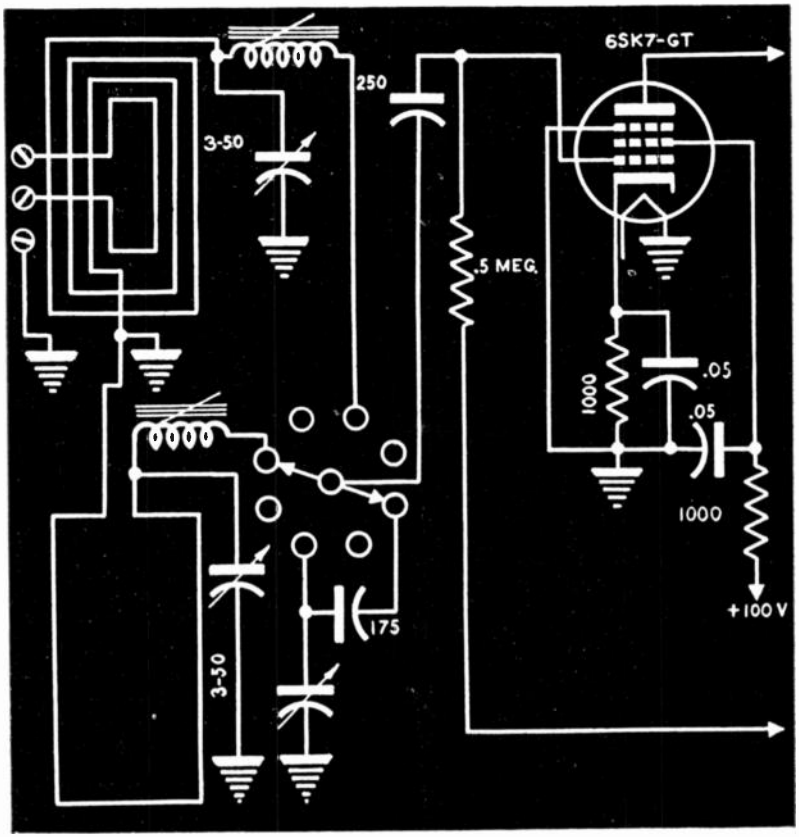

Fig. 8. Loop system of the Scott Laureate. Two loops are used, one for each band. Loading coils are inserted in series with the loops to provide uniform frequency response.

pleted by a 1-megohm resistor to the avc bus. This receiver uses an untuned r-f transformer for coupling between r-f amplifier and first detector. A 15,000-ohm secondary loading resistor is used to broaden the response sufficiently to cover the entire broadcast band.

It is interesting to note that low-impedance loops are being used in most all modern radio compasses, direction finders and loop homing devices aboard aircraft. The loop is coupled to the receiver through a low-impedance transmission line which is free of capacity loading and other capacity effects and may be of any length without affecting the tuning of the receiver. This is not the case with conventional high-impedance loops.

Continental Radio Coupling System

An ingenious coupling arrangement for broadcast and short-wave bands is used in the circuit of Fig. 7 (Continental Radio & Television Corp., model C 7). A tapped loop, tapped short-wave antenna transformer and an

iron-core loop-loading coil are used. The loop circuit runs from chassis through a few turns of the short-wave transformer, through the loop and loading coil to a 6SA7 grid. The external antenna is coupled to the loop by direct connection to a low-impedance tap (near the low potential end). On short-waves the loop acts as a capacity antenna connected to a low-impedance tap on the autotransformer. If the external antenna is added, so much the better, but no change in circuit is required. The loading coil acts as a r-f choke on short-waves, preventing shunting of the signals to ground through the tuning condenser which is not used on this band. Again, an isolating capacitor of 100-mmfd is used, but the grid leak is of a lower value, 100,000 ohms.

Two-Band Input System

Fig. 8 shows the antennas used in the 2-band a-m section of the Laureate model of the E. H. Scott Radio Labs. There are two separated high Q loops, one for each band, and each loop has a loading coil. Note that the trimmers for both loop circuits are located on the low (loop) side of the loading coils rather than at the grid input, the point of highest impedance. The external antenna is coupled by the single-turn method to the large loop and by stray coupling to the short-wave loop. The latter consists of a single large turn rather than a number of smaller turns. This arrangement gives greater pickup.

The tuning range of the short-wave band is reduced by the insertion of a 175-mmfd fixed capacitor in series with the tuning condenser. Another 250-mmfd capacitor isolates the loops from the r-f amplifier grid. This amplifier uses a 1,000-ohm cathode bias resistor to supplement the avc bias.

