



# RADIO SERVICE NEWS

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Vol. I, No. 1

## 18,648,162 SETS IN HOMES AND CARS MAKE HUGE MARKET

*Quality Service Essential to  
Every Division of  
Radio Industry*

The importance of the radio service sales business is emphasized by figures recently compiled by the Columbia Broadcasting System in co-operation with a number of other organizations. These figures show, as of January 1, 1934, 17,948,162 sets in American homes, plus an additional 700,000 automobile installations—a grand total of 18,648,162.

If these radio sets are to reproduce faithfully the million-dollar radio show placed on the air every week, they must be periodically inspected by a service expert. No matter how well a radio set is built—no matter how much the customer pays for it—that set, to give continued high-quality reproduction, needs constant attention the same as a high-quality automobile needs frequent "tuning up" for maximum performance.

The gigantic task of keeping almost 19 million radio sets in proper operating condition falls on the shoulders of radio service sales engineers. This obligation again emphasizes the important rôle of the radio service sales engineer in the industry. Upon him the broadcasting stations, the advertisers who use broadcasting facilities, the radio manufacturer, the radio wholesalers, the radio dealers and the American public depend in a large degree for their success and happiness.

The influence of the service branch in the radio industry is limited only by the extent to which it accepts its responsibilities.

## GIVE RUTH ETTING A BREAK!



When Ruth Etting steps up to a CBS mike, millions of listeners are waiting to be charmed by her beautiful voice. Only good radio sets in perfect operating condition can do justice to her singing. Give Ruth Etting, as well as radio's other headliners, a break by keeping the radio sets in your community in tip-top operating condition.

## RCA DEVELOPS NOISE-REDUCING ANTENNA SYSTEM

*International Communications  
Experience Built into Product for the Home*

Out of the vast experience of RCA in the world-wide communications field has come a remarkable antenna system for home use, known as the RCA World-Wide Antenna System.

RCA began as a communications company. Although it has expanded into other fields, nowhere is its leadership more apparent, or has it been longer established, than in the world-wide communications business which it pioneered.

Through its subsidiary company, R.C.A. Communications, Inc., the Radio Corporation of America has developed a far-flung network of commercial stations that cover the globe and serve hundreds of thousands of patrons annually. In addition to its international communications business, R.C.A. Communications picks up at its great Riverhead, L. I., stations a majority of the foreign radio programs re-broadcast in this country. Antenna systems play a vital part in R.C.A. Communications' work, since unfailing reliability in the reception of signals from half-way around the world is essential.

Thus, when RCA engineers set out to build an antenna system for home use, to take care of the growing demand for a good antenna system for all-wave radio sets, they were able to fall back on the most extensive radio communications experience of any company in the world. The result is a home antenna system which has a high degree of reliability and is, by far, the finest product of its type ever offered the American public.

*(Continued on page 8)*

## RADIO SERVICE SALES ENGINEERS—An Editorial

By E. M. HARTLEY, Manager, RCA Parts Division



E. M. Hartley

### Growing pains are—painful.

The radio service industry has grown tremendously, faster than any other branch of the fast-growing radio industry except, possibly, the tube industry.

**It is perfectly natural, therefore, that the service business has had, and still has, growing pains.**

Only a few years ago there were so few persons with technical knowledge of radio receiver design that most radio owners had to rely on some amateur in the neighborhood when trouble was encountered with the comparatively simple circuits of those days.

**It was not long, however, before this condition was changed. The dearth of radio technicians was followed by an epidemic of self-styled "radio service men." The reason for this condition is not hard to find. Probably no other new industry**

**has inevitably developed and trained its own technicians as radio has. Every amateur operator, every home-set builder—and there were hundreds of thousands of them at one time—every commercial operator acquired a working knowledge of radio principles. In addition, the Army and Navy, to say nothing of correspondence schools, turned out "radio experts" by the thousands.**

It was only natural that many of these "radio experts" should turn to the radio service business for a livelihood. And when the depression came along, it was easy for thousands more to pick up their screwdrivers and soldering irons, have a few business cards printed, and become "radio service men."

The result was confusion, even greater confusion than that which always marks the early years of a new industry.

The radio service industry had no traditions, no standards of value. There was no organization, no realization of mutual interests. In short, there was chaos.

**Competition, and the lack of standards, placed the business on that weakest of all foundations, price. Price ruled, without regard to quality or service.**

"Free service" became the vogue. How any business can give away "free" its principal stock-in-trade remains a mystery, but nevertheless the offer of "free service" became one of the curses of the radio service industry. Cut-throat tactics were the order of the day. Shoddy replacement parts were installed in a shoddy manner.

**Public confidence in the huge radio service business was sadly undermined. And the tragedy of it all was that the competent radio service engineer, who conducted his business on a business-like basis, suffered equally with the public.**

Now the radio service industry is coming of age. It is organizing, setting up standards. Order is beginning to come out of chaos. The business is building for

*(Continued on Page 4, Column 1)*

# Ease of Installation a Feature of RCA World-Wide Antenna System

## Four Features Responsible for High Performance

There are two distinct reasons why the radio service sales engineers who have seen the RCA World-Wide Antenna System are enthusiastic about it: Ease of installation, and the real engineering features that have been built into the system.

### Four Engineering Features

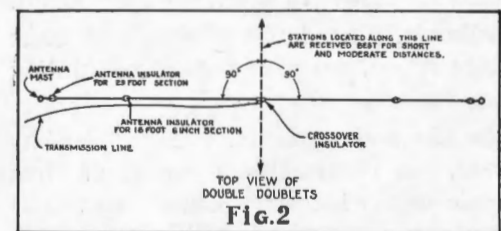
The features of the RCA World-Wide Antenna System are summed up as follows:

1. An efficient double doublet antenna system specially designed for short-wave reception.
2. A balanced transmission line of proper length for best matching to the doublet antenna system and the Receiver Matching Transformer.
3. A specially developed Receiver Matching Transformer designed to eliminate noise picked up on the transmission line and to match the transmission line to most short-wave and all-wave sets on the market.
4. Provision for improvement of broadcast reception when using the double doublet as the collector for signal energy.

### Double Doublet Antenna System

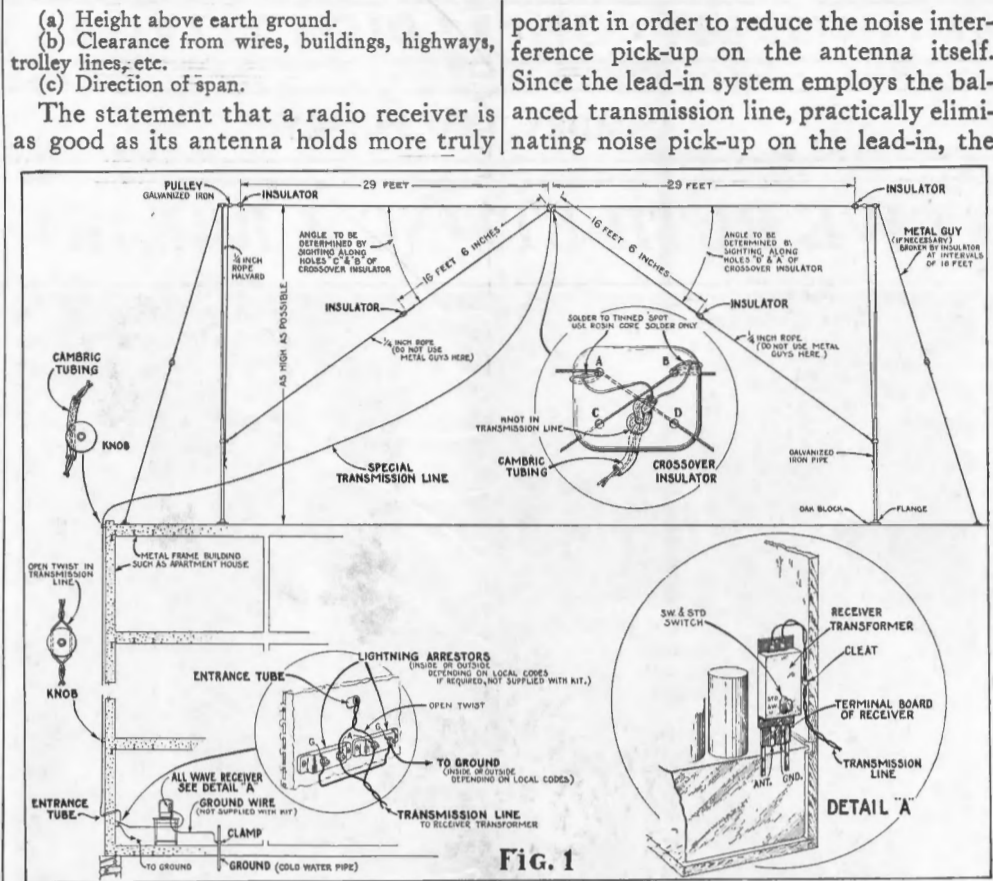
By studying Figure 1 it will be seen that, in reality, there are installed between the two supporting poles two distinct doublets—one doublet having 29 feet for each half section, and the other, 16½ feet for each half section. The purpose for this arrangement is to approach an ideal antenna system for all the short-wave broadcast bands. Theoretically it would be best to have a doublet designed and installed for each band, namely, one each for the 16, 19, 25, 31 and 49 meter bands. This would mean five doublets, and each one should be sufficiently separated from its neighbor to prevent disturbance of the reception. Obviously this would be quite an installation problem and economically prohibitive. Therefore the arrangement shown in Figure 1 is the best approach to the ideal, as the 29-foot sections tend to tune or match the system toward the lower end (in frequency) of the short-wave broadcast band, namely, toward 49 meters, and the 16½-foot sections tend to tune or match the system toward the higher end (in frequency) of the short-wave broadcast band, namely, toward 16 meters. The connection of both doublets, or the "double doublet," to the transmission line, tends to give a smooth transition throughout the short-wave broadcast band.

