



RADIO SERVICE NEWS

PUBLISHED IN THE INTEREST OF RADIO SERVICE SALES ENGINEERS

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CAMDEN, NEW JERSEY

Vol. I, No. 5

Phonograph Modernization Offers Big Profits

Remarkable Pencil Given Free For Labels From Ten RCA Antenna Kits

RCA Service Engineers' Pencil Translates Color Code of Resistors Into Plain Figures

EASY TO WIN

All the bewildering calculations usually involved in interpreting the standard R. M. A. Color Code for resistor values are over for service engineers who sell as few as ten RCA World-Wide Antenna Systems during the next three months.

Under the terms of an offer just announced by the RCA Parts Division, a remarkable new automatic pencil, which incorporates a special device that tells at a glance the number of ohms indicated by any resistor marking, is given free to any dealer or service man who sells ten RCA World-Wide Antenna Systems before February 1, 1935. All that is required is that the service engineer or dealer send to RCA Parts Division, Camden, New Jersey, 20 labels from RCA World-Wide Antenna Cartons. Labels from RCA Dealer Demonstration Antenna Kits (the special antenna for stores) are counted as equal to four labels from the regular RCA World-Wide Antenna for home use.

Antenna Sales Up

Present indications are that the majority of all radio dealers and service engineers will soon be sporting the RCA Service Engineer's Pencil, since the RCA World-Wide Antenna is selling like hot cakes these days. Advertising support given dealers who handle the Antenna has been a factor contributing to the popularity of RCA Antenna System, but the intrinsic merits of the product itself have been the chief cause of the sales records established by this aid to better radio reception.

Is High Grade Pencil

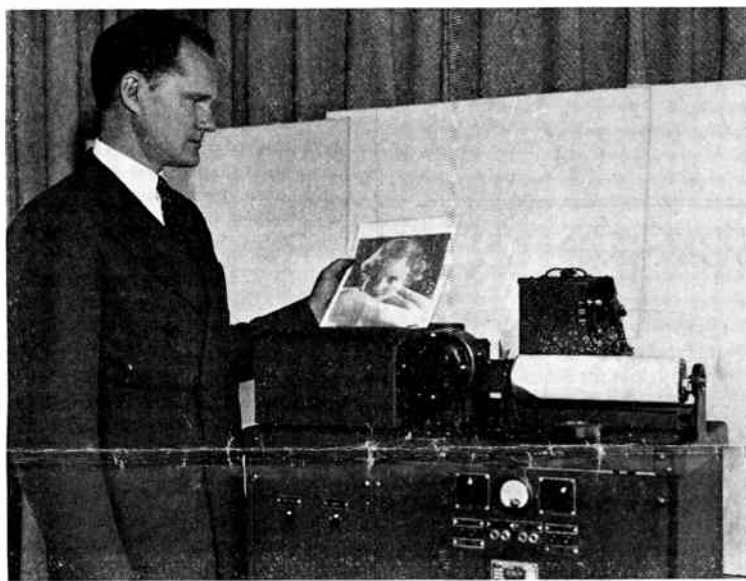
Even without the resistor color code feature, the RCA Service Engineer's pencil would be well worth striving for. It is the finest product of one of the largest automatic pencil manufacturers. The barrel is of black composition material, richly polished. The tip, clip and the bands are gold-plated. Turning the knob propels or repels the lead. Removing the knob discloses an eraser and a magazine of leads.

But the outstanding feature of the pencil, from the service engineer's standpoint, is the resistor color code bands. Never before has the service engineer been able so quickly and con-

(Continued on page 8, col. 2)

SAVE THE LABELS FROM RCA WORLD-WIDE ANTENNA KITS

SENDS FACSIMILE MESSAGES



Charles J. Young, RCA Victor engineer, inspects the product of his facsimile communication system

PHILADELPHIA, PA.—A new radio facsimile system which reproduces entire messages, maps and pictures directly on ordinary paper at the rate of a full letter-sized sheet every eight minutes, was described by Charles J. Young, research engineer of the RCA Victor Company, to members of the Institute of Radio Engineers, who met recently in Houston Hall of the Moore School of Electrical Engineering.

