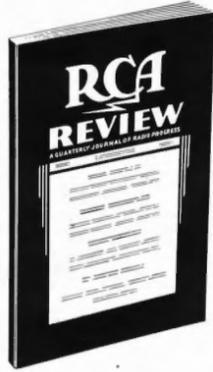


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# RCA REVIEW IS LAUNCHED FOR TECHNICIANS

## New Journal to Be Issued Quarterly

The new RCA REVIEW, to be published by the RCA Institutes Technical Press, will bring to technical men everywhere a complete and mature coverage of all important RCA developments in one journal. The new publication will review and summarize all engineering and laboratory accomplishments of RCA and its associated companies.



The introduction of the RCA REVIEW now makes it possible for service engineers and others, through one publication, to keep in touch with all important developments in the radio field. While the RCA REVIEW is confined to the activities of RCA, nevertheless the fact that RCA leads in practically all fields insures up-to-date information on all radio activities.

Articles in the first issue, which will appear in July, will include the following:

Iconoscopes and Kinescopes in Television—Dr. V. K. Zworykin.

Micro-Waves in NBC Remote Pick-Ups—O. B. Hanson.

Safety of Life at Sea—Charles J. Pannill.

Plans for Television Field Tests—R. R. Beal.

New Developments in Audio Power Tubes—Robt. S. Burnap.

There will be additional articles by C. H. Taylor, J. M. Clement, E. W. Engstrom and others.

Subscription to the RCA REVIEW is \$1.50 per year (four issues). Enclosed with this issue of RCA Radio Service News is a handy subscription card. Mail it and be assured of keeping ahead of the latest developments in the radio field.

# QUALITY OUTSTANDING IN NEW LOW-PRICE P. A. JOBS

## 12 and 20 Watt Equipments Use Velocity Microphone and Twin Speakers—Big Market Seen

Announcement of two new high quality, low priced P.A. equipments by W. L. Rothenberger, Manager of the RCA Commercial Sound Division, brings to service engineers everywhere an unparalleled opportunity for cashing in on the greatest P.A. market in history. Both of these equipments incorporate the latest and most advanced developments in the P.A. field. Genuine RCA Velocity Microphones, twin dynamic speakers with enclosed baffles acoustically treated with Ozite, high-gain, high-quality "Class A" amplifiers and excellent mechanical construction place these instruments definitely in the quality class.

The Type PG-98 equipment which has a 12-watt output, sells complete with all tubes, microphone, amplifier and carrying case, for only \$179.50 list, subject to an unusually attractive service engineers' discount. The Type PG-62-E—20 watts output—complete with all tubes and speakers and two-unit carrying case, is priced at \$299.50, subject to the same liberal discounts.

### P. A. Field Profitable

A profitable field for this equipment is the P.A. rental field. Usually the P.A. equipment pays for itself after a few rentals and then produces an income for the owner. If purchased on deferred payments, the rentals usually more than cover the payments that come due. Also, rental is the ideal method for making sales. It is very easy to close on the prospect who has previously used the equipment being sold.

While radio sets, refrigerators and many other appliances are sold through dealers, the P.A. market is essentially a service engineer's market, said Rothenberger. With the Presidential Campaign getting under way early, and the many summer prospects, such as dance halls, fairs, swimming pools and hundreds of others needing P.A. equipment, an unparalleled opportunity for making real money awaits the service engineer who aggressively goes after this market. Another feature about the sale of P.A. equipment that makes it especially attractive to sales engineers is that often such sales result in additional installation work and the opportunity for later maintenance work.

### PG-98 Has Single Case

The 12-watt equipment—Type PG-98—is unusually compact and

### SIGN READY

An attractive new sign, 12 inches long and finished in three colors, has just been prepared for all RCA Auto Radio Installation Stations. This sign is of the decalcomania type and includes a prominent RCA monogram. It may easily be mounted on a show window or may be applied to a glass and framed. The signs, which will shortly be distributed, will identify all the stations in the RCA Network and give them the prestige that the name RCA carries.

The RCA Service Division will also issue to Network Stations regular information on auto radio topics. One of these will be mailed shortly. It will be in the form of a pamphlet containing general information on auto radio installation and a comprehensive study of modern auto radio circuits.

portable. The two speakers are arranged on inclined baffles which fit together with the case of the amplifier and make one suitcase type unit 21 1/4 inches high, 21 1/4 inches long and 10 inches deep. The microphone is a genuine RCA Junior Velocity unit which has a frequency range from 50 to 10,000 cycles and is fitted with a rugged table type stand. The output of the microphone is fed into the amplifier through a 30-foot cable that is of new design and practically indestructible. The amplifier is conservatively rated at 12 watts undistorted output, while the maximum output is 25 watts—ample for auditoriums seating up to 1600 people. The overall gain is 110 db. and the hum level is unusually low. Other features include an easily accessible tone and volume control, a music-speech switch and radio-phonograph input connections. All units are finished in durable black leatherette.

### PG-62-E Has Two Units

The RCA PG-62-E P.A. Equipment is complete in two suitcase type instruments and will handle the largest and most complex P.A. installation likely to be encountered by a service engineer. While rated at 20 watts undistorted output, the maximum output is approximately 35 watts—ample for halls having seating capacities up to 3000 seats. The RCA Velocity Microphone is provided with an adjustable Banquet Stand and a 30-foot cable for connecting to the amplifier. The complete specifications are as follows:

#### Amplifier

Overall gain, 108 db.  
250-500 ohms input.  
Extremely low hum level.  
Music-Speech Switch.  
Separate voltage amplifier with volume control.  
Microphone volume control.  
Master volume control.  
Tone control.  
Phonograph and radio inputs.  
Ample gain for RCA Velocity Lapel Microphone.  
Provision for mixing voice with musical background.