Tapped Low-Impedance Loop

The input circuit of the Philco models 42-853, 42-854, use a tapped low-impedance loop, the tap being used for antenna coupling for a large external antenna and also for short-wave loop performance. On broadcast, the loop feeds in iron core, very high Q autotransformer exactly as in Fig. 6, except for the low-impedance tap which permits a better match with a long- or high-capacity antenna. This is connected to the center binding post on the antenna strip.

Triodes as Converters

The right hand post is connected to the outside of the loop and is for a short or low-capacity antenna, as in Fig. 6. On short-waves, the loop tap is connected to the chassis and the outside is connected across a simple coil, the net inductance being correct for proper ganging. In this receiver, the oscillator voltage is fed to the converter by a very small grid-to-grid capacitor on the bandswitch. Whereas most manufacturers use the conventional multi-grid converter tubes, Philco often uses triodes for converter functions. This requires an additional triode for the local oscillator.

Dual Loop Input

A dual-loop, 2 band design with novel external antenna coupling and a simple bandswitching method is featured in the G.E. model L-642. Here the antenna is coupled to the broadcast loop by means of the usual single turn primary and a 680-ohm series resistor which has two separate functions; flattening of the frequency/coupling curve and as a substitute for a r-f choke to prevent shunting of the short-wave signals through the loop primary to ground. On the other hand, a small capacitor, 39 mmfd, is used as a series condenser to couple the external antenna to a short-wave loop at a low-impedance tap. This capacitor also reduces the shunting effect of broadcast frequency signals. The short-wave loop has a second tap for the tuning condenser providing band-spread action, in conjunction with a 250-mmfd series capacitor.

Bandswitching is accomplished by a double-pole, double-throw switch. In this receiver the short-wave loop is placed horizontally on top of the cabinet while the broadcast loop is in a vertical plane below. A fixed-tune r-f transformer is used between the 12B7 r-f amplifier and 12SA7 converter which also contains an i-f wavetrap.

THE RADIO TRADING POST

(Continued from page 6)

FOR SALE—New 1947 table model super radio with 5 tubes and loop antenna. Net $21 each. Deduct 10% in lots of 6. Cash with order. No C.O.D. Satisfaction assured. Fast seller and good performance. Radio Mart, Sheridan, Pa.

FOR SALE—78 rpm single speed electric phono motors, phono pickups, several different type tubes, many hard-to-get numbers. Many other parts. Write your needs. V. J. Balcar, 380 S. Alice Ave., Austin, Tex.

FOR SALE—6L6 single tube, 80, 40, 20 meter code transmitter. RCA crystal, home made coils (80 meters only), built in power supply, rectifier tube (5Y3), rack and panel construction. All of the above for the highest offer above $20. Fred Smith, Rt. 2, Box 490, Royal Oak, Michigan.

WANTED—Urgently need first seven issues of QST to complete files prior July, 1916. Will pay many times original cost or swap equipment. Boyd Phelps, 4232 Scott Ter., Minneapolis 16, Minn.

FOR SALE—Peanut tubes 1S5 and 1T4, brand new, never used, but not in original cartons. Also 4 peanut tube sockets. $2 takes all. W. J. Ryan, Jr., 1053 Bryant Ave., Bronx 59, N. Y.

FOR SALE—Business plans manual, illustrated. Practical plans for securing additional income. 127 plans, $3 cash or money order. Sherman Goldman, 26881 Minock Cir., Detroit 23, Mich.

TRADE—Portable push-button tube tester, home made all-wave signal generator, Supreme multimeter with ac volts and capacitance sections; for 5 to 10 watt amp. with speaker, plus cash or what have you? Concord Radio Service, 60 School St., Concord, N. H.

FOR SALE OR TRADE—New tubes in sealed cartons. 40% off list. Send for complete list. Need Riders manuals. Lucien Michaud, 275 Bates St., New Bedford, Mass.

FOR SALE—Highest cash offer takes U. S. Signal Corps motor generator, 6- or 12-v input, 500V-160 M. A. output. Brand new in original case, F.O.B. Broadway Radio and Electric Service, 693 N. Broadway, E. Providence, R. I.

FOR TRADE—2 new pin up and 2 used screw-in fluorescent shop lights, complete, plastic diffusers, for a good automatic record changer, less amplifier, or what have you? A. Penquite, Jr., 511, S. Fifth, Marshalltown, Iowa.