While Mr. Young emphasized that it is premature to attempt to evaluate all of the practical uses to which the new development might be put, he suggested that such a simplified system could be

(Continued on page 3, col. 4)

NOTED NAMES ON PROGRAM OF I. R. S. M. MEET

Famous Speakers Make October 19th "Big Night" of Convention

Friday, October 19th, is hailed as "The Big Night" of the Regional Convention of the Institute of Radio Service Men, to be held at the Pennsylvania Hotel, New York City, on October 19th, 20th and 21st, according to publicity sent out on the meeting.

"The Big Night" takes its name from the prominence of the speakers scheduled for this first night of the meeting and from the widespread interest in the subjects of their talks. The headliners for the evening include E. T. Cunningham, President, T. F. Joyce, Advertising Manager, and W. F. Diel, Test Instrument Engineer, all of RCA Victor

(Continued on page 6, col. 1)

SPECIAL RCA KITS USED TO PLAY OLD PHONOGRAPHS THRU RADIOS

SERVICE ENGINEERS DISCOVER NEW SOURCE OF REVENUE

Without benefit of ballyhoo, radio service engineers have discovered a new source of revenue and developed it until it has grown to be an important business even before the general radio trade knew anything about it. It is called "phonograph modernization."

The radio service profession is taking it up in a big way because the profits are large and by the very nature of the work there is not likely to be any destructive competition. Radio service engineers are the only branch of the industry in a good position to sell "phonograph modernization" and, likewise, are the only ones who can do the work. Every job is more or less a "custom job," but on the other hand any good service engineer can easily handle the work.

Kits Simplify Jobs

The demand for the various phonograph parts needed to bring the old talking machines up to date has grown to such proportions that the RCA Parts Division has recognized it and created Phonograph Modernization Kits that eliminate any uncertainty as to matching of parts.

A radio service engineer can now select the Kit that has a pickup of the proper impedance, etc., and be sure that all the parts are properly matched and that the price he quotes is correct.

Free Booklet Explains Work

As a further help to servicemen who are keeping their shops humming by this new activity, the RCA Parts Division has published a booklet, *Modernizing Phonographs—the 1935 Opportunity for Service Engineers*. This booklet explains away all technical problems of phonograph modernization and catalogs the Kits and individual parts available for this work. It is sent free on request to the RCA Parts Division, Camden, New Jersey, and all service engineers are urged to write for it at once.

Parts included in RCA Phonograph (Continued on page 4, col. 3)

Third Series of RCA Service Meetings Starts October 25th

A third series of meetings for service engineers will be conducted by the RCA Service Division, beginning about October 25th. These meetings will be held in all sections of the United States, groups of factory engineers leaving Radio Headquarters on or about the above date to conduct meetings simultaneously in the larger centers of population.

All Service Men Invited

Dates have not yet been definitely determined for the third series of meetings. All service engineers and dealers are invited to attend and are urged to consult the nearest RCA Victor distributor for information as to date and place of meeting.

Each group will be manned by spe- (Continued on page 5, col. 3)

OUR STOCK IN TRADE—WHAT IS IT?

An Editorial by E. M. Hartley, Manager, RCA Parts Division

Our stock in trade—what is it? What have we to sell the public? Is it tubes? Is it antenna systems? Is it transformers? Resistors? Overhaul jobs?

No! Emphatically no! Few of us run parts stores.

We are not selling tubes or transformers or resistors any more than the physician is selling the packet of pills he leaves on the bedside table.

That physician was called because the family had confidence in him, not because they wanted to buy his pills. That physician had "sold" himself. And he did not do so by offering cut rates or "free" treatments or cheap medicines.

So, too, the radio service profession must sell itself. It must create confidence in itself. And it cannot do so by attempting to make exorbitant profits on tubes and parts, and offering its main stock in trade, professional ability and integrity, at cut prices.

Tubes, parts, and accessories are side lines of radio service. The best policy is to sell the very best merchandise at honest prices, and to sell service, too, at honest prices. In many cases today service is being sold at dishonest prices, prices that cheat the radio service engineer of his just compensation.