Determination of the proper lengths for each doublet made from the two continuous antenna wires, each 46½ feet long (6" allowed for each antenna strain insulator tie), is readily made by observing the tinned spot on the wire. Connection of the transmission line should be made to this spot by rosin core soldering as indi-



cated by the detail of Figure 1. Note that the long and short antenna wires, which are connected together, are located on opposite sides of the center transmission line connection.

When installing the antenna wires proper (two lengths of 46½ feet stranded wire), there should be kept in mind the following important considerations:



for short-wave or all-wave receivers than broadcast receivers.

### Height Important

(a) Height above earth ground is a most important consideration with the antenna construction of Figure 1. Height above ground should be considered as the distance from the 29-foot horizontal sections to ground, the latter to be considered as earth ground if the span is on top of a frame dwelling with no grounded metal roof, or from a building to a nearby pole, tree, or another building. If the span is installed on top of a steel framework building, or any building with a grounded roof, the earth ground is usually considered at the roof.

For good results a minimum of 30 feet above ground is recommended. The signal strength received varies with the height above ground.

### Clearance From Wires, etc.

(b-1) Clearance from wires and buildings is necessary so as to prevent these objects from casting radio shadows on the antenna system with consequent reduction in signal strength pick-up.

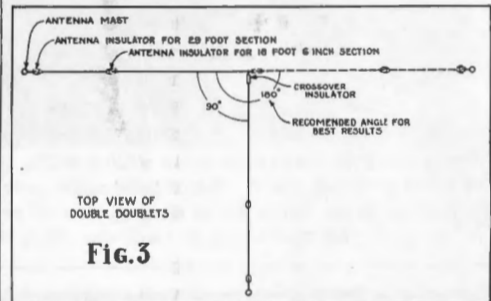
(b-2) Clearance or distance from wires, buildings containing electrical machinery, highways, trolley lines, etc., is very im-

portant in order to reduce the noise interference pick-up on the antenna itself. Since the lead-in system employs the balanced transmission line, practically eliminating noise pick-up on the lead-in, the

obvious advantages of the use of the kit are readily seen. The antennas may be erected as far away as 500-foot-run of transmission line from the receiver if necessary. This is further explained under the section describing the transmission line.

### Direction Important

(c) The direction of the span for best results is that direction having the double doublet antenna placed *broadside* to the direction from which it is desired to receive. This direction of the span for best results is shown by Figure 2.



Theoretically, the doublet should be stretched out fully—each half making an angle of 180 degrees with the other, as shown in Figures 2 and 3, for most efficient reception. If this angle is reduced, due to constructional difficulties to 90 degrees, as shown in Figure 3, signal strength will be decreased about 30 per cent from the signal received from the doublet in its full 180-degree span.

The special antenna cross-over insulator of high-grade porcelain, supplied, has been designed to separate the doublet antennae and provide support for the transmission line, as illustrated in detail in Figure 1.

Four antenna strain insulators of high-grade porcelain are supplied for efficiently insulating the ends of the doublets as shown in Figure 1.

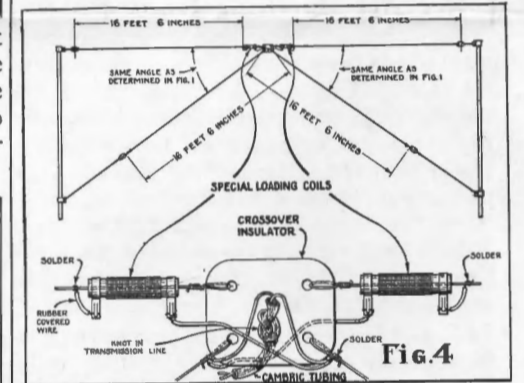
When connected to the transformer (and transformer connected to receiver) the transmission line is balanced to ground and eliminates or reduces to a minimum noise interference pick-up on the lead-in system.

### Use Total Length

The total length supplied must always be used regardless of the doublet antenna system is only, for example, 60 feet of line run from the receiver location. The balance of 50 feet may be coiled up in a coil of convenient diameter, such as one foot, at the receiver end.

The connection of the conductors to the receiver transformer is immaterial so long as the ends do not short.

For distances greater than 110 feet, additional length of line must be added in multiples up to two (2) times, or up to 220 feet. After this distance additional lengths can be added up to 500 feet and



can be cut anywhere convenient for connection to receiver.

### Examples:

Line Run to Receiver from Doublet In Feet	Line Length Used In Feet	Number of Lengths of 110 Feet	Length to be Coiled In Feet
95	110	1	15
150	220	2	70
210	220	2	10
300	300	3	No coil necessary. Cut off unused portion if desired.
500	500	5	

(Continued on Page 3)

# RCA World-Wide Antenna Kit Comes Attractively Packaged

"A product in an attractive package is half sold" is an old merchandising maxim.

In line with this principle, the RCA World-Wide Antenna Kit comes in a neatly labeled two-color carton. Its proper place is on top of the counter or in a prominent position on the store shelves, not underneath the test bench. The striking appearance of the package will catch the prospect's eye and elicit many an inquiry. After that it is not hard to sell him on the need for a scientific antenna system.

Packed with each RCA World-Wide Antenna, in addition to the instruction booklet, there is an impressive "Installation Certificate" which assures the

customer that the antenna installed in his home is according to RCA speci-

fications and utilizes genuine RCA essential parts. By using a little ingenuity in erecting a miniature antenna system in the window, and displaying the cartons and Certificate of Installation, a real selling window display is assured.

The contents of the Kit for the RCA World-Wide Antenna System are:



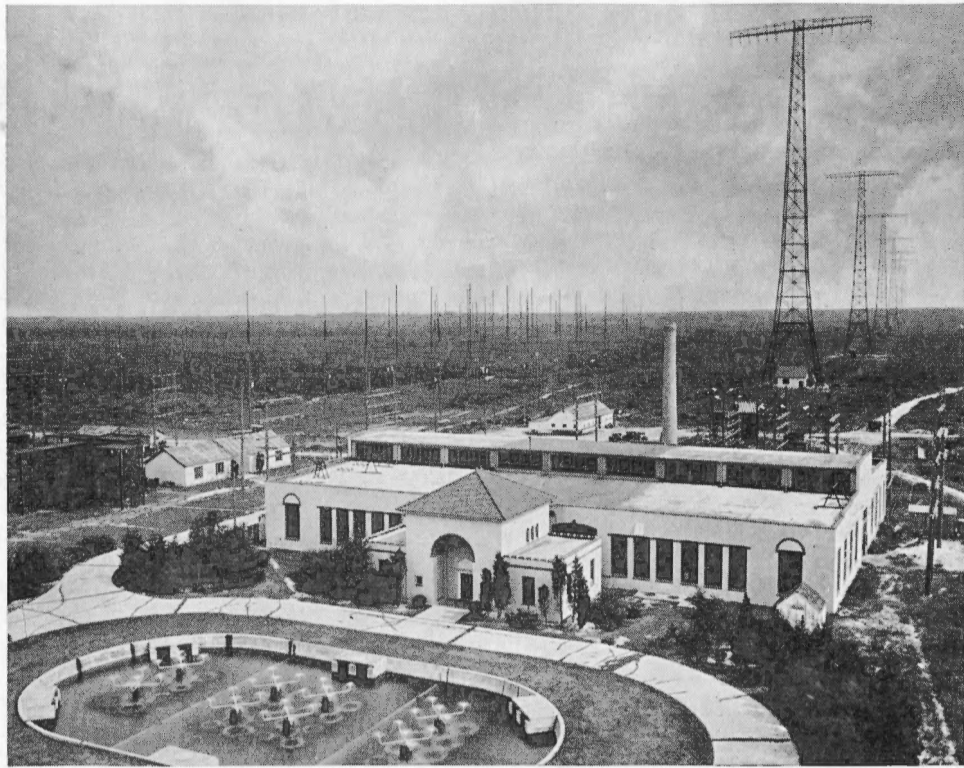
The List Price is \$7.00 per Kit

A standard shipping package contains 10 kits

Each Antenna is packed in a Merchandising Container

- 1 Special Receiver Matching Transformer and Switch.
- 110 Feet Specially Developed Transmission Line.
- 2 Lengths of 46½ feet of stranded Antenna Wire for doublet construction.
- 1 Special Antenna Crossover Insulator.
- 4 Antenna Strain Insulators.
- 1 Lead-in Insulator.
- 2 Transmission Line Insulators.
- 1 Ground Clamp.
- 1 Transmission Line Cleat.
- 2 Pieces of Cambric Tubing.

# The "Big Brother" of the RCA World-Wide Antenna System



RCA's "Radio Central" at Rocky Point, Long Island, showing part of the elaborate antenna systems designed by RCA engineers for sending and receiving transoceanic messages

## Antenna Installation

(Continued from page 2)

Additional 110-foot lengths of the special transmission line may be procured separately on request.

To efficiently insulate the transmission line from the side of a building and permit proper entrance, the two porcelain knobs and a porcelain tube are supplied. Two pieces of cambric tubing for protecting the transmission line are supplied. Their use is illustrated by the details of Figure 1.

### Receiver Matching Transformer

The matching transformer is a specially developed unit necessary to couple the transmission line to the receiver, as well as by its design and use of electrostatic shielding to balance out the transmission line to ground.