#### Speakers

Two extra-large Electro-Dynamic Speakers.  
Completely enclosed baffles.  
Speakers treated with special acoustic material, Ozite.  
Attractive, hand-rubbed, walnut baffle plaques, with decorative grille.

## Niesen Returns



Glamorous Gertrude Niesen, now featured in the "Ziegfeld Follies" program, has recently returned from fulfilling several engagements at popular nightclubs on the West Coast. Programs such as this, plus one of the greatest political campaigns in history, will help to make the radio service profession a profitable one during the coming months.

## Lower Prices On Universal Transformers

### Both RCA Power and Audio Units Affected by Reduction

Recent price reductions on RCA Universal Power and Audio Transformers now make the use of these rugged units more desirable than ever for general replacement use. With a stock of only four RCA Power Transformers, one RCA Universal Output Transformer and one RCA Universal Audio Transformer, a service engineer may make a transformer replacement in practically any radio receiver regardless of its type, make or age.

The four power transformers cover the replacement requirements on practically all sets having from 4 to 12 tubes, regardless of whether 6.3-volt or 2.5-volt tube heater voltages are used. One of these transformers is also designed for sets with "class B" output amplifiers.

#### Replaces Any Audio Unit

The Universal Audio Transformer may be substituted for practically any audio transformer, connecting either a single or push-pull general purpose triode to either a single or push-pull grid circuit of practically any tube. The frequency response is excellent and is from 30 to 10,000 cycles. The turn ratio is 1 to 3.

Suspension hooks for hanging Speakers.

#### Tube Complement

1 RCA-57, 1 RCA-56, 1 RCA-59, 2 RCA-2-A-3, 1 RCA-80 and 1 RCA-83.

Finish: Durable black leatherette. Size: Complete unit ready for transportation (both cases same measurements): Length, 17 3/4 in., height, 21 in., depth, 12 in.

An attractive bulletin describing the features of these equipments is free upon request. Address your request to Dept. SN, RCA Mfg Co., Camden, N. J.

The RCA Universal Output

Transformer may be used to connect any output tube, either single or push-pull, to any dynamic type loud-speaker with a voice coil impedance ranging from 1 to 15 ohms. It is also furnished in a special tropical impregnation model at slightly additional cost.

The following table shows the various price reductions now effective:

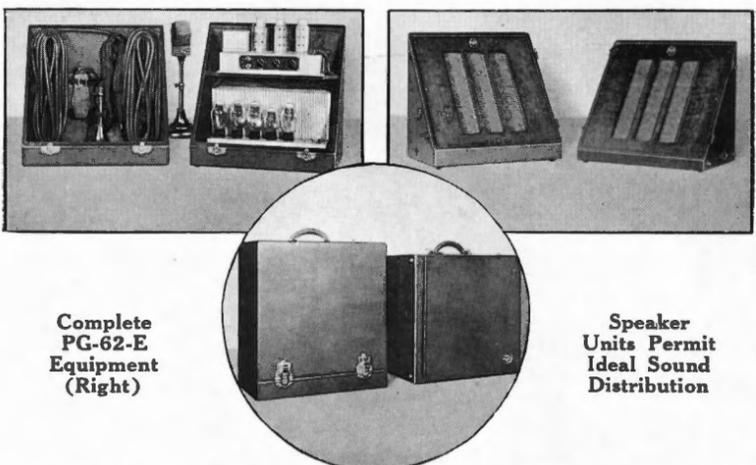
Stock No.	Description	Old List Price	New List Price
9551	Power Trans. for 10-12 tube sets	\$6.00	\$5.50
9552	Power Trans. for Class B sets...	6.50	6.00
9553	Power Trans. for 5-9 tube sets...	4.75	4.75
9556	Power Trans. for 4-tube sets...	2.06	2.00
7852	Output Transformer	1.95	1.75
7853	Output Transformer (Tropical)	2.42	2.35
9632	Audio Transformer	...	2.00

## New RCA P. A. Equipment



Amplifier and Microphone (Above). Complete PG-98 Unit (Right)

Double Speaker Units (Above)

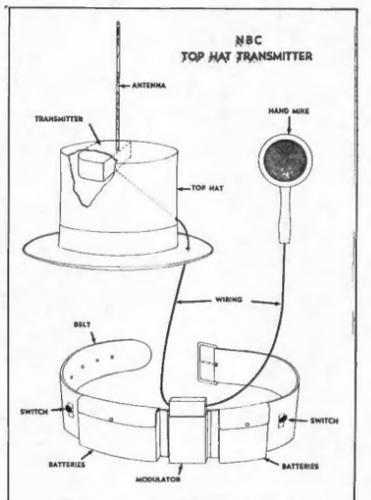


Complete PG-62-E Equipment (Right)

Speaker Units Permit Ideal Sound Distribution

Two new high quality P.A. equipments now make it easy to sell RCA Equipment on every P.A. job. Type PG-98 (above) has the low list price of \$179.50 while Type PG-62-E (below) has the low list of \$299.50.

## Top Hat Transmitter



A complete transmitter in the announcer's hat is the latest feature of special NBC broadcasts. Using a microphone transmitter and powered from batteries carried on a belt, the transmitter has a range of several miles.

# New Audio Oscillator Has Tapped Output Transformer

## Uses Acorn-Type Tubes and Has Direct-Reading Dial— Engineer Describes Design Considerations

By R. D. Scheldorf  
RCA Development Engineer

While in previous years, a radio service engineer required only simple mechanical tools, a set analyzer and a test oscillator to perform a difficult service job, today the situation is vastly different. High fidelity sets, new loudspeakers, more involved circuits, all tend to increase both the knowledge required and the equipment needed to successfully service a modern receiver.