Note how in their booth, see page 2, the Philadelphia Radio Service Men's Association sold themselves, not the merchandise they handle. By assuring the public that they handled only the finest in parts and tubes (parts and tubes are a small part of the proper cost of radio service, anyway) they sold their chief stock in trade, THEIR PROFESSIONAL ABILITY AND INTEGRITY.



E. M. Hartley

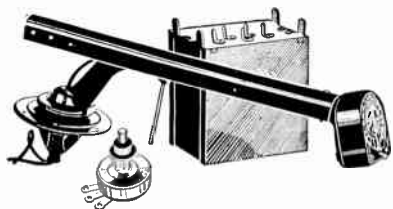
YOUR 1935 OPPORTUNITY

Phonograph modernization is the 1935 Opportunity for Radio Service Engineers. Countless old-style phonographs and countless families who long to hear the recordings of their old and new favorites, present a tremendous field for "plus" sales to every radio service engineer who has some sales ability also.

Now, with RCA Phonograph Modernization Kits, you can cash in on this new, growing market by offering your customers modernization jobs using parts that are scientifically matched at the factory, the same parts that are used in RCA Victor instruments, the same quality that has made RCA Victor the leader in music reproduction throughout the world.

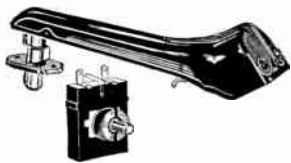
Use the postcards shown on page 3 to bring in the customers. Then choose the proper kit from the assortment below. An electric motor with mounting bolts, two-speed turntable with shift lever, and automatic cut-off switch, may also be required, and you can order them all from your RCA Parts Distributor from the listing below.

RCA PHONOGRAPH MODERNIZATION KITS



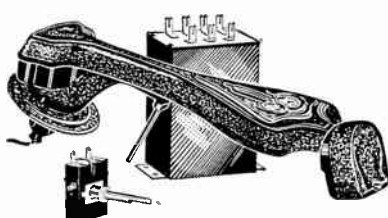
RCA
Phonograph Modernization Kit
Stock No. 11099

Contents: 200-ohm Pickup, Straight Type Pickup Arm, 500-ohm Volume Control, and Input Transformer. List price, \$12.10.



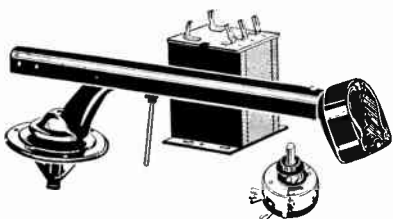
RCA
Phonograph Modernization Kit
Stock No. 11100

Contents: A 2450-ohm Midget Pickup and 5000-ohm Volume Control. For inexpensive installations where space is limited. Usually used with Stock No. 9038 Motor, shown directly below at right. List price, \$5.85.



RCA
Phonograph Modernization Kit
Stock No. 11080

Contents: 7-ohm Pickup, Inertia Type Pickup Arm, 20,000-ohm Volume Control, and Input Transformer. List price, \$13.10.



RCA Phonograph Modernization Kit
Stock No. 11075

Contents: 20-ohm Pickup, Straight Type Pickup Arm, 60-ohm Volume Control, and Input Transformer. List price, \$10.80.

RCA Phonograph Modernization Kit
Stock No. 11076

Contents: 700-ohm Pickup, Inertia Type Pickup Arm, 5000-ohm Volume Control. Due to high impedance of pickup, no input transformer is included. List price, \$10.50.