The transformer is designed to mount directly on the Antenna-Ground terminal board of RCA Victor All Wave Receivers, such as Models 140 (late production only), 240, 120, 121, 320, and 321, thereby insuring the shortest possible connection to the antenna and ground terminals. The installation of the transformer to a late-production RCA Victor Model 140 is illustrated in Figure 1. *It is important to note that the length of the ground connection of the special transformer is critical. To insure maximum noise reduction keep this connection at shortest possible distance (not over one inch) from chassis ground.* On early-

production models of the RCA Victor 140, terminal No. 1 (grounded to chassis) of the Phonograph Terminal Board, located at rear of chassis, should be used for getting this important short ground connection for this model. By utilizing this terminal easy mounting of the transformer is obtained. Care should be exercised to prevent the transformer antenna terminal from shorting to the chassis. On other manufacturers' receivers, having the chassis grounded, the transformer should be mounted on the side of the cabinet (by utilizing holes, spacers and screws provided) in such a manner as to permit having the transformer ground connector, when bent, slip under the ground terminal or a chassis nut. If this is not possible make the ground connection *absolutely as short as possible.*

### Antenna Connection

The length of the antenna connection of the transformer is not as critical as the ground, in so far as noise reduction is concerned. However, this connection should be kept as short as convenient and close to chassis—free and away from grid leads of the receiver radio tubes.

Ground wire should be obtained locally, as lengths for ground wire will vary. Use No. 14 RC wire or larger, if possible, and keep the run as short as possible.

### Other Suggested Methods

It is possible that due to constructional difficulties the full length of the antenna span of approximately 60 feet cannot be obtained without decreasing the angle from 180 to 90 degrees, as shown in Figure 3. Another arrangement is to use specially developed loading coils to permit reduction of the antenna span to approximately 34 feet. This is illustrated in Figure 4. The two loading coils necessary are *not* supplied with the standard kit and should be ordered separately as RCA Stock No. 6958 (one pair), \$0.60 list price.

### Vertical Doublets

Due principally to the non-directional receiving ability of a vertical doublet, it may be said that the vertical doublet is sometimes superior to the horizontal doublets shown in Figure 1. On the other hand, the horizontal doublets will usually give a better signal to noise ratio. However, a vertical doublet having similar characteristics to the doublet of Figure 1, would require a support such as a wooden pole or frame house of at least 60 feet above the ground. Such a support is not readily found and is expensive to construct.

However, for those interested, the arrangements of vertical doublets, illustrated by Figure 5, utilizing the loading coils, RCA Stock No. 6958, to shorten the vertical height, are suggested. It may be found that in some locations a vertical doublet, the type shown in Figure 5, may be easier to install.

### Precautions and Suggestions

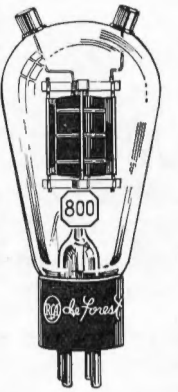
On RCA Victor Model 140 All-Wave Receiver it will be found that connections of the receiver matching transformer tends to throw the antenna circuit for band "D" out of alignment. This should be checked in the usual manner by use of the tuning wand and realigned with the Range Switch at "D" and the Station Selector turned to the 25-meter band. If no station or oscillator signal can be used, use background noise as a basis of line-up.

It will be noted that on most converter type of short-wave receivers, such as RCA Victor Universal Radiola RO-23, the use of this kit and matching transformer reduces serious cross-modulating effects from near-by code, airport or amateur stations. This is an obvious advantage and owners of these type receivers will welcome the installation of this kit.

In tests it has been noticed that stray wires, such as other antenna wires, re-radiate noise interference picked up at some remote point, demonstrating the need to keep the doublet antenna system away as far as possible from such wires.

In order not to affect the receiving qualities of the antenna system, use wood poles and rope guys wherever possible. If guy wires are necessary, lengths of over 16 feet should be broken by insulators, one for every 16 feet.

# Amateurs Welcome RCA-800 Tube



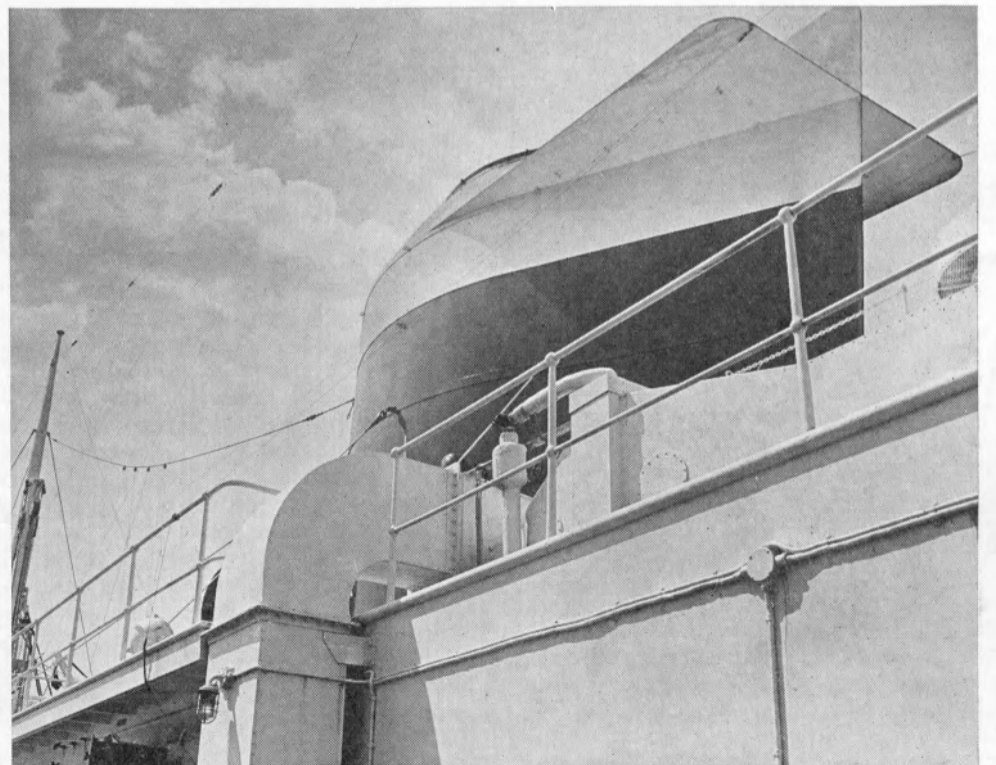
Radio amateurs have long needed, and wanted, a medium-power transmitting tube capable of giving full output at the commonly used amateur frequencies. The laboratory of the RCA Radiotron Company completed the development of the RCA-800 last Fall. Upon its introduction, the RCA-800 was immediately accorded a widespread popularity, so that today, after only a few months, this tube is the most popular amateur type in its power class.

RCA-800 is a new three-electrode transmitting tube for use as a radio-frequency power amplifier, oscillator, and Class B audio-frequency amplifier or modulator. In radio-frequency service, it may be used at frequencies as high as 60 mc. (5 meters). It may be used at frequencies as high as 200 mc. (1½ meters) with reduced input. The grid and plate leads of this tube are brought to metal caps at the top of the bulb, thus insuring high insulation and low capacity between leads. As a Class B modulator two RCA-800's will modulate 100 per cent, approximately 200 watts of power to the modulated r-f amplifier. Filament volts, 7.5. Normal plate volts, 1000. Nominal power output (Class C telegraph service), 50 watts.

## Don'ts—9 of 'em—When Installing Auto Radios

1. Don't start work until you have read all of the manufacturer's instructions.
2. Don't neglect to follow the owner's wishes in choosing the set location.
3. Don't forget to advance the charging rate. A good rule for average driving is to set the generator so that at 40 miles per hour there is no charge or discharge with all driving lights burning and the radio "on."
4. Don't forget to make any circuit change necessary for the polarity of the battery ground. This is covered in detail in the instruction book furnished by the manufacturer.
5. Don't forget to install the suppressors and capacitors as recommended in the instruction book. Suppressors on all spark plugs and on distributor. Capacitors on the ammeter and generator.
6. Don't forget to ground the end of the antenna lead shield to the car frame. Also make sure that the shield covers the antenna connector and that the clamp supplied is in place. This is very important to eliminate all ignition noise.
7. Don't expect to clear up ignition noise if the electrical system of the car is in poor condition. Leaky high-tension wiring, faulty connections to lights, pitted breaker points, uneven distributor rotor points will cause noise. The only remedy is to put the electrical system in good condition. It is well to point this out to the customer before you start the job.
8. Don't forget that cars having wooden toe-boards require a grounded metal screen to be fastened underneath the toe-board. This prevents radiation by the person sitting beside the driver.
9. Don't forget to phone your customer a week or two after the installation is made to make sure the set is operating satisfactorily.

## RCA Antennae on Fast Ocean Liners



Since the early days of radio, RCA radio operators and RCA installations aboard ship have made maritime history. Above is shown the antenna of the RCA equipment aboard the S. S. Santa Paula

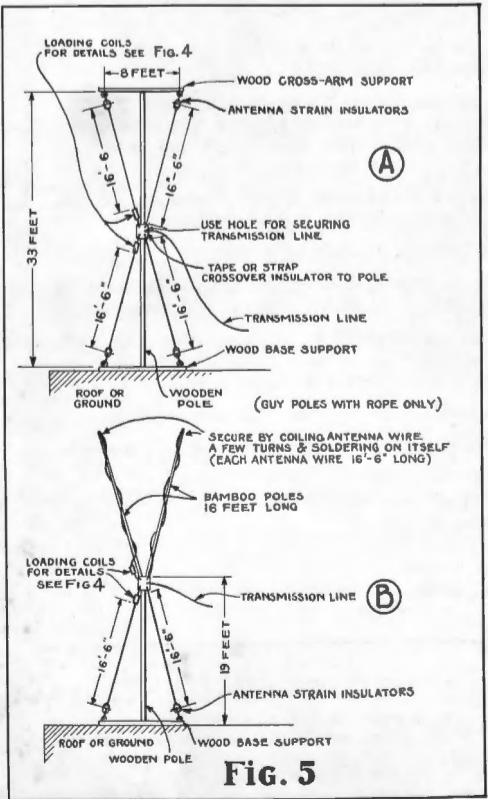


Fig. 5

## RADIO SERVICE SALES ENGINEERS

(Continued from page 1)

the future on a firm foundation, the foundation of quality and service to the public at the right price.