R. D. Scheldorf

When the RCA Beat Frequency Oscillator was developed, the factor of portability was considered the most important item, assuming, of course, that the rigid performance specifications could be met. By careful planning and engineering a Beat Frequency Oscillator was produced that could be built in the same case as other RCA Test Equipment.

A steel case instead of the usual aluminum case adds to the ruggedness of the construction of this new RCA Beat Frequency Oscillator while the standard baked wrinkle lacquer finish is used. All lettering and marking of the front panel is produced on a single, reversed, etched nickel silver plate, covering the entire oscillator front.

The electrical circuit consists of a power supply and the audio frequency generating circuit. Power from 110-volt a-c lighting circuits is used while the power consumed is only 15 watts. Protection from improper power supply is provided by a fuse in the primary circuit.

### Circuit Description

The RCA TMV-134-A Beat Frequency Oscillator consists of two radio-frequency oscillators whose outputs are combined in a detector to produce the desired audio beat note or difference frequency which is amplified and fed to the output transformer.

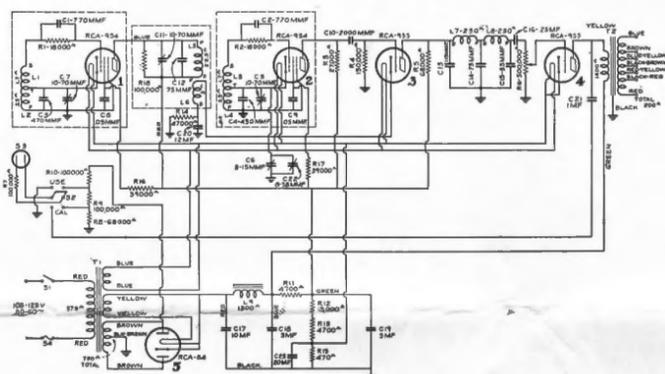
Acorn-type tubes are used everywhere except as rectifier because shielding problems are reduced to a minimum. (See interior view.) If tubes other than acorn-type tubes were used, shielding problems would be tripled unless special, costly shields were made. For example, a complete tube shield would be required, including grid cap shielding.

Also, all grid leads would have to be run in shielded leads. Also, the oscillator elements of capacity and inductance must be placed in separate shielded compartments requiring much longer leads from each tube to the oscillator elements which greatly increases coupling between oscillators. The capacity between cathode and filament is also an important item to be considered when electron-coupled oscillators are involved. The capacity of an acorn tube cathode to filament is only one-half that of an ordinary tube. This tends to reduce intercoupling between oscillators caused by using a common filament source.

In the RCA Beat Frequency Oscillator a single shield is all that is required to completely shield the fixed oscillator from the variable oscillator. No high potential r-f leads enter the shield and, since the output plate connection is at the top, ideal shielding is the result. As the detector and audio amplifier, the use of acorn tubes reduces lead lengths to a minimum.

### Circuit Function

Referring to the schematic circuit



Schematic diagram of RCA Beat Frequency Oscillator.

diagram, the following action takes place.

A fixed r-f oscillator stage, consisting of a self-biased RCA-954 acorn-type pentode and its associated capacity and inductance, oscillates at a frequency of 350 kcs.; the second grid of this tube operates as the oscillator plate. The plate (termed "work plate") is electron-coupled to the oscillation-generating portion of the tube and feeds into the primary of the i-f transformer. The secondary of this i-f transformer is connected in series with the cathode of

## Has 30 to 15,000 Cycle Range



Features of the new RCA Beat Frequency Oscillator include a tapped output transformer, balanced to center tap, a neon frequency checker and a direct reading dial. RCA Parts Distributors are featuring this instrument at the low net price of \$64.50. On easy terms, it may be purchased for \$10.00 down and \$5.24 per month over a 12-month period.

the self-biased RCA-955 acorn type detector tube which provides detector-cathode modulation at the frequency of the fixed oscillator. The variable r-f oscillator stage

supply the audio voltage, an output transformer or coupling reactor is necessary.

The power supply consists of an RCA-84 full-wave rectifier working into a condenser input-filter circuit. The output of the filter circuit supplies the d-c voltages required for the various circuits of the apparatus.

### Neon Lamp Indicator

A neon lamp is used either as a pilot lamp or as a calibration indicator, depending on the position of the indicator switch. In the "calibration" position a portion of the a-c voltage from the high-voltage winding of the power transformer is impressed on one plate of the neon lamp from the junction of resistors R-8 and R-9 through a 100,000-ohm resistor R-7. The other plate of the neon lamp is connected through C-21 to the output of the RCA-955 amplifier. Proper calibration is indicated when the two frequencies applied to the neon lamp are the same. The lamp will then stay lit continuously or stay out continuously, depending on the phase relation of the applied voltages. When the frequencies are nearly the same, both plates of the lamp will flash together at the difference frequency. In the "on" position, the neon lamp is connected from the junction of resistors R-9 and R-10 to ground and acts as a pilot lamp. A small air condenser C-6 is connected in parallel with the main frequency control to change the frequency of the variable oscillator for setting the calibration point.

### New Alignment Wrench

The new stock No. 12636 Alignment Wrench is just what every



service engineer needs to adjust the new air trimmers on the 1937 RCA Victor receivers. It is made of heavy fibre, 3/8" in diameter and 8 1/2" long. One end of this tool has a

## About Books

(Continued from Page 2, Column 5)

Of course, an important factor in making up the Operating Statement is the cost of doing business. The author goes into this subject exhaustively and provides a means whereby the true cost of each job may be passed on to the customer.