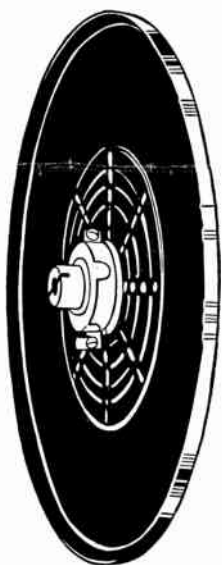


MOTORS, TURNTABLES, ACCESSORIES



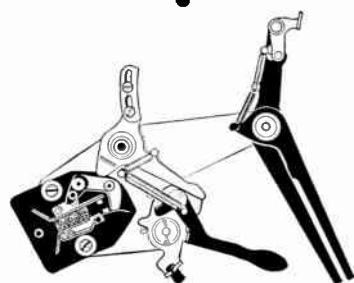
Stock No. 8989

MOTOR complete, for 60 cycles, 115 volts. This is the same sturdy motor used in the highest quality of phonographs and combinations made by the RCA Victor Company. List price, \$18.52.



Stock No. 8948

TWO SPEED TURNTABLE. Fits shaft of Stock No. 8989 Motor (shown above). This turntable adds distinction to your work and gives it the stamp of modern workmanship. It is the same turntable used in RCA Victor Combinations to play both standard (78 R.P.M.) and long-playing (33½ R.P.M.) recordings. List price, \$5.50.



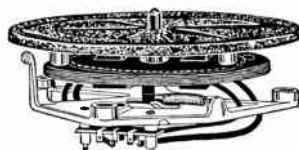
Stock No. 3391

MOTOR BOARD SUSPENSION SPRING ASSEMBLY (not illustrated), comprising 1 bolt, 1 top spring, 1 bottom spring, 2 cap washers, 1 C washer and 1 nut. Recommended for mounting a motor board for Stock No. 8989 in a cabinet. Specially tuned springs prevent vibration being transmitted mechanically to the pickup and spoiling reproduction. Four sets required. List price, 4 sets, \$2.00.



Stock No. 11106

The **SHIFT LEVER** used to change the speed of the turntable (8948) from standard to long playing. Not included with 8948. List price, \$98.



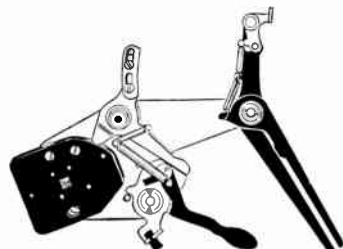
Stock No. 9038

SYNCHRONOUS TYPE MOTOR WITH TURNTABLE—115 volts, 60 cycles. Although this motor is not self-starting, it serves the purpose admirably where cost is a factor. Where space is limited this unit fits in easily. Plays either 10 or 12-inch records at standard speed. List price, \$8.00.

This is the sturdy motor and turntable used in the RCA Victor Record Player. Its small size, light weight and low price make it ideal for portable equipment or for permanent installations in which either cost or space is the main consideration.

Stock No. 3813

MOTOR MOUNTING ASSEMBLY (not illustrated), comprising one metal bushing, two rubber bushings, one flat washer, one lock washer and one nut. Three sets required to mount Stock No. 9038 Motor (above). List price, 3 sets, \$1.68.



Stock No. 6896

AUTOMATIC ECCENTRIC BRAKE to stop turntable at end of record having an eccentric groove. To be used with Kits Nos. 11075 and 11099 (Pickup arms of the inertia type). List price, \$2.50.

**AT YOUR RCA PARTS DISTRIBUTOR OR
WRITE FOR BOOKLET**

"PHONOGRAPH MODERNIZATION"

"the 1935 Opportunity for Service Engineers"

RCA PARTS



DIVISION

RCA VICTOR COMPANY, INC.

CAMDEN, NEW JERSEY

Radio Racketeer Exposed in Verse

The editor of *High-Mu*, service department house organ of Harper McGee, Inc., RCA Parts distributor of Seattle, broke into verse anent the radio service racketeer. Here is the result of his poetic outburst:

MOTHER GOOSE TO DATE

Mistress Mary, quite contrary,
How is your radio?
It squeals and yells, has fainting spells
And simply will not go.

Mistress Mary, quite contrary,
Who fixed your radio?
The Butcher, the Baker, the Free
Inspection faker,
Because their prices were low.

Mistress Mary, quite contrary,
Your troubles are all your own.
Your set's repaired with off brand parts,
The tubes are brands unknown.