The same ruthless competition that has done so much harm to the industry has also done much good. It has eliminated many of the members of the industry who were poorly trained, inefficient, and in some cases unscrupulous.

**The process of elimination will go on. Those who have survived and will survive will be something more than mere "handy men about radios." They will be respected and highly trained radio engineers, but they will also be sales engineers. In the fullest sense of the word, they will be business men—RADIO SERVICE SALES ENGINEERS.**

As business men, radio service sales engineers will be able to operate their businesses on the only sound basis, *honest value for honest prices*. And the sooner everyone in the industry adopts this principle, the better for all concerned, including the public. Only then can public confidence be restored.

**The radio service industry has no reason to hesitate to charge honest prices. Certainly, at the present time, honest prices are higher prices, high enough to return a profit and low enough to attract a volume.** It is better to lose a job than to take it at a loss, at a price based on some other fellow's price rather than on cost of doing business.

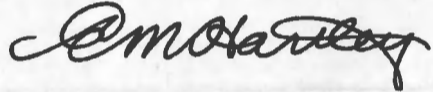
There has been too much chiseling all down the line. The customer has chiseled the radio service man, forcing him to chisel his supplier, and the supplier chiseled the manufacturer. From this situation only demoralization, poor quality and profitless prices could result.

**It is high time for an about-face. The goal of profitable prices will be reached only by earning the public's confidence. The public has confidence only in quality.**

There must be quality in the diagnosis of radio troubles, quality in radio parts, quality in radio tubes, quality in radio service work, quality in the business methods employed, and the prices charged must be based on quality.

As a quality business radio service will become a profitable business. The public will gladly pay higher prices for higher quality and better methods.

**RCA RADIO SERVICE NEWS hereby pledges itself to the principle that radio service sales engineers are entitled to higher prices for higher quality materials, work and service.**



Manager, RCA Parts Division

## BOOM IN ANTENNA BUSINESS FORECAST BY TRADE PAPER

A tremendous boom in the business of installing efficient all-wave antenna systems is forecast by M. C. Clements, Business Manager of *Radio Retailing*.

Mr. Clements said: "Disregarding the older all-wave receivers, which were not entirely satisfactory, there are now in use approximately 125,000 all-wave sets. These have all been sold since last July. If there are not a million and a half all-wave receivers in this country by next January 1, the cigars will be on me. All, or practically all, of them will require a special all-wave antenna. What a market!"

Assuming that only one-third of the owners purchase special antenna systems, there will be a market for a half-million

installations. With a list price of \$7.00 for the RCA World-Wide Antenna System and, assuming an average of \$5.00 additional for the installation charge, this represents a \$6,000,000 market for radio service sales engineers.

A good antenna is not of vital importance in regular broadcast reception, for usually the radio-set owner can find all the programs he wants within a radius of 200 miles. In the short-wave band, however, the situation is quite different—it is often necessary to reach out from 5,000 to 15,000 miles for a program. Satisfactory short-wave reception is impossible without a good antenna system.

Thus the market is actual rather than "potential." If automobiles were sold without tires, dealers would have little difficulty selling every purchaser of an automobile a complete set of tires, because there is no satisfaction in a car without tires. Similarly, there is little satisfaction in a short-wave set without an antenna capable of picking up the weak short-wave signals and supplying them to the receiver with a minimum of noise.

No short-wave or all-wave set should be sold without a special antenna system. To do so is to invite trouble, for, in nine cases out of ten, the customer is dissatisfied with the set's performance and knocks short-wave radio to his friends. On the other hand, the more all-wave sets that are properly installed, the more all-wave sets will be sold.

The average all-wave receiver sells for about \$60.00. By selling a Certified Installation of the noise-reducing RCA World-Wide Antenna along with the set, the dealer increases his unit of sale by 20 per cent and insures future sales of additional sets by making a satisfied short-wave customer.

## SEALED REPLACEMENT VIBRATOR SIMPLIFIES AUTO SET REPAIRS

To simplify repairs to the RCA Victor M-34 Automobile Receiver, RCA Victor has developed a special sealed replacement vibrator.

The proper adjustment of vibrators of this type is dependent upon laboratory equipment of advanced design. Therefore, the Replacement Vibrator is sealed at the factory to insure proper adjustment and freedom from tampering. High efficiency, long life, and wide input voltage range are inherent features of this vibrator.

Radio service sales engineers will find that the sealed replacement vibrator makes repairing the Model M-34 an easy job and insures a satisfied customer. The Stock Number is 7604 and the list price, \$5.00 per vibrator.

## Codes Benefit Industry, Public

Eventual stabilization on a profitable basis of the radio service industry is indicated by the rapidity with which radio service sales engineers are organizing.

From all parts of the country comes news of new service organizations and the gaining of new recruits by the old organizations. A number of small local associations which until recently lacked influence because of small membership now embrace the majority of the members of the business in their respective cities.

The Institute of Radio Service Men, with headquarters in Chicago, during the past twelve months has added many chapters. An aggressive campaign is now under way by the Institute to educate the public to the need of radio service and the important contribution that radio service engineers make to their radio enjoyment.

Proof that an organization can protect the public as well as foster better ethics and more profitable competitive conditions for radio service sales engineers is shown by the Code of Fair Competition proposed by the radio service organization of Dallas, Texas, which is reproduced below. Similar codes are under consideration in other cities.

## RCA Auto Antenna an Aid to Sales

### RCA Roof Aerial Has Big Profit Possibilities

A proper antenna installation is one of the problems encountered by service engineers when installing automobile radio receivers. It is true that at present many cars are coming through from the factory with the antenna already installed. However, there are times when the results obtained from one of these installations cause one to suspect its efficiency. There were many cars manufactured before an antenna was standard equipment. The RCA Auto Roof Antenna offers service engineers an opportunity to take care of both of these conditions.

The antenna is composed of No. 23 gauge, single-cotton-covered soft copper wire, covered with book-cover paper, size 36 inches long by 24 inches wide, fitted with six curtain-type pin-hooks for attaching, thereby precluding removal of fabric. Six eyelets are pierced into sides of antenna. As furnished, the antenna is equipped with a sufficient length of lead-in wire ready attached. The paper covering is procurable in "gray" (7622) or "tan" (7621) finish. The low list price of \$1.50 makes the RCA Auto Roof Antenna distinctly salable.

## CODE OF FAIR COMPETITION GOVERNING

### Radio Dealers and Servicemen

1. It shall be unethical for any member of the profession to criticize any other member in any way.
2. Minimum charge for estimates made on the repair of radios brought to the shop shall be \$1.00 for thirty minutes or less; excess of thirty minutes shall be \$1.50 per hour, same to be applied to the credit of the customer in event repair is authorized. (Definition: Inspection in the shop is to be defined as applying to any radio chassis or apparatus, exclusive of tubes, entering the shop.)
3. Minimum service charges for estimates on repairs, or repairs made in the home, shall be \$1.50 for thirty minutes or less. Excess of thirty minutes shall be \$1.50 per hour, \$1.00 of which charge shall be credited to the customer in the event repairs are authorized within fifteen days.
4. When a serviceman enters the location of a radio on call, entrance shall constitute a service call.
5. All parts, tubes and accessories shall be sold to the retail trade at list prices. When possible, manufacturer's original replacement parts are to be used or equivalent; when not possible, substitution must be explained to customer.
6. Each and every service shop must employ at least one qualified radio serviceman.
7. Qualified radio serviceman shall be defined as one who has been examined or licensed by a recognized authority.
8. Maximum hours of labor for radio servicemen and apprentices shall be forty hours per week or eight hours per day.
9. Minimum allowance for motor car mileage shall be eight cents per car mile, to be paid by the shop owner to the radio serviceman required to furnish his own transportation.
10. No employed technician shall indulge in independent service work on the side; all radio service work that he does shall go through the regular business channels of the concern that employs him.
11. No radio service shall be done, regardless of the identity of the customer, at less than the minimum retail price.
12. All radios shall be installed by qualified technicians or under such supervision in accordance with the National Fire Underwriters' code.
13. It shall be unethical to make rebates, trade-ins or agreements dealing with the sale of merchandise or service which are calculated to give the customer equivalent of less than list price. Tubes and parts shall have no trade-in value.
14. It shall be unethical to make more than one estimate on any one repair job unless there shall have been an honest mistake in the first instance.
15. It shall be unethical to use competitive bids as a basis of bidding.
16. It shall be unethical to use parts, tubes or materials which are reclaimed or second-hand, except with the specific consent and knowledge of the customer.
17. It shall be unethical to misrepresent merchandise or service through any advertising medium, word of mouth or otherwise which will intimate intention to cut prices; misleading statements shall be considered unethical.
18. The ratio of apprentices to servicemen shall be no more than one-to-one.
19. All inspection of radio equipment on the bench or in the home shall be made by qualified radio servicemen.
20. Minimum prices governing automobile radio service shall be:
  - a. Installation of single-unit radios, \$4.00.
  - b. Installation of double-unit radios, \$5.00.
  - c. Installation of car top antenna, \$4.00.
  - d. All other service work, \$1.50 per hour.

CODE OF FAIR COMPETITION PROPOSED BY THE RADIO SERVICE ORGANIZATION OF DALLAS, TEXAS. NOTICE THE PROVISIONS FOR THE PROTECTION OF THE BUYING PUBLIC.

# Cathode-Ray Tubes Will Soon Be a Vital Part of Service Bench

*Many Interesting Applications in the Testing of Radio Circuits*

Of more than passing interest to all radio service sales engineers is the recent commercial announcement of four Cathode-Ray Tubes by RCA Radiotron Company, Inc. Cathode-Ray Tubes have many interesting applications in testing apparatus, not only in the radio field but in practically every industry where electrical circuits can be used for testing and measuring purposes.