WANTED—Any make of plugin and cable analyzer. Also Jumbo V.O.M. Have cash and new Hickok 203 for trade. Ed. Sujak, 5321 W. 30th Place, Cicero 50, Ill.

FOR SALE—Ham receiver "Bretiny 12" in perfect condition, 14 tubes 5 bands, contains modulator and power supply for 35w output, R meter and volume meter. First offer over $60 steals it. R. J. Foster, 48 Eliot Rd., Arlington, Mass.

FOR SALE OR TRADE—Hallicrafter S-20-R in excellent condition, little used, $50. 1 Western Electric P.A. system on 5' rack, amplifiers 41-A, 42-A, 43-A. Make offer. A. H. Dreesen, Mansfield Centre, Connecticut.

FOR SALE—Supreme 571 signal generator, new like condition, $40. SG60 signal generator, new, $35. Giant 8" Marion multimeter dc volts, M.A. and ohms, $25. Cash with order. Will ship prepaid. Alfred Werhan, 103 Wesley St., Manlius, N. Y.

WANTED—First class radio serviceman, take charge of service department, Southern Radio Service, Thomasville, Georgia.

TRADE—Your name and address on a 3 line, cushion-mounted, index face rubber stamp, made to order for 30 cents and 2 radio magazines. Magazines must be in good condition. J. T. Cookson, Box 0, Puxico, Mo.

FOR SALE—70 random copies of Electronics, QST, Radio, FM, Radio News, etc., dating from 1936 to 1944. All perfect, all different, all for $6, plus postage, or C.O.D. Philip Ross, 280 Wadsworth Ave., New York 33, N. Y.

WANTED—18" Jensen or Cinaudagraph speaker, PM or field type. Also Rider's volume 13. Have Turner BX Xtal mike, 30 watt output transformers for PP par. 2A3's, Utah and Garrard automatic record changers, 6 volt radio Zenith model 6V27. Eiler's Radio Service, Box 204, Gladbrook, Iowa.

POSITION WANTED — Ex-Navy Chief Radiotechnician, 10 years experience, first class telephone and 2nd Class telegraph licenses, graduate of Navy technician school. Would like lab work or in broadcasting. FM or short-wave work. Teaching experience. Charles Higginbotham, Penngrove, Calif.

FOR SALE—Hard-to-get tubes, 10% to 30% off list. Send for catalog of parts and radios. Commercial Radio, 36 Brattle St., Boston 8, Mass.

FOR SALE—One Meissner Xtal filter, 9-1042; 1 Meissner, 16-6123, 16-6643 and 16-6139. Want 2 Meissner IF 17-7416. Louis Bauernfeind, Box 125, Hortonville, Wisconsin.

FOR SALE—Two Westinghouse rectigon battery chargers, guaranteed A1 shape. Operate on 110 volt ac 60 cycles and put out 6-8v at 2 amperes dc. Also 2 Radio City Products tube and set testers models 801M and 803. All for sale or trade for what have you? Boyd Branch, 1732 1st St. N.W., Washington, D. C.

WILL SELL OR TRADE—Used Motorola auto radio, No. K21158 for multitester or signal generator. Charles Tucci, 47-11 98th St., Corona, N. Y.

FOR SALE OR SWAP—Masco 50 watt amp. new; Webster 6v amp.; new RCA mike; Bruno mike; Gray Keyer with 10 rolls of code tape; Acme 35mm projector with 1000 watt lamp; Federal enlarger. Want SX28A receiver or Super Pro Hickok Traceometer, RCA chanalyst or good communications transmitter or what have you? Gerald Hess, 15 Park St., Moravia, N. Y.

FOR SALE—First $20 will get this bargain. Novelties manufacturing course and electrician course. Worth much more. M. Navas, 69 Bank St., New York, N. Y.

FOR SALE—Hickok model 650 test panel, 18" square. Tests acv, acma, dcv, dcma, ohms, capacities. Ohms and capacity have ac power supply. Has two 5" illuminated Hickok meters, $30. Triplett ac voltmeter, model 673 and ohmmeter, model 678, $5 each. Ernest Kumfert, 21 Walker St., New London, Conn.

FOR SALE—300 watt phone CW transmitter. Push pull 35T's driven by 35T. Pair HY30Z's, class B modulator, built in metal cabinet, has 3 Triplett meters for checking grid or plate current of each stage. Coils for 10 to 60 meters. More information on request. Make offer. Max Shively, 3115 Ingham Rd., Lansing 10, Michigan.