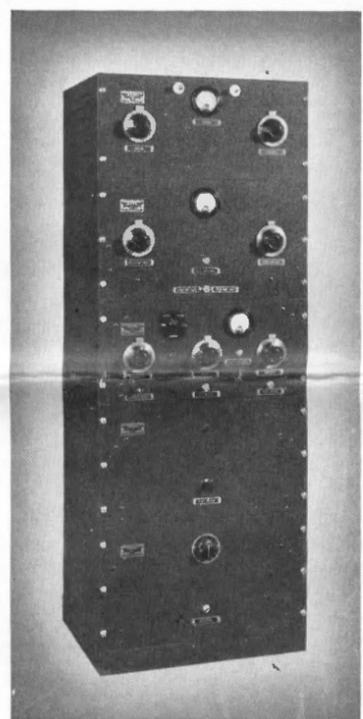
Each subject is completely covered. While to the experienced bookkeeper there might seem to be unnecessary repetition, the inexperienced service engineer who is trying to establish an adequate but not elaborate system of records will appreciate the detailed instruction.

It is obvious the author wrote the book for radio service engineers rather than for bookkeepers. The items appearing, for instance, on both Balance Sheet and Operating Statement are discussed from both angles.

Each form provided to be used in the system is illustrated in the book. In the last chapter, all the forms are shown with specimen figures entered on them and there are explanations of how the figures were arrived at.

Undoubtedly this is a book for which there has been a great need and which will be welcomed by thousands of people in the radio service and set business. It may do much to improve the condition of the business.

## Transmitter



The new RCA ACT-200 Amateur Transmitter is conservatively rated at 200 watts output (phone) and 260 watts output (c-w). It is being featured by all RCA Amateur Radio Distributors at the low net price of \$375 (c-w) and \$475 (phone) complete with coils for one band.

special hook needed to engage the condenser shaft, while the other end has a hexagon socket wrench having three inches of clearance inside the shaft. RCA Parts Distributors are featuring this tool at \$1.00 net to Service Engineers.

## Uses Acorn Type Tubes



### Uses RCA-955 Detector

The two r-f oscillator signals, one entering the cathode circuit and one entering the grid circuit, are detected by the RCA-955. The output of this stage is fed to the control grid of the RCA-955 fixed-bias amplifier through a two-stage r-f filter. This filter allows only the detected audio voltage to be applied to the amplifier grid. The output control R-6 is connected in the grid circuit of the amplifier stage and allows continuous control of the output voltage. The output of the amplifier stage is then fed into a statically shielded output transformer. This transformer is designed to work into loads of 250, 500 or 5,000 ohms. A center tap is provided so that lines or circuits of these impedances may be balanced to ground.

Without the output transformer, low impedance circuits can be supplied only with a large reduction in voltage or an increase in distortion. Besides having centertapped output impedances of 250, 500 and 5,000 ohms, output impedances of 62.5, 125 and 1,250 ohms are available by connecting from centertap to one side of the transformer.

If no output transformer is supplied in the instrument, some type of impedance matching device is needed in nearly every use. Where the oscillator must have a closed path for direct current as well as

## Unique Window Display



The above photo of the Pacific Radio Exchange's window, located at 731 S. Main St., Los Angeles, Calif., shows how the various RCA sales aids may be used to produce an attractive window. Note diagrams in center panel.

Use of four new acorn type tubes and unusually compact construction make the new RCA Beat Frequency Oscillator ideal for all requirements for a variable audio frequency alternating current source.

# Service Tips



Now you can win your choice of a handsome pigskin wallet or an RCA Service Engineer's Pencil by sending tips to RCA Radio Service News, Camden, New Jersey. . . . Service Tips must be acceptable for either RCA Radio Service News or the RCA Radio Service Tip File. . . . All tips become the property of RCA to be used as they see fit. . . . Service Tips are our readers' ideas, not ours. While RCA Radio Service News believes they are worthwhile, we cannot be responsible for results.

### Editor's Note

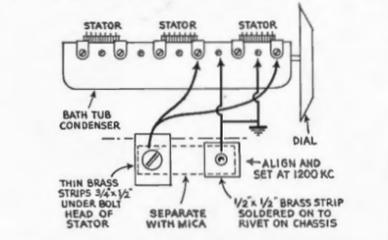
In the RCA Service Tip File, a tip from Mr. E. M. Prentke of Cleveland, Ohio, describes a method of replacing the antenna-type volume control of the Radiola 17 and 18 with a dual unit that also controls the bias voltages.

A number of Tip File owners have inquired where a volume control that would meet the mechanical requirements for such a job could be obtained. Mr. Prentke has advised that the old style Model 74-601 Centralab Dual Control, having a 10,000-ohm antenna tapered section and a 25,000-ohm tapered bias section, be used.

### RCA Radiola 60

There are quite a number of these old supers still out among the public, and with a little care they can be made to work at an unbelievably high efficiency.

First, weak signals can usually be traced to a carbon 20,000-ohm bleeder in the power pack. This bleeder changes value and in most of those removed the value ranged from 2500 to 3700 ohms. The best



value is 10 watts, 20,000 ohms. The plate voltage usually will show about 90 volts on the i-f transformers when this trouble occurs.

Another thing commonly found is the poor sensitivity of the higher frequency side of the band. By adding two small trimmers, made of one-half inch square .001 brass, and properly mounting them, this trouble will be completely remedied. Align the receiver completely.