Extremely interesting detailed articles on the practical application of the Cathode-Ray Oscillograph for amateur radio stations have recently appeared in *QST* Magazine. March, 1934, *QST* carried an article, "A Practical Cathode-Ray Oscillograph for the Amateur Station" by L. C. Waller, W2BRO. In the April issue of *QST* was an article by James Millen, W1HRX, and Dana H. Bacon, W1BZR, entitled "A Simple Cathode-Ray Oscilloscope." RCA engineers are now working on methods of utilizing the Cathode-Ray Tubes in the testing of radio circuits, with particular reference to the work of radio service sales engineers. A detailed article on this subject will appear in a forthcoming issue of *RCA RADIO SERVICE NEWS*.

Some of the interesting characteristics of the Cathode-Ray Tubes and the two supplementary types are given below. All the designs have been carefully chosen to meet the diversified needs of oscillograph application. The types are: RCA-904, RCA-905, RCA-906, RCA-878, and RCA-885.

## RCA 878

RCA-878 is a high-vacuum, half-wave rectifier of the hot-cathode type for use in suitable devices to supply the d-c voltage

requirements of cathode-ray tubes. Filament volts, 2.5. Maximum peak inverse volts, 20,000. Maximum d-c load current, 20 milliamperes.

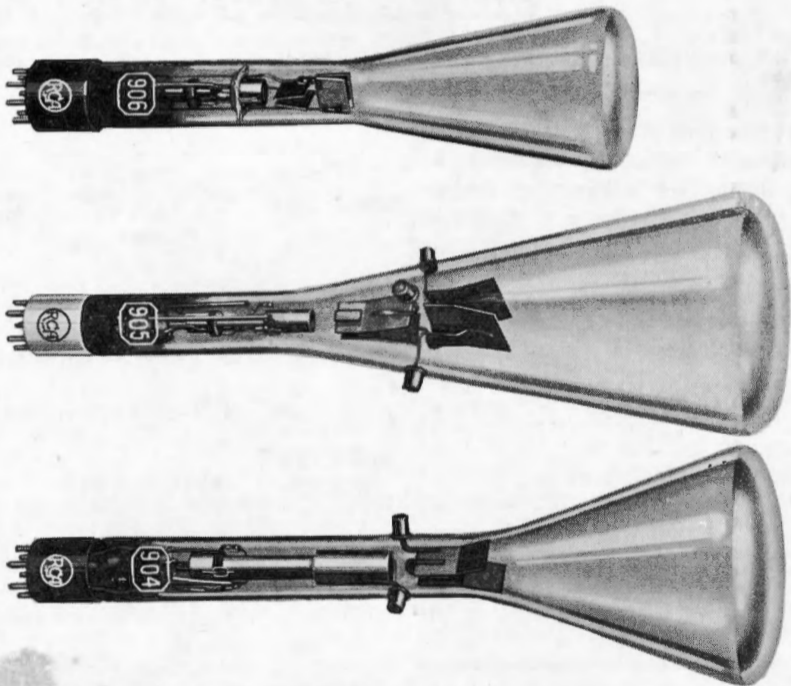
## RCA 885

RCA-885 is a grid-controlled, gaseous-discharge tube of the heater-cathode type. It is designed for use as a sweep-circuit oscillator in cathode-ray tube oscillograph circuits. It also may be used as a grid-controlled rectifier. Heater volts, 2.5. Maximum peak plate volts, 200. Maximum peak plate current, 300 milliamperes.

## RCA 904-905-906

RCA-904, RCA-905 and RCA-906 are high-vacuum cathode-ray tubes with fluorescent viewing screens, having diameters of 5 inches, 5 inches, and 3 inches, respectively. The electron source of these tubes is a heater-cathode. The electron source, control electrode, accelerating electrode, and focusing electrodes constitute an electron gun used for projecting a beam of electrons upon the fluorescent

screen. The resulting luminous spot, easily visible in a brightly lighted room, can be regulated as to size and intensity by a suitable choice of electrode voltages. These tubes are well suited for the observation and photography of recurrent and transient wave forms.



## YOU ASK 'EM—WE ANSWER 'EM

*If you have any questions on Radio tube operation or application, send them to the editor*

**Q. Why do the glass bulbs of most receiving tubes have a silvery appearance?**

A. The silver-like appearance on the inside of many tube bulbs is due to condensed "getter" vapor which is volatilized during the evacuating process. After the atmosphere has been drawn from the bulb by highly efficient pumps, this "getter" is exploded to gather and retain, during the life of the tube, residual occluded gases.

**Q. Should the screen current be considered when calculating the value of a cathode resistor for a screen-grid detector tube used as a non-regenerative detector?**

A. When computing the value of a cathode resistor of a screen-grid detector, the screen current may be neglected because it is but a small fraction of the plate current, which itself is very small.

**Q. I have wired up a Class A audio-frequency amplifier to use two 2A5's in push-pull, at a plate voltage of 250 volts under the corresponding operating conditions. How much input signal voltage is necessary to drive the amplifier to full output?**

A. The bias voltage of a tube is an indication of the peak signal required for full output, provided all circuit requirements have been fulfilled. The bias of the 2A5 at 250 volts on the plate is -16.5 volts. Therefore, the peak signal value required is 16.5 volts. Since the push-pull connection requires twice the signal input voltage of a single tube, the peak value is  $2 \times 16.5$  or 33 volts, as measured from grid to grid. The RMS value (the value that is

measured on an a.c. voltmeter) is  $.707 \times 33$  or 23.3 volts.

**Q. What are the advantages of dome-top bulbs?**

A. The top mica support of the electrode assembly fits snugly into the dome of the bulb to brace the tube's structure against mechanical displacement. In addition, the increased strength of the electrode assembly lends itself to simplified construction by eliminating many welds and parts. The resulting increase in uniformity of tube characteristics permits the design of receivers with closer tolerances and consequently better performance.

**Q. Why is the 38 becoming popular in small receivers where comparatively high voltage is available for plate supply?**

A. Improved materials and methods of construction used for the 38 have permitted an increase in the maximum plate voltage rating to 250 volts, as compared with the former rating of 135 volts. This new rating increases the power output of the tube from 0.55 watt to 2.5 watts. The 0.3 ampere heater current rating of the 38 makes it convenient to operate this tube in series with heaters of other 0.3 ampere heater types without the use of auxiliary resistors.

**Q. Which type of detector tube gives the greatest fidelity on all received signals?**

A. The diode and duplex-diode detectors using either the half-wave or full-wave connection. The internal resistance of such tubes is very low, so that good fidelity can be obtained with a practical value of load resistance.

**Q. Which type of detector is the most sensitive to received signals?**

A. A grid leak and condenser detector. Screen-grid and triple-grid tubes, such as the 24-A, 57 and 77, respectively, are particularly sensitive when used for this service, although triodes may also be used satisfactorily. Grid-leak and condenser detection gives best results on weak signals, but has the disadvantage of overloading on strong signals.

**Q. Can the mercury-vapor rectifier 83 be used in receivers designed for the 80?**

A. In general, this substitution is not desirable. One ill effect is that such sets, particularly when operated in a sensitive condition, become noisy. This trouble is not encountered in sets designed to use mercury-vapor rectifier tubes. In addition to this effect, the higher output voltage delivered by the 83 may adversely

affect the operating conditions of the receiver and cause unstable performance, together with added strain on the filter and by-pass condensers. The increased filament current of the 83 may also overload the rectifier filament winding in some sets. To obtain the full advantage of mercury-vapor rectifier tubes, receiver design must be co-ordinated with the characteristics of such tubes.

**Q. During experimental work with the phototube 868, I have observed that it glows under certain conditions of operation. What is the cause, and is such an effect harmful to the tube?**

A. The tube is glowing because it is probably overloaded, either from excessive anode voltage or from intense light on the cathode. Such a condition is detrimental to tube life and performance. The maximum rated anode voltage and current should never be exceeded.

## Proud of Your Service Bench?

**Send Us a Picture—Win a \$10 or \$5 Prize!**

What radio service sales engineer has not invented some new gadget or idea to make the service bench more convenient and efficient? Almost every radio service engineer is convinced that the service bench of his own design is the last word in design. An amazing amount of ingenuity—to say nothing of loving care—has been lavished on radio service benches.

So that you may compare your service bench with others, *RCA RADIO SERVICE NEWS* offers, until further notice, two prizes each month for photos of service benches published in this magazine. First prize, \$10.00; second prize, \$5.00.

The only requirements are that the photo be suitable for reproduction and that it be accompanied by the name and address of the sender, and a short description of the equipment shown and the features of the bench that you consider especially desirable. Clear snap-shots will do; glossy prints are best for reproduction.

Send your photo to *RCA RADIO SERVICE NEWS*, Camden, New Jersey.



PHILLIPS LORD, OF SETH PARKER FAME  
Equips his RCA Victor Radio Set with RCA Cunningham Radiotron Tubes for his round-the-world trip.

## Requests for Factory Engineers Indicate Distrust of Local Talent

Set owners are constantly writing to the RCA Victor Company, asking either that a factory representative be sent to service their sets, or that they be permitted to send their sets in for a factory inspection and overhauling.

"May I send my radio receiver to the factory for an overhaul by your workmen?" writes a typical owner. Another says, "Will you send one of your engineers to my home? Do not refer me to a local service man."

No conscientious radio service sales engineer can afford to ignore this attitude. Already prevalent, it may develop into a serious menace to his livelihood. Some definite suggestions that, in our opinion, will do much to counteract the distrust by the public of the local service men, however competent he may be, are given herewith:

**A factory engineer inspires confidence by his appearance.** You can inspire confidence by your appearance. Our men do not make service calls wearing a silk hat, spats and a cane, but their clothes are brushed, shoes polished, hands washed, hair cut, and they shave daily.

Our engineer carries a test kit, oscillator and a bag of tools. They are kept clean and bright. The tool bag, when opened, presents an orderly appearance. Do you carry the same equipment? If you do, what do you do with it? Do you plug in your soldering iron and leave it on the floor while it is heating so that it either burns a hole in the rug or marks the hardwood floor? Do you solder so that little specks fall, fasten to the rug and stay there for weeks to remind customers of your call? Do you have an orderly procedure for locating trouble, or do you mess around and poke things, hoping that you will find the answer?