FOR SALE—Army communications equipment. One radio compass recur. unit, ARN-7, complete with 15 tubes, $32. One rectifier unit, 400 cycles, 2 transformers, 10 condensers, 4-5R4's, complete for $13. Richard Harrison, Box 541, Georgia Tech, Atlanta, Ga.

FOR SALE—Tubes, five 1A7, five 35Z5, two 50L6, ten 12SK7, at 20% off price list. Spada Enterprises, 10 Lexington St., Wethersfield 9, Conn.

WANTED—RCA Service Notes for 1936, 1937, 1939, 1941. Also Practical Testing Systems by John F. Rider. State condition and price. John R. Morrison, Box 4264, Oklahoma City 9, Okla.

FOR SALE—AC auto battery-substitute power supply, 7 volts, 7 amps, dc, complete kit, $10.50. Tube specials, 2C40, GE, RCA, $4.80; 5JP1, 5JP4, Dumont, $9.75; 1846 Iconoscope RCA, $65. Also have other parts Send for list. Eleskay Corp., Electronics Div., 2503-07 No. Broad St., Philadelphia 32, Pa.

WANTED—Hickok model RFI-5 oscilloscope. Also Clough-Brengle model 127 oscilloscope. For Sale, Clough-Brengle frequency modulator, $25; 1/6 hp ac motors, $14 and $16. Paul Capito, 637 W. 21 St., Erie, Pa.

FOR SALE—Transcriptions, broadcast type, 16" dia. play 15 minutes at 331/3 RPM. Double sided, with music and drama. Flexible type, used slightly. FOB Chicago, 2 for $1 or 5 for $2. Paul H. Prokes, 9216 S. Menard Ave., Oak Lawn, Illinois.

FOR SALE—Radio tubes at 20% off list. 1946 radios, 5 tubes ac-dc, $25. Prompt attention to all orders. Send us your wants in tubes, parts or sets. We will fill orders to best of our ability and return the same day. Academy Radio, 1901 Mott Ave., Far Rockaway, N. Y.

WANTED TO BUY—Triumph model 130, Weston 776 signal generators. Write to James Howard Jones, 1606 Asheboro St, Greensboro, N. C.

FOR SALE—Radio course with answers in beautiful loose leaf binders, 2 volumes, and other instructive radio books. A bargain. First money order for $25. takes all. No checks. M. Rey Bonneville, 1725 Brown Ave., Norfolk 4, Va.

FOR SALE—Slide Rule Short Cuts, with positive location of the decimal point, for radio engineers and technicians. Second edition, just off the press, $1.50 postpaid. W. P. Miller, 536 F St., San Diego 1, Calif.

TRADE—8mm movie projector, 250 watt electrically driven with 30x40 screen, worth about $15, for VOM in good condition. Smith Radio Shop, 70 W. MacArthur Cr., S. Portland, Me.

FOR SALE—First $500 gets my complete stock of tubes, testers, tools, everything. Write for complete inventory. Boley's Radio Service, Winfield, Ala.

FOR SALE—Clough-Brengle model 230 ac capacity, resistance and turns ratio bridge. Good condition. Price $40 cash. W. C. Engel, 430 N. Bancroft, Indianapolis 1, Ind.

WANTED—Used communications receiver and two speed G.I. recording unit. State condition and price desired. Walter Tyminski, 125 Cottage St., Jersey City 6, N. J.

FOR SALE—Radio City Products pocket multimeter model 448, 5000 ohms-v., with leads. New, never used. $22 to first money order, postpaid. Robert J. Cartwright, 69 Mountford St., Boston 15, Mass.

FOR SALE—If you are in need of hard-to-get tubes, let us know. We will be glad to serve you. Customers served from coast to coast daily. We carry the following guarantee: "Customers must be satisfied or money will be cheerfully refunded." Snyder's Radio Service, Pitman, Pa.

FOR SALE—Send for list of new and used sound systems, amplifiers, musical amplifiers. Enclose stamp. David A. Bensman, 1334 Marie Court, Sheboygan, Wisconsin.

WANTED—Photographic enlarger and all dark room equipment. Have complete sets of Pan-Ortho filters, 42mm and 36mm, 6x30 binoculars, telescope, electric shaver, radio books and magazines, or will pay cash. Charles Morehead, Box 22, Flat Lick, Ky.