Adjusting the i-f transformers to 180 kcs. will give the set a very noticeable gain in selectivity. Start with No. 3 i.f. The i-f transformers are under the tuning condenser. The ones toward the tubes are i.f.; the ones toward the front of the set are neutralizing.

J. W. Clark, Geyser Radio Shop, Calistoga, Calif.

### Centering Speakers

I have found that, by using the RCA Piezo-Electric Calibrator, a very simple means of centering speaker cones can be evolved simply by setting the calibrator to the "Hi" scale, tuning the set to 1000 kcs., adjusting the volume control for a fairly heavy note, unloosening the speaker cone centering screw, allowing the cone to take its course, and retightening the screw. On the later models such as the small console jobs of RCA, or all other sets using spiderless cones, this adjustment can be made without removing the speaker from the cabinet. I think the RCA Piezo-Electric Calibrator is the finest all around piece of testing equipment that has been developed in years.

Johnnie Mulligan, Service Department, Barker, Rose & Kimball, Inc., Elmira, N. Y.

### Metal Tube Checking

Have you ever tried to analyze one of the early metal tube sets and found to your dismay that your octal analyzer plug did not fit the octal sockets of the set because some of the holes were blanked out by the manufacturer?

An accurate way to remedy the above condition is to get an octal tube base from a defective tube and use it as a drilling jig or template by removing all pins except Nos. 1, 2 and 8, and inserting this into the socket to be drilled and proceed with the drilling. Use a No. 41 drill.

E. A. Jozwick, 84 West 16th Street, Bayonne, N. J.

### RCA Radiola 80

I have found that by replacing the 24A's in the first r.f. and the first i.f. with 35's, and removing the 6000-ohm resistor that is shunted across the volume control, the tone of the RCA Radiola 80 is greatly improved on local stations and there is better control of volume.

Douglas W. Rivenburg, 1023 Morgan Ave., N., Minneapolis, Minn.

### Caution!

Never wear a ring when working around auto radios, since this can become a dangerous menace once shorted across the storage battery. I know of a case where a finger was burned to the bone when this happened.

Moral: Never wear rings when working and save a finger.

Stanley Zawacki, Wilson Appliance Co., Cor. 91st & S. Chicago Ave., Chicago, Ill.

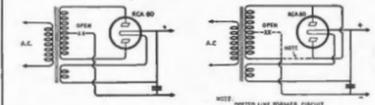
### Chevrolet Ignition Noise

Complaints from Chevrolet car owners regarding ignition noise interference, especially on those radios using spark plug suppressors, can often be traced to the two sets of high tension wires that pass through the two brackets to the first two and last two spark plugs in the motor. The original equipment on these cars is rubber covered high tension wire and invariably the wire will chafe on the thin sheet-metal brackets, due to the vibration, oil and heat of the motor, causing a high tension leakage at this point which cannot easily be seen. The remedy is to pull the wires out of the brackets and run them direct, or, better yet, replace all the distributor wires with high tension lacquered cable.

Alexander Makul, 139 Bergen Avenue, Kearny, N. J.

### Transformer Repair

Occasionally during the course of my service work I run across a receiver where the secondary high voltage winding on the power transformer has an open or a burned-out centertap due to a bad short in the



filter circuit, but in which the winding is O. K. otherwise (Fig. 1).

I simply make a half-wave rectifier circuit out of it (Fig. 2), connecting the two '80 plates to one side of the high voltage winding and connecting the minus to the other. The output voltage remains the same as before, and you save time and trouble, not to mention the price of installing a new transformer.

George W. Anton, 139 Shepherd Ave., Brooklyn, N. Y.

### Philco Model 600-C

Numerous complaints have been made to Philco dealers and distributors that the tone of the Model 600-C Midget is too high pitched and inferior to its predecessor, the 59-C of last year. I have found that the addition of a 25-microfarad, 50-volt electrolytic condenser from ground to the centertap of the power transformer high voltage secondary is just what is needed to remedy this situation. There is just room enough to squeeze in a cartridge-type condenser next to the volume control and the usual pigtail leads are long enough to reach the proper lugs on the bakelite condenser now connected between the points mentioned. The present value is .05 microfarad.

Robert C. Herron, 835 E. Main Street, Riverhead, N. Y.

### Cleaning Cabinet

For eradicating acid on chassis (caused by capacitors exploding), use a good mechanic's soap on a dry rag. It works wonders.

Rudd Hardesty, Jr., 44 San Mateo Drive, San Mateo, Calif.

### European Reception

Recently I made an installation of a doublet antenna that had been erected North and South with the idea to obtain best reception East and West, particularly European.

However, short-wave radio from Europe comes in here at the direction 15° East of North (magnetic or compass guide). By making an antenna change so that this direction was broadside to the doublet, a big improvement was immediately noticed.

Gordon Rosekilly, 4037 26th Street, San Francisco, Calif.

Editor's Note: If one checks the direction of European stations on a globe, it will be seen that the European countries are not only considerably North of the United States but also that a great circle route is the shortest distance. This means that the direction of reception is even farther North—a good point to keep in mind when giving directional characteristics to doublets.

### Testing Auto Radios

When repairing automobile radios such as the M-34, GE B-40, etc., that have the power transformer on one end, to drop the vibrator noise level while testing the radio on the bench, do not put a shield on the bottom of the set; instead, put a shield against the end where the power transformer is located. This shield must extend from the table, or the bottom of the set, and touch up against the vibrator and filter pack. This reduces the vibrator noise tremendously.

E. M. Winter, Winter's Radio Shop, 317 W. Duval St., Jacksonville, Fla.

### Crosley "Buddy Boy"

This particular job uses a 24A as a dynatron oscillator, which is very efficient but critical as to screen and plate operating voltages. Several have been serviced with the same fault, the sets died out from 750-500 kcs. A new tube is not a permanent repair; the jobs come back!