### Be Thorough

A good service man will check the ground to make sure it is a good one, test the antenna for a ground against the cornice, gutter or roof and measure the line voltage before he touches the receiver. By doing this, he is sure that the trouble apparently is not outside the receiver. A check of the receiver with the analyzer then shows whether each particular socket is receiving the proper voltages and current. So far, nothing has been taken apart or strewn around the floor.

Some men prefer to remove equipment rather than work on it at a customer's home. It is not always possible to do this. Certainly it adds nothing to their confidence to see the equipment for which they paid \$50.00, \$100.00 or \$200.00 spread all over their floor. Your test equipment has given the customer a logical reason for the work to be done. Half of a doctor's cure lies in the effect of the bag he plumps on the floor when he sits down at your bedside and starts to take your pulse.

### Use Factory Tested Parts

Keep your tubes in the containers supplied by the manufacturer. They spent a lot of money doping out sales appeal on the carton so that the customer will say "Gimme" when you show it to him. Parts, too, at least RCA VICTOR FACTORY TESTED PARTS, have a distinctive packing. It convinces your customer that you are delivering to him the same unit which the manufacturer intended for his receiver.

Suppose that you are forced to make the repairs in the customer's home. Do you dump your tool bag upside down on the rug? What comes out? A few bolts and nuts, a couple of hunks of ribbon solder, a

transformer with a burnt-out winding, a "kluck" tube, a battered screw driver and a pair of gas pliers? Remember the inside of the doctor's bag with all the pills in neat little rows of bottles? It doesn't cost you much to doll up your tool bag.

### A Good Front Counts

"What is the sense of going to all this fuss over a few tools?" Front, Brother, Front! "You can't get the tools a factory engineer has?" The heck you can't! Any RCA Victor Distributor or Replacement Parts Distributor can get you any tool supplied a factory engineer. You don't have to have them to do a good job, but they do make your work easier, and help you to make more calls in a given length of time. Not only that, but when the customer watches you select one from your roll or board and you make an adjustment quickly and easily, you are backing up the impression created by your test equipment.

If a receiver needs alignment, do you tune in a local station, go around in back of the cabinet, and start monkeying with screws while the speaker emits groans, grunts, burps, howls, and squeals? Or do you use an oscillator and an output meter? The oscillator lifts you out of the family physician class and identifies you as a specialist.

Being a service man instead of a "tube changer," you have not been smoking cigarettes, spraying ashes around the place or parking one on the piano or the top of the cabinet. Since you have spread a cloth or a newspaper on the floor when you worked on the receiver, there are no loose bits of solder, odd screws, or other debris cluttering up the room.

### Destroy Old Parts

At the same time, any tubes or parts which have been replaced, have been turned over to the customer and tested in front of him with your test equipment so that he knows definitely that they needed replacement. By doing this you have eliminated any idea that the parts were merely changed to give you a chance to make your bill larger. Then, ask permission to destroy the parts and throw them in the customer's trash bin, so that there will be no danger of using the tube or unit again by mistake. The customer is then sure that you do not intend to use them elsewhere.

Because your test box, oscillator, and tools have permitted you to work quickly, competently and quietly, the impression has been created that you knew what you were doing and did it well. Do you believe a factory engineer could have done it better? If the customer does—who is responsible?

## A HANDSOME PIGSKIN WALLET FREE FOR SERVICE IDEAS

Future issues of RCA Radio Service News will carry a column devoted to the time and trouble saving ideas discovered by our readers in the course of their work. For each idea accepted and published, a handsome RCA Radiotron Pigskin Wallet will be given free.

If you have ever seen one of these wallets, you will want one. They are size 4¼ by 6½ inches when folded. When unfolded there are two letter-size compartments and one small pocket for business cards, etc.

Ideas may be on any phase of radio service work and may apply to any make of receivers. State your idea as clearly and concisely as possible and send it to RCA Radio Service News, Camden, New Jersey. Write your name and address clearly so that you will be sure to receive the wallet if you win one.

## Quality Pledge Promotes Business

### Dealers Find Square Deal Pledge Effective in Advertising

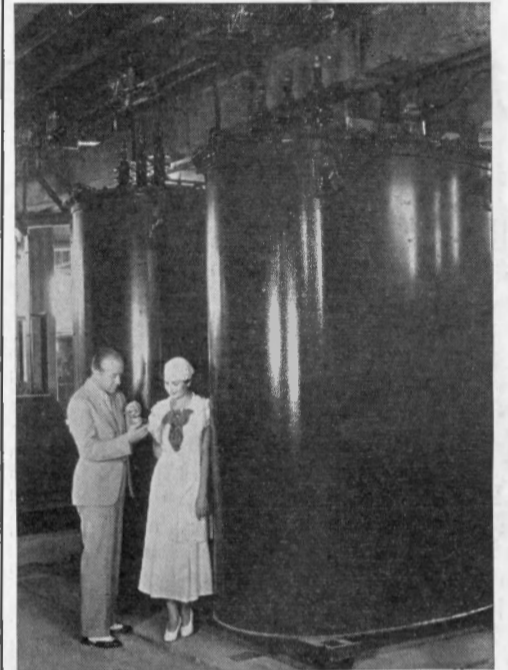
That the public appreciates honesty and sincerity from the radio service profession is proved by the continued popularity of the message which was first used on a display card given service stores by the RCA Radiotron Company, Inc.

Starting off with the words, "In our service work we pledge," the card assured the public of a square deal in six simple promises. The sincerity of the message impressed the public, who responded with their business.

A considerable number of radio service sales engineers found the use of the pledge so effective that they featured it in their advertising. Requests for permission to use the message continue to come to the offices of the RCA Radiotron Company. For those who may wish to use the pledge in their advertising, it is given in full below:

### IN OUR SERVICE WORK WE PLEDGE—

1. To Use the Highest Quality Materials.
2. To Be Thorough in Our Work.
3. To Handle Your Property With Care.
4. To Keep Our Promises.
5. To Charge a Fair Price for Our Services.
6. To Use the Standard Radio Tube—RCA-Cunningham.



Audio transformers used at Station WLW. Compare these 20-ton giants with the ordinary radio set transformer held in the man's hand.

## Many Important Advances in Tube Design Recently

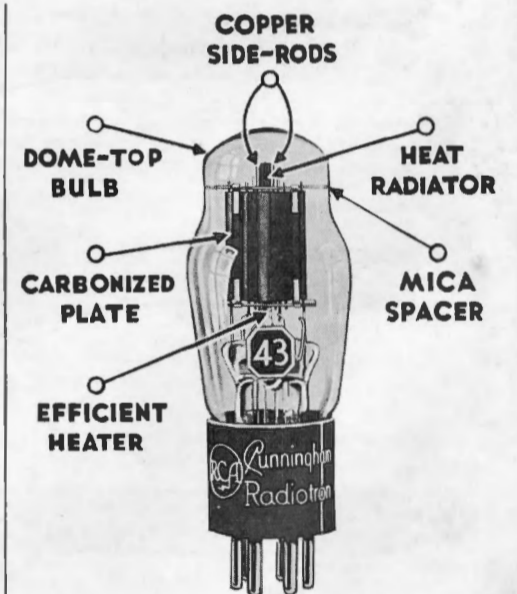
Improvements in radio-tube design and construction are not necessarily limited to the forward steps represented by the introduction of new tube types. Existing radio-tube types are constantly being made better by careful study of their inherent weaknesses and the adoption of new manufacturing technique designed to overcome these faults.

The RCA Radiotron Company is constantly experimenting to determine how the quality and uniformity of their product can be improved. The past year has marked the introduction of many improvements in the design and construction of Cunningham Radio Tubes and RCA Radiotrons. Some of these improvements are readily apparent, while others of equal importance are not so obvious.

### Dome-Bulb Construction

The introduction of the dome-bulb type of construction has made possible the greater uniformity of RCA Radiotrons and Cunningham Radio Tubes. This dome-bulb construction has been incorporated in most of the newer types. Older types are being adapted to this form of construction as rapidly as development and manufacturing activities permit.

A mica support at the top of the electrode assembly fits into the dome of the bulb, bracing the tube's structure against mechanical displacement. Furthermore, the greater strength of the electrode assembly secured by the dome support, has made it possible to simplify the construction of the tube, thus eliminating many welds and parts, and reducing the chances of error during assembly. The resulting increase in uniformity of tube characteristics is of particular interest to the set



builder, since it permits him to design receivers with closer tolerances and consequently better performance. The greater strength and rigidity of the dome bulb prevent mechanical injury to the electrodes during shipment and use.

### Reduced Size of Bulbs

Many new RCA Radiotrons and Cunningham Radio Tubes are considerably smaller than preceding types. In some cases this reduction in size has been made possible by the use of better glass and by structural improvements in the tubes themselves. Since more efficient dissipation of heat reduces the limiting effects of grid emission and stem electrolysis, higher outputs are obtainable with these small-sized tubes. The smaller size bulbs permit a saving in chassis space, a reduction in shipping weight, and the use of less packing material.

## Twenty 100-KW RCA Tubes in This Job



When Station WLW goes on the air, twenty 100-KW RCA Tubes supply the 500,000 watts that make WLW "the nation's station." Whether for giant broadcasting stations or home receivers, RCA Radio Tubes are standard.

# RCA Replacement Parts Distributors Listed

RCA factory-tested replacement parts are designed for their job. Their performance is assured by the same rigid tests and inspections which apply to all RCA products. You will find the distributors below to be among the best distributors in the key-markets of the country.

**ALBANY, N. Y.**  
Capital City Dist. Corporation,  
1039 Broadway

**ALLENTOWN, PA.**  
Bee, Incorporated,  
622 Linden Street

**AMARILLO, TEXAS**  
Amarillo Hardware Company,  
506 Tyler Street

**ATLANTA, GA.**  
Dixie Radio Dist., Incorporated  
144 Walton Street, N.W.  
Polk Musical Supply Company,  
29 Pryor Street, N.E.