FOR SALE—Scott all-wave superhet, 12 tubes, chassis, separate power pack, 12" speaker by Scott. Fine playing condition. Beautiful chrome finish. Make offer. Harold Brown, 520 Pen Argyl St., Pen Argyl, Pa.

FOR SALE—Price card outfit, including several thousand cards in a partitioned 4 drawer oak cabinet. Suitable for radio or gift store. Price, $15 plus shipping. Original cost was $100. For appointment, write G. Samkofsky, 527 Bedford Ave., Brooklyn, N. Y.

WANTED—Up-to-date tube tester, Superior tube and set tester, and oscillator in first class condition only. J. B. Mosley, Austell, Ga.

WANTED—Aerovox LC checker for checking coils and capacitors. Also want CRO 5BP4 tubes. L. W. Thomsen, 81 Pine Hill Ave., Stamford, Conn.

FOR SALE—Airborne transmitter BC-375, sealed in original cartons. Transmitter, seven tuners, one dynamotor, one antenna tuner. 28 or 24v, easily converted to 110v. Ready for use, output 120 watts, phone or C.W. With tubes and instruction book, $115. Worth many times more. For information write Daniel J. Atkinson, 124 Chester Pike, Norwood, Pa.

FOR SALE—Univex P-500 8mm projector, in perfect shape, with extra 500 watt projection lamp. A bargain at $50. Frank W. Jones, Gabbs, Nevada.

FOR SALE—Used test equipment, parts, and receivers. Send stamp for list. Milo G. Burston, 808 River St., Alpena, Mich.

FOR SALE—Latest type G.E. CRO-3A oscilloscope. Also one Weston 787 UHF oscillator. Write Radio Laboratory, 706 N. Washington Ave., Scranton, Pa.

FOR SALE OR EXCHANGE—Atwater Kent 12 tube and a Philco table model 5 tube radios. Both in splendid condition. Table model radio in exchange preferred. Bernard Dalton, 117 Colony St., Bridgeport 8, Connecticut.

WANTED—R.F. signal generator and mutual conductance tube tester. Have Kenyon 2500 volt scope transformer, $10. Also photo and chemical equipment cheap. Virgil Johannes, 1541 Metropolitan Ave. 3E., New York 62, N. Y.

FOR SALE—One Vomax meter, one Solar QCA analyzer. New condition, used very little. First $60 takes it. G & F Radio Shop, Homestead Ave., Maybrook, New York.

WANTED—Any or all Rider manuals from 8 to 14. State condition and cash price. H. W. Schendel, 518 W. Main St., Sparta, Wis.

FOR SALE—2 factory made cabinets for Meissner 6 tube ac-dc radios No. 10-1199 kit. $4. each, F.O.B. Scobey, Montana. Don Leibrand Radio Service, Scobey, Montana.

SWAP—1945 N.R.I. radio course. Want photographic equipment. All offers considered. Denver F. Motfert, 2125 Goff Ave., Clarksburg, W. Va.

FOR SALE—2 Philco home recording kits; 1 Philco remote control; Philco dynamic tester, model 30; RCA tube tester, model 156; Thor electric and gas ironer, model 175. All for $200. Kubicek, 20 Warburton Ave., Yonkers 2, N. Y.

FOR SALE — Clough-Brengle model 110 signal generator, and model 111 Electronic frequency modulator. Hardly used, in excellent condition. Will sell or swap for best offer. Need VTVM and tube tester. C. R. Maduell, Jr., Box 476, New Orleans 1, La.

WANTED—Superior utility tester, 1941 model with test leads and instructions. In reply state condition and cash price. C. L. Warner, 105 N. Keesey St., York, Pennsylvania.

FOR SALE—One new ac-dc multitester, 1000 ohms per volt using 4" square type meter. Will ship express prepaid for $15.50. Jack Goldstein, 151-09 34th Ave., Flushing, Long Island, N. Y.

WANTED—Composit broadcast oscillator, first IF transformer 456 for Emerson radio, K116. Please state price. National Radio Service, 102 Bloomfield St., Hoboken, N. J.

FOR SALE—Glo-Point soldering irons, 600 watt capacity, heat from 6 or 12 volt source. Fully guaranteed. Price $3.50 each. J. H. Geddes, 48-54 207th St., Bayside, N. Y.

WILL TRADE—A genuine Slocomb micrometer, perfect condition, with measurements from 1/1000" to 1"; I would like a telescopic sight to fit a 42M Mossburg rifle. Ronald Kolpak, 58 West St., New Britain, Conn.