The fault is in the drop of voltage delivered by the combined bleeder network. Increase the volts to plate and screen, and the set will be as good as new. The simplest method is to either short or shunt a 1,000-ohm resistor across the bleeder section supplying the screen grid voltages. Either way, operating and bias voltages work out nicely, and the increased screen volts do the trick.

Eddy K. Watkins, 174 Baker Street, New Brighton, Christchurch, New Zealand.

### Abrupt Volume Change

We recently had a severe case where the volume would increase or decrease as different lights were switched on or off in various sections of the house, or when the electric refrigerator automatically started or stopped. This would necessitate getting up and readjusting the volume control which, to say the least, caused the customer no little inconvenience.

This condition was finally cured by shunting a .1 mfd, 400-volt condenser across the light switch that was the greatest offender. The set was probably picking up r.f. through the 110-volt line. Snapping a light switch on increased the r.f. potential or acted the same as increasing the size of the antenna. By shunting a condenser across the switch, the r.f. potential was kept constant regardless of the switch position.

J. H. Rubenstein, United Radio Service, 420 Harrison Street, Syracuse, N. Y.

## Magnetite Is Used In New Transformers

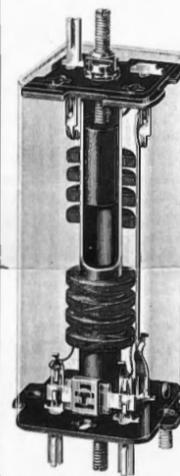
### Oscillator and I-F Transformers Are Increased In Efficiency

Elimination of adjustable trimming capacitors, reduction of coil size and higher gain per stage are but a few of the many advantages of the new RCA Oscillator and I-F Transformers which have Magnetite cores. Such transformers are a feature of the new 1937 RCA Victor Receivers and are one of the many noteworthy advances incorporated.

Magnetite is a natural ore, being a magnetic iron oxide, Fe<sub>3</sub>O<sub>4</sub>, which is ground to the particle size desired and then molded into a core. With such a core, the inductance of transformers can be varied for alignment purposes, the usual shunt capacity method not being necessary. This permits tuning capacitors to be fixed in value and of smaller size. A further improvement is lower losses in a tuned circuit (higher Q) which results in higher gain and greater selectivity.

### 460 K.C. Transformer Has Two Cores

The illustration below shows one of the new standard 460-kc. i-f transformers designed for the new 1937 RCA Victor Receivers. The cut-away section shows the position of the Magnetite core in relation to



I-F Transformer

the secondary winding. There is a similar core inside of the primary winding. The small fixed mica condensers, one in the foreground at the base of the unit, and the other at the top of the unit and on the opposite side of the coil tubing, are shunted across the primary and secondary windings, thus completing the resonant circuits. Coil and condenser tolerances are compensated by adjusting the cores relative to the universal wound sectional coils. Tuning is accomplished by screw driver adjustment of the brass screws protruding at the two ends of the transformer. The screws are molded into the ends of the Magnetite cores.

To avoid serious changes in mutual coupling between primary and secondary, the constants are chosen so that in adjusting the cores they need never penetrate the coil section nearest the associated primary (or secondary) winding.

## Southern Belle



Linda Lee, featured vocalist of Russ Morgan's orchestra, is heard over NBC air waves three nights weekly. Linda hails from New Orleans, where she honestly obtained her Southern accent.

## Tells How RCA Easy Payment Plan Operates

### Immediate Delivery of All Equipment Featured

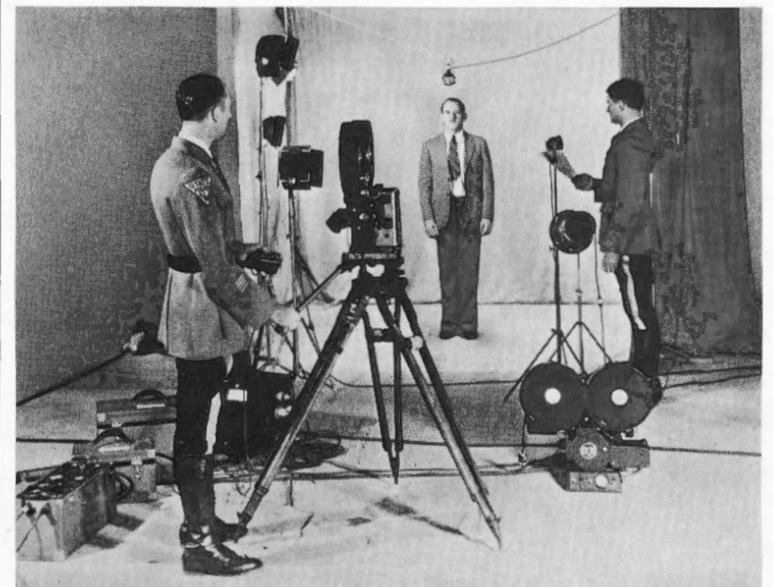
The simple manner in which the new easy payment plan for RCA Test Equipment works was explained by E. N. Deacon, Manager of the RCA Parts Division, at the recent meeting of Distributors' Service Managers in Camden. As Mr. Deacon explained, any of the eight test instruments that have been approved for the plan, or any others later approved, may be purchased either singly or in combination, provided a minimum purchase of \$40 is made. RCA Parts Distributors require only a simple application form to be filled out, which is promptly passed on. Delivery is contingent upon approval of applications. Usually the entire transaction takes less than 24 hours.