**BALTIMORE, MD.**  
Southern Wholesalers, Incorporated,  
1511 Guilford Street

**BIRMINGHAM, ALA.**  
Moore-Handley Hardware Company,

**BOSTON, MASS.**  
Eastern Radio Company,  
88 Pearl Street  
H. Jappe Company,  
46 Cornhill Street

**BUFFALO, N. Y.**  
New York Talking Machine Company,  
327 Washington Street

**CHARLESTON, W. VA.**  
Charleston Electric Supply Company,  
914 Kanawha Street

**CHARLOTTE, N. C.**  
Southern Radio Corporation,  
208 South Tryon Street

**CHICAGO, ILL.**  
Allied Radio Corporation,  
823 West Jackson Boulevard  
Chicago Talking Machine Company,  
111 North Canal Street  
Newark Electric Company,  
226 West Madison Street

**CINCINNATI, OHIO**  
Harten-Knodel Dist. Company,  
801 Sycamore Street

**CLEVELAND, OHIO**  
Midland Radio Company,  
725 St. Clair Avenue, N.W.  
Cleveland Ignition Company,  
1301 Superior Avenue, N.E.

**COLUMBUS, OHIO**  
Pixley Electric Supply Company,  
129 East Chestnut Street

**DALLAS, TEXAS**  
Southwestern Music Corporation,  
517-A South Ervay Street  
Texas Radio Sales Company,  
2105 Commerce Street

**DAYTON, OHIO**  
Copp Radio Laboratories,  
Stratford at Monument Avenue

**DENVER, COLO.**  
Hendrie Bolthoff Mfg. and Supply Co.,  
1635 Seventeenth Street  
Interstate Radio & Supply  
1639 Tremont Street

**DES MOINES, IOWA**  
Iowa Auto Market, Incorporated,  
1309 West Locust Street

**DETROIT, MICH.**  
Auto Electric & Service Corporation,  
90 Selden Avenue  
Griener Brothers,  
1447 First Street  
Radio Specialties Company,  
171 East Jefferson Avenue  
Radio Distributing Company,  
129 Selden Avenue

**ELMIRA, N. Y.**  
Barker, Rose & Kimball, Incorporated,  
511 Baldwin Street

**EL PASO, TEXAS**  
W. G. Walz Company,  
500 San Francisco Street

**EVANSVILLE, IND.**  
Smith Distributing Company,  
15 North Main Street

**FORT WAYNE, IND.**  
The Gibson Company

**GRAND RAPIDS, MICH.**  
Radio Distributing Company,  
235 Market Street

**HARTFORD, CONN.**  
Harty & Young,  
203 Ann Street  
Post & Lester Co. of Hartford, Inc.,  
10 Chestnut Street

**HOUSTON, TEXAS**  
Automatic Sales Corporation,  
952 M. and M. Building

**INDIANAPOLIS, IND.**  
The Gibson Company,  
433 North Capitol Avenue

**JACKSONVILLE, FLA.**  
Glover Weiss Company,  
4 East Bay Street

**KANSAS CITY, MO.**  
Bunting Applebee Company,  
1012 McGee Street  
Moser & Suor, Incorporated,  
2222 McGee Trafficway

**LINCOLN, NEBR.**  
R. S. Proudft Company,  
720 "O" Street

**LITTLE ROCK, ARK.**  
Gunn Distributing Company,  
417 Capitol Avenue

**LOS ANGELES, CALIF.**  
Leo J. Meyberg Company,  
335 West Washington Boulevard

**LONG ISLAND, N. Y.**  
Air Associates, Incorporated,  
Roosevelt Field, Garden City

**LOUISVILLE, KY.**  
Smith Distributing Company,  
817 West Market Street

**MADISON, WIS.**  
Taylor Electric Company,  
201 East Washington Avenue

**MEMPHIS, TENN.**  
Riechman-Crosby Company,  
223 South Front Street

**MIAMI, FLA.**  
Pan-American Radio, Incorporated,  
1809 N.E. Second Avenue

**MILWAUKEE, WIS.**  
Taylor Electric Company,  
730 North Jackson Street

**MINNEAPOLIS, MINN.**  
Lucker Sales Company,  
608 First Avenue, North

**MONTREAL, CANADA**  
Victor Talking Machine Company,  
of Canada, Ltd.,  
St. Antoine and Lenox Streets

**NEWARK, N. J.**  
Radio Distributing Corporation,  
588 Broad Street  
Wholesale Radio Service Co., Inc.  
219 Central Avenue (at Lock Street)

**NEW ORLEANS, LA.**  
Phillip Werlein, Ltd.,  
605 Canal Street

**NEW YORK, N. Y.**  
Bruno-New York, Incorporated,  
460 West 34th Street  
Wholesale Radio Service,  
100 Sixth Avenue

**OKLAHOMA CITY, OKLA.**  
Hughes-Bozarth-Anderson Company,  
15 East Grand Avenue  
Miller Jackson Company,  
111 East California Street

**OMAHA, NEBR.**  
R. S. Proudft Company,  
715 South 9th Street

**PEORIA, ILL.**  
Klaus Radio & Electric Company,  
707 Main Street

**PHILADELPHIA, PA.**  
Raymond Rosen & Company,  
117 North Seventh Street  
Weymann Company,  
13th and Arch Streets

**PITTSBURGH, PA.**  
Ludwig Hommel & Company,  
600 Second Avenue

**PLATTSBURGH, N. Y.**  
A. H. Marshall Company, Inc.

**PORTLAND, MAINE**  
The James Bailey Company,  
264 Middle Street

**PROVIDENCE, R. I.**  
Ballou, Johnson & Nichols Company,  
128 Dorrance Street

**RICHMOND, VA.**  
Benjamin T. Crump Company,  
1310 East Franklin Street  
Johnson Gasser,  
1402 East Main Street

**ROCHESTER, N. Y.**  
Chapin Owen Company, Inc.,  
205 St. Paul Street

**ST. LOUIS, MO.**  
Aeolian Company of Missouri,  
1004 Olive Street

**SALT LAKE CITY, UTAH**  
Zions Cooperative Mercantile  
Institution

**SAN ANTONIO, TEXAS**  
Southern Equipment Company,  
Merchant Building,  
Navarro and Villita Streets

**SAN FRANCISCO, CALIF.**  
Leo J. Meyberg Company,  
70 Tenth Street

**SEATTLE, WASH.**  
Harper-Meggee, Incorporated,  
Republican and Terry Streets

**SPRINGFIELD, MASS.**  
Capital City Distributing Corporation,  
364 Worthington Street

**SPRINGFIELD, MO.**  
Ozark Motor & Supply Company,  
308 South Jefferson Street

**SYRACUSE, N. Y.**  
Onondaga Auto Supply Company,  
351 East Onondaga Street

**TAMPA, FLA.**  
Electric Supply Company, Inc.,  
121 South Franklin Street  
Thurrow Radio Distributors,  
108 East Case Street

**TOLEDO, OHIO**  
Aitken Radio Company,  
1014 Madison Avenue  
Baumgardner Distributing Company,  
1013 Jefferson Avenue

**TRENTON, N. J.**  
J. Harry Hearn  
Front and South Warren Streets

**WASHINGTON, D. C.**  
Southern Wholesalers, Incorporated,  
1519 "L" Street, N.W.

**WATERTOWN, N. Y.**  
Onondaga Auto Supply Company,  
249 State Street

**WICHITA, KANSAS**  
Moser & Suor, Incorporated,  
138 North Market Street

**WILMINGTON, DEL.**  
F. R. Gooding Company,  
5th and French Streets

**WORCESTER, MASS.**  
H. Jappe Company,  
37 Mechanic Street

## RUBINOFF gives a Tip— that brings new joy to radio listeners



### NEW RADIO TUBES Improved 5 ways by



### GET THIS NEW RADIO THRILL

Have your dealer test your tubes today. Insist on the only tubes guaranteed by RCA Radiotron Co., Inc., to have these 5 vital improvements:

- 1 Quicker start
- 2 Quieter operation
- 3 Uniform volume
- 4 Uniform performance
- 5 Every tube is matched



## RCA TUBE ADVERTISING SELLS SERVICE IDEA

The radio service sales engineer gets a "break" in the popular strip-style advertising that RCA Radiotron Company is running in outstanding magazines—Saturday Evening Post, Collier's, Liberty, Literary Digest and several radio fan magazines.

Emphasizing Micro-Sensitive quality, the ads featuring famous radio stars in conversation about radio reception, suggest definitely that, if the set is not performing as it should, a radio service man be called to install Micro-Sensitive RCA Tubes.

These ads have been called "the best tube advertising RCA ever did." They are primarily designed to sell tubes, but the idea that a service man should install those tubes, and make any other necessary repairs, has been carefully incorporated in several of the series.

## RCA Tube Agency Designed to Protect Profits, says Cunningham

### MORE THAN CONSIGNMENT

Many Features Make the RCA Radio Tube Agency Plan a Valuable Franchise

When the manufacturer of the fastest-selling brand of any type of merchandise—the product which already occupies first place in dealer and consumer acceptance—adopts an agency plan of distribution, that plan has a value greatly in excess of the consignment feature alone. It must be valued first of all for the merchandising advantages already associated with the leading product.

To use an illustration from another field, suppose you were to choose between an agency for Eastman Kodak Film and a consignment proposition on XYZ Film. Undoubtedly you or any other dealer would choose Kodak—the product that already enjoys a quality reputation and public demand.

Similarly, the agency for RCA Radio Tubes should not be confused with “just another consignment proposition.” In contrast with other consigned radio tubes, RCA Radio Tubes—Radiotron and Cunningham—have long been established as the leaders in quality and in sales. These incalculable advantages continue under the Agency Plan. Thus, consignment is not the feature, but rather one attractive addition to a long list of attractive features.