WANTED—Recent model combination tube and set tester. Want RCA Victor model HF-2, HF-4 or U-130. Must be in A1 condition. Will sell Simpson model 260 VOM, never used. Kenneth Lyons, 255 Commerce St., Hawthorne, N. Y.

FOR SALE—8mm Univex camera and projector complete with carrying case, in good condition. First $60 gets it. Also 3 canary breeding cages, complete with all nests and pads, $10. Lincoln Day, 365 Lafayette Ave., Grantwood 8, N. J.

WANTED—Hickok tube and set tester, model 510-X. Rider's Manuals volumes 1 to 5, unabridged. Charles Upton, LaFargeville 2, N. Y.

FOR SALE—1 kilowatt BC325 phone-CW transmitter, bandswitching, built in scope, ECO and Xtal. $350 complete. Abbott TR4 on 144 mc, $35. Abbott DK3, built in power supply and speaker on 144 mc, $25. Paul Wunsch, Jr., 387 Clifton Ave., Clifton, N. J.

FOR SALE—Weston switchboard meters, $10, laboratory and radio meters. Dynamic mikes and earphones, $5 each. IRC precision resistors, 1 meg., $1. Philco table radio, model 60, $12. Ampere hour meter, $5. GE watt hour, 2 element meter, new, $15. Power packs, $5. A. Livingstone, 12-01 Ellis Ave., Fair Lawn, N. J.

WANTED—Trade, sell or buy. Have complete QST volumes 7 and 8 year 1924, bound red cloth in good condition. Want complete unbound issues of Radio years 1938 and 1939. Best offer accepted. Dr. T. A. Gadwa, 214 Hillcrest Rd., Mt. Vernon, N. Y.

FOR SALE— OR TRADE—Transformers, class B input, Thordarson type, 6140. US microphone transf. type. Class B, $3.25, microphone, $2. Meter, Westinghouse 3" precision type with mirror back of needle for accurate reading. Less shunt, $3.50. All prices F.O.B. Chicago. Paul H. Prokes, 9216 S. Menard Ave., Oak Lawn, Ill.

WANTED—Riders' 9, 10, 11, 12; small aircraft battery receivers, transmitting rigs, tubes, transformers, etc., test equipment. State model, condition and price. Alfred Livingstone, 12-01 Ellis Ave., Fair Lawn, N. J.

CHECKING DEAD RECEIVERS

(Continued from page 4)

tain that it is present in the line cord at all.

Socket contacts sometimes loosen, causing intermittent lighting. The best procedure to follow here is to wiggle all the tubes about, noting where the intermittent occurs. If the lights are put out, sparking will locate the defective contact. Socket contacts may also short to ground and cause intermittent lighting. Socket lugs bent over, and resting near the chassis, are usually the cause of the trouble.

Intermittent filaments in a-c/d-c sets are quite common. Tube testers are generally inadequate in locating this type of defect. When the tubes have temporarily gone out, the a-c section of the voltmeter should be placed across each of the filaments in turn. When the full line voltage reading occurs, temporarily or permanently, the defective filament has been found. This reading is available because the voltmeter is in series with the tubes when it is placed across the open filament. Since the resistance of the voltmeter is much higher than that of the filaments, practically all of the line voltage is dropped across it.

When You Move or Change Your Address

Be sure to notify the Mailing Dept. of "The C-D Capacitor," Cornell-Dubilier Electric Corp., South Plainfield, New Jersey, giving the old as well as the new address, and do this at least four weeks in advance. The Post Office Department does not forward magazines unless you pay additional postage, and we cannot duplicate copies mailed to the old address. We ask your co-operation.

Better Than a Sandwich Man

Put those attractive colored display cards to work for you in your window or on your counter. They carry a terrific impact where competition is keen, where even an old-timer must sell his service over and over again to his community. These cards point up strong reasons for a 6-month radio check-up and show that you employ only new, genuine replacement parts. Display them prominently and business will come to you.

GET THESE C-D SALES AIDS!

- Newspaper Mats
- Match Books
- Counter Cards
- Stationery
- Decals
- Shipping Labels
- Postcards
- "C-D Capacitor"
- Catalogs

let yourself grow! See your local C-D jobber today and order these powerful sales builders. Most of them are FREE. If you're not on the regular monthly mailing list for your free "C-D Capacitor," write direct to: Cornell-Dubilier Electric Corp., South Plainfield, N. J. Other plants at New Bedford, Worcester, and Brookline, Mass.; and Providence, R. I.

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