### Small Down Payment

Another feature that Mr. Deacon stressed is the unusually easy terms offered in this plan. The down payment is 10 per cent or \$10, whichever is higher, and the payments may be extended over a period up to one year.

From the service engineer's viewpoint, the plan is ideal. It permits him to have immediately the equipment he requires to do more efficient work and thereby increase his income. If the ownership of RCA Test Equipment is properly exploited, the equipment should easily pay for itself within the first year, concluded Mr. Deacon.

## Records Picture and Voice



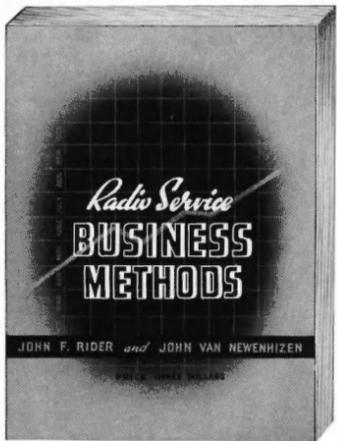
A typical set-up for making sound motion pictures of a criminal for purposes of quick and accurate identification in the future. RCA Telephone engineers in cooperation with Colonel H. Norman Schwarzkopf, former N. J. State Police head, worked for many months on the development of the most suitable sound-movie apparatus and technique.

## THREE-POINT SERVICE PLAN COMPLETED WITH NEW BOOK

Radio Service Business Methods Delivered to All Owners of RCA Three-Point Service System

"Radio Service Business Methods," a 220-page book published by RCA and written by John F. Rider and J. Van Newenhizen, is just off the press and is now being shipped to all RCA Parts distributors as the final unit of the RCA Three-Point Service System. RCA Parts distributors have a copy of the book for every service engineer who bought the RCA Three-Point Service System and met the terms of his distributor's offer.

The other units of the RCA Three-Point Service System are the famous RCA Radio Service Tip File and the booklet, "101 Service Sales Ideas." The Tip File was offered also as a separate unit by RCA Radio Tube distributors. Service engineers



220 pages of information on how to conduct the radio service business profitably.

who obtained the tip file on the RCA Radio Tube offer can now obtain the book, "Radio Service Business Methods" on a new RCA Radio Tube offer. The RCA Three-Point Service System offer is still in effect for those who want all three units. Each unit is a valuable aid in one of the three elements of a service business—technical efficiency, sales, and administration.

### Authors Well Known

The names of the authors of this new book will commend it to thousands of service men. Few men are so well known in the service industry as John F. Rider, publisher of Rider's Manuals, "Servicing Superheterodynes," "The Cathode Ray Tube At Work," and other books for the service engineers. J. Van Newenhizen is an auditor and accountant with long experience in the radio field.

Never before have the record keeping and general administration problems of the radio service business been covered so thoroughly and in such a simple, practical manner as they are in "Radio Service Business Methods," according to E. N. Deacon, in charge of sales of RCA Radio Tubes and Parts. "We spared neither time nor expense in prepar-

## COSTS VITAL KNOWLEDGE, SAYS AUTHOR

New Book Shows How to Make Proper Charges

"Radio Service Business Methods," the new book just published by RCA, makes possible the first step toward more profitable prices for radio service work, according to John Van Newenhizen, one of the authors of the book which is now obtainable from distributors of RCA Radio Tubes and RCA Parts.

"Many service engineers who charge ridiculously low prices do so not with the intention of demoralizing the radio service business, but because they do not realize that their charges do not cover their costs. A simple cost-finding system put into use for even a short time would open the eyes of these persons. Many of them would be startled on discovering what it really costs them to do a service job.

"Almost every business man has at least a vague understanding of what is generally called 'overhead,' but in many cases the charges made for radio service seem to ignore this factor in expense," continued Van Newenhizen. "There are two reasons for this state of affairs: First, many service businesses do not know how to ascertain the total of their overhead expenses, and secondly, they do not know how to divide the total between all of their customers so that each customer pays his fair share. Much of the text of 'Radio

ing this much-needed book," said Deacon. "Readmade bookkeeping systems, to which a business must be made to fit, are easy to get. Evolving a simple record-keeping system that would fit the service business was another matter. We developed one system, put it to the test, and found it needed revision and further simplification to make it satisfactory to the average service man. Rather than issue any plan of operation that

## Transceiver Aids Student Flyers



A new application for the RCA Transceiver is that of maintaining a two-way communication system between student pilots and instructors at the Oklahoma City Airport. George A. Hales, Vice-President of Hales-Mullaly, Inc., RCA Victor Distributors, is shown demonstrating this unit to two local aviators. The RCA ATR-219 Transceiver is featured by all RCA Amateur Distributors at the low net price of \$19.95.

Service Business Methods,' is devoted to the solution of this all-important problem.

### Helps Prepare Balance Sheet

"Two of the objects of any book-keeping system are to enable the proprietor of a business to prepare a balance sheet and an operating statement whenever he desires to do so. The RCA Radio Service Record System makes possible the preparation of these standard business statements with a minimum of time and effort devoted to bookkeeping.

"The percentage of businesses that fail within a year or two after they are started is tremendous, running as high as 80%. Of course, there are many reasons for business failures. A good system of records will not necessarily cause a business to prosper but very few businesses that prosper are operated without an adequate system of records.

"The majority of radio service engineers are not bookkeepers or accountants and we have no desire to make them bookkeepers or accountants.

"And yet record keeping can be overdone. Most radio service businesses, for instance, have no need for a complex system of double entry bookkeeping. It is true that only a double entry system will provide a highly accurate cross check but this is not generally needed in the radio service business. What is needed is a simplified system that provides only essential information. This is what we have attempted to provide in the RCA Radio Service Record System."

we did not feel was 100% suitable, we postponed publication of this book until we could devise a new system that would stand the test of actual use.