In adopting the Agency Plan the Cunningham-Radiotron organization places itself in a position to establish sound business-building policies and can therefore protect good dealers from the few who, through price cutting, would destroy market stability and consumer confidence.

In the operation of this new plan of selling, I personally pledge that it will be administered fairly in the interests of the public, the dealer and the distributor. I earnestly solicit your support for our common good.

E. T. Cunningham,  
President, RCA Radiotron Co., Inc.

## RCA Develops World-Wide Antenna System

(Continued from page 1)

The RCA World-Wide Antenna System has been developed after considerable research. It provides, primarily, an efficient means of collecting the shorter-wave signals on a special “double doublet” or Duo Dipole Antenna. It then transfers the signal energy with negligible loss over a special, balanced transmission line to a newly developed matching transformer for the short-wave or all-wave radio-receiving set. The transmission line has been carefully designed to match the double doublet antenna to the special receiver matching transformer.

Due to the design of the transmission line and the matching transformer little or no extraneous noise interference is picked up on the transmission line lead-in. This feature has obvious advantages, as it is a well-known fact that noise interference is more serious on the short-wave frequencies than on the standard broadcast frequencies.

### Increases Signal-to-Noise Ratio

Due to a most efficient match of the double doublet to the receiver for the shorter waves (3.5 [3500 K.C.] to 20 megacycles), there would be an unavoidable loss introduced for the frequencies assigned to broadcasting, police calls, etc., namely, 550 to 3500 K.C. A Standard Broadcast (STD) Short Wave (SW) switch is therefore provided on the receiver transformer for improving the reception of the stations operating on the frequencies between 550 and 3500 K.C. Strong local stations can, of course, in most cases, still be received with the switch in the short-wave receiving position.

The RCA Radiotron Company has recently adopted the Agency Plan of distribution. The primary object of the RCA Radio Tube Agency Plan is to assure the orderly distribution of our product in the interest of the public, the dealer-service man and the distributor.

More retailers handle the RCA Cunningham-Radiotron brand than any other make. With such widespread distribution and outstanding consumer demand, some dealers have used the brand as a “Price Loss Leader.” This demoralizing practice has caused loss of profit to RCA Radio Tube accounts.

Under the Agency Plan, no longer will it be possible for merchants to use the famous Cunningham-Radiotron brand as a “Price Loss Leader.” The Agency Plan gives us control over our product. The list price becomes the sale price. This means protected profits for you.

### Better—Not More Distribution

The RCA Radio Tube Agency Plan has been developed, not as a means of getting additional outlets, but of obtaining orderly distribution in your interest and that of our mutual customers. All RCA Radio Tube Agents will be carefully selected. *Better distribution—not more distribution*—is the keynote of this Agency Program. With fewer dealers handling our product, there will be a larger volume of business for those who remain. You can build your tube business on a quality and service basis with the knowledge that the retail prices on RCA Radio Tubes will not be cut by your competitors.

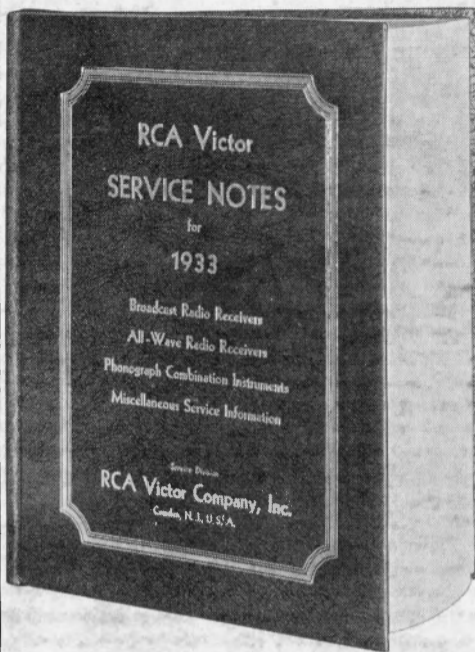
As an RCA Radio Tube Agent you will be able to carry an adequate stock without investment. You pay for the merchandise as you sell it—not before.

### Complete Price Protection

You will have a tube stock adequate to take care of the needs of your customers, and yet the fear of over-buying is removed. No slow moving or dead stock can cut your profit margins. You will have complete inventory protection against price declines. And you will have no insurance and no transportation (except for local cartage) to pay.

As an agent for RCA Radio Tubes you are a “participant” in the business of the leading tube manufacturer—the leader in research, engineering and manufacturing,

## Service Division Issues New 300-Page Book of Service Notes



Under the direction of E. M. Hartley, Manager, the Installation and Service Division of RCA Victor has just published a new book of particular interest to all RCA Victor Distributors and Dealers and also to independent servicemen.

This new bound volume contains complete service notes for 1933, including considerable additional information of constant interest, such as impedance, inductance and capacity charts, antenna length charts for short-wave receivers, reception charts for time and season of short-wave bands, and complete data sheets on all types of Radiotrons.

The book contains over 300 pages, is bound with a durable and stiff fabric cover lettered in gold, and is designed so that it will lie flat on the work bench when open. This is one of the most complete works on the subject and covers the latest revision of service notes on all the models listed.

This book may be ordered through any of the local RCA Victor instrument or replacement parts distributors. The net price is \$1.00.

the leader in advertising, the leader in consumer demand, the leader in developing workable sales aids and plans.

### Attractive Compensation Schedules

Attractive compensation schedules are provided. Because you will be able to get the full list price for our product, your total profit will be increased.

## Small-Size, Full-Range Feature RCA Oscillator

Not so long ago, when receivers were of the “tuned radio frequency” type, a home-made oscillator built in a cigar box might suffice, but today a full-range oscillator of precision construction is absolutely necessary. In fact, all-wave receiver servicing is practically impossible without an oscillator.

Radio service sales engineers have enthusiastically placed the stamp of approval on the oscillator recently developed by RCA Victor engineers. Its compactness and light weight make a big hit with any engineer who has ever “toted” the ordinary heavy oscillator in a case resembling a small trunk. Including the raised handle, the RCA Victor Test Oscillator Type TMV-97-A stands only 8½ inches high by 10 inches long and 4½ inches wide. It weighs only 3½ pounds including batteries.

The performance of the instrument is as attractive as the appearance. Its frequency range is continuously variable from 150 K. C. down to 25,000 K. C. by means of a seven-tap range switch. A generous overlap is provided between bands so that no gaps occur.

A separate oscillator and modulator with 30 per cent modulation at 400 cycles afford an accuracy and constancy of calibration usually approached only by crystal control. Since this oscillator operates on the fundamental rather than from a



Small and light—but what an oscillator!  
RCA Victor Type TMV-97-A

harmonic, there is never any doubt as to the frequency being emitted. In the instruction book, calibration curves are given for each band, which are accurate to within 3 per cent, a far closer tolerance than will be required in ordinary service work.

The net price of Test Oscillator Type TMV-97-A is only \$33.50. Ask your RCA parts jobber.

## Eleven Questions on the RCA Antenna System

Q. 1. How high should the horizontal portion (29-foot sections) of the double doublet be installed above ground?

A. Good results are obtained when the horizontal portion is 30 feet above ground. On top of steel-frame buildings ground is usually considered as being the roof.

Q. 2. How does signal strength vary with height of the doublet (29-foot sections) for the short-wave bands?

A. The signal strength received increases with the height above ground.

Q. 3. Is the doublet antenna directional?

A. Yes, theoretically it receives best from stations located along the perpendicular and in the same plane to the horizontal span (29-foot sections) of the doublet. See Figure 2.

Q. 4. Is a vertical doublet better in performance than a horizontal doublet?

A. Yes and no. There is no directional effect with the vertical doublet, but, on the other hand, the horizontal doublet usually has a better signal to noise ratio. An advantage perhaps is that in some locations a vertical doublet of the type shown in Figure 5 may be easier to install.

Q. 5. How does the special short-wave, all-weather cable compare with lead-in systems using transposition blocks?

A. (a) The losses over the normal lengths of lead-in of the special cable are negligible compared to the type using transposition blocks.

(b) Due to the construction of the special cable, installation of the lead-in is extremely simplified, less objectionable in appearance and less costly.

Q. 6. If the special cable lead-in length must be increased over 110 feet, how should it be done?

A. The lead-in length should only be increased by multiples up to two times 110 feet. In other words, the next best match would be 220 feet. After 220 feet, the length of line is not critical.

Q. 7. Should the alignment of the RCA Victor Model 140 be checked after connecting the All-Wave Kit?

A. Yes. It will usually be found that “A,” “B” and “C” Band antenna adjustments are O. K. However, usually “D” Band antenna (transformer on top of chassis) will need re-trimming.

Q. 8. When installing special receiver transformer at set, what must always be kept in mind?

A. The important thing is to have the ground lead from the transformer to the receiver absolutely as short as possible.

Q. 9. What improvement is noticed when the Kit is used on receivers using converters for short-wave reception?

A. Due to now having a tuned circuit (receiver transformer) ahead of the converter, it is found to be helpful in reducing the effect of troublesome cross-modulation from interfering code, local airport or amateur stations. The additional tuned circuit also tends to improve strength of signals received.

Q. 10. How can the total length of the doublet; namely, approximately 58 feet (two 29-foot sections), be decreased?

A. By installing loading coils—an accessory to the Kit (RCA Stock No. 6958)—as shown in Figure 4. These permit a shortening of the over-all length to approximately 33 feet (two 16½-foot sections).

Q. 11. Is the doublet efficient when the horizontal angle between both sides (29-foot sections, or 16½-foot sections) is decreased from 180 degrees?

A. The efficiency of the doublet is decreased as the angle is decreased, due to less r-f voltage being generated in sections of doublet as angle is decreased from 180 degrees. For 90 degrees this may cause as much as 30 per cent decrease in signal strength. See Figure 3.