### RCA's Contribution

"This book is the result, and we are proud to offer it as RCA's latest contribution to the welfare and prosperity of the service industry. I am confident that if the plan of operation outlined is put into use many of the profit-destroying practices now common in the business will be eliminated.

"There are no tricks involved in the use of the record-keeping system. Anyone could design his own business forms for use with the system. To reduce the cost of necessary forms as much as possible, RCA has prepared the forms and offers them at prices that could not be matched by a local printer."

### RCA OSCILLOGRAPH CALIBRATOR SHIELD

A special calibrator shield, for mounting on the end of the RCA-906 Cathode Ray Tube, is now available at all RCA Parts Distributors at the low net price of 25 cents. It is easily fitted to the RCA Oscillograph, having holes that fit under the escutcheon mounting holes. Service engineers owning oscillographs should make use of this new shield which greatly facilitates measurements, etc., on their oscillographs.

## SERVICE MEN CONTRIBUTE TO NEW BOOK

Questionnaires Give Basis Of Facts Presented

While the book, "Radio Service Business Methods," describes methods of ascertaining costs, determining profits or losses, etc., it does not attempt to deal in specific figures or to state in specific amounts what costs of operation or charges for service should be. Nevertheless, the authors had unusually complete statistics on the service industry for their guidance in writing the book.

### Two Surveys Made

Two separate surveys of the service industry were made. A lengthy questionnaire was sent by Rider to 15,000 service men. More than 2700 responded. The replies were tabulated and published as "The Rider Survey," a booklet which has attracted widespread attention among manufacturers and others who supply the service industry with merchandise. Van Newenhizen conducted another survey that revealed many significant facts about the administrative methods and record keeping—or rather, lack of record keeping—activities of service engineers.

In discussing his survey, Van Newenhizen expressed his gratitude to the hundreds of service men who replied to his questionnaire, "In order that service men would feel free to reply frankly to all of the questions, some of which were of a personal nature, we asked them not to sign their names to the questionnaires. Consequently, I was unable to thank them individually for their cooperation but I want them all to know that it was appreciated."

### Need For Book

That there is a crying need for such a book as "Radio Service Business Methods" is shown not only by the replies to the questionnaires but by the intense interest invariably shown in the lectures on this subject that Rider has given during the last several years. On the question on this subject in Van Newenhizen's survey, service engineers were emphatic in replying that such a book was needed.

larly used form, Daily Chargeable Time Report, requires only one short entry every day. This form helps to provide the all-important "cost of service." Entries on all forms, except on the invoice forms, may be made at the convenience of the operator.

All of the forms are punched to fit standard binders that may be obtained in stationery stores in various sizes and prices.

## FORMS FOR RECORD SYSTEM FIT ALL STANDARD BINDERS

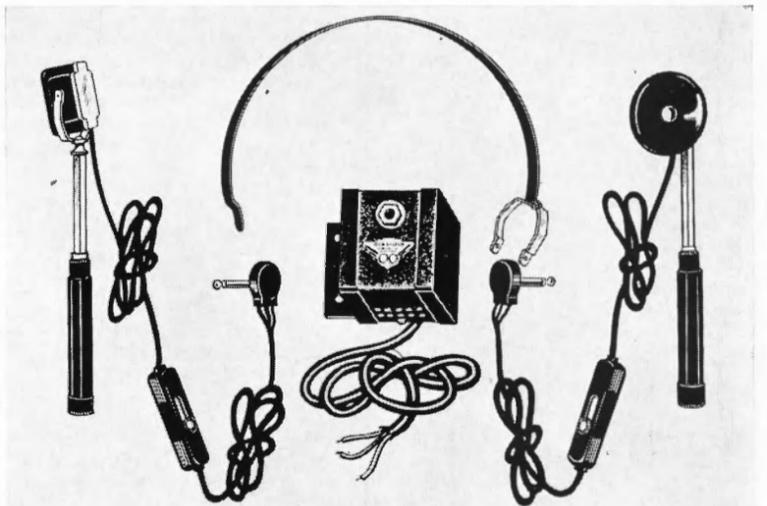
There are eleven forms provided for the RCA Radio Service Record System. Entries on most of these forms are made only occasionally, such as once a month. Only five of the forms come into daily use. Of these five, two are invoice forms and supersede less appropriate forms which may now be in use.



These forms are available for keeping all records.

Another is an Accounts Receivable Statement which is provided because, according to the author, "Certainly every business needs a list of those who owe their business money." Another of the regularly used forms is the Sales and Cost Summary which is an invaluable summarization of cost compared with billing prices. The fifth regu-

## Sonotone Units For Radio



Special models of the famous Sonotone Hearing Aids are now available through all RCA Parts Distributors. The Air Conduction Unit, shown on right, complete with cord, jack and sliding type volume control, is \$25.00 list. The Bone Conduction Unit, shown at left, complete with cord, jack and sliding type volume control, is also \$25.00 list when fitted with the lorgnette type handle. With the headband it is \$22.00; while the headband alone is \$1.00, all list. The Connector Unit, complete with 30-inch cable, is \$3.50 list, and is easily connected across the voice coil of any radio receiver. It has three positions, one for radio alone, one for both radio and Sonotone and one for Sonotone alone. The impedance of these units is 40 ohms.

## Now Complete!



Delivery of the new book, "Radio Service Business Methods," by John F. Rider and J. Van Newenhizen, completes the famous RCA Three-Point Service System. This book, which has been delivered free to all owners of the RCA Three-Point Service System, is being featured by both RCA Parts and Tube Distributors.