Mistress Mary, quite contrary,
Here is some good advice—
Give your rejection to free service
inspection—
Good labor is worth its price

ANTENNA SOLD WITH ALL SETS SOLD ON TIME

Philadelphia Dealer Refuses to Sell Sets on Time Payment Without Antenna Also

"Will the RCA World-Wide Antenna System do all that's claimed for it?" That's a question radio owners, dealers and service engineers are asking distributors day after day.

Most emphatically it will, according to all reports from those who have tried this famous antenna system. It does all that the maker claims for it and more.

Dealer Praises Results

L. W. Ettelson, proprietor of the Ridge Radio Electric Shop, 6155 Ridge Avenue, Philadelphia, was so handicapped by man-made interference in the neighborhood of his store that he concluded to make no further attempt to sell all-wave receiving sets.



L. W. Ettelson

Mr. Ettelson says: "What a relief it was to install the all-wave antenna (RCA) and

watch the neon signs across the street, the barber's clippers, the shoemaker's machines and the beauty parlor hair dryers stop interfering with our radio reception."

No Credit Sales Without Antenna

So importantly does Mr. Ettelson regard the RCA World-Wide Antenna System in connection with the sale of all-wave sets, that he refuses to sell a receiver on time payments unless the RCA Antenna is installed. "All all-wave sets sold on time are quoted with the all-wave aerial and sold this way, or there is no sale," writes Mr. Ettelson.

This well-known Philadelphia dealer is not alone in the position he has taken in regard to the sale of all-wave sets. All over the country dealers have discovered that the RCA World-Wide Antenna System sells all-wave sets and keeps them sold. They insist on its installation on all deferred payment sales and, for their own protection, mark on the invoices of all cash sales "RCA World-Wide Antenna System recommended for most efficient operation of this radio."

Dealer Antenna Boosts Sales

Many dealers have found that the problem of convincing customers that short-wave reception requires a special antenna is solved by using the RCA Dealer Demonstration Antenna System. This system serves four receivers, thus making it easier to "sell up" from low-price models.

DEALER REPORTS GOOD RECEPTION IN TOUGH SPOT

Interference From Broadcast Stations Nearby Eliminated by Good Antenna

An RCA World-Wide Antenna System was installed for Gimbel Brothers, Philadelphia, Pa. Just what Gimbel Brothers think of this modern, scientific all-wave antenna is summarized in a letter to Raymond Rosen Company, RCA Victor distributors, of Philadelphia:

Dear Mr. Zeisner:

We heartily appreciate your assistance in connection with the installation of our new RCA Victor all-wave antenna system.

We are particularly gratified with the results obtained; we have previously undertaken short-wave reception of European stations in connection with the use of several alternative antenna systems but without any semblance of satisfactory results.

Poor Location

Despite the fact that we are directly under the antennae of two 500-watt broadcasting stations we are able to tune in European stations with surprising good clarity and without any suggestion of broadcast wave-length harmonics.

Again thanking you, I am,
Yours very truly,
W. P. Saunders,
Buyer, Radio Department.

Effective Booth Display



Background of a booth that attracted much attention at the Philadelphia Electric Show

In designing their booth, the Philadelphia Radio Service Men's Association realized that they had to sell an intangible, that they had to create public confidence. The dignity, simplicity, and singleness of purpose of the above exhibit accomplished the desired results.

POSTCARDS AT PENNY EACH ARE BARGAIN

New Postcards Stamped and Imprinted, Sell Antenna and Phonograph Jobs

To make it possible for radio service engineers to use expertly prepared direct mail material at a minimum cost, RCA Parts Division has prepared four postcards that are designed to stimulate the service business. They are offered, government stamped and with the dealer's or service engineer's imprint, for the cost of the postage alone, or \$1 per 100.

Cigar stores seldom use direct mail methods for contacting their customers. They see them in person so frequently that the direct mail contact is not needed.

Service Business Needs Advertising

So too with gasoline filling stations. They see their customers frequently. But when we examine the methods of the busy auto repair shop, we find that in many cases they make effective use of direct mail to maintain contact with old customers during the periods when their cars are running satisfactorily, and to establish contact with potential new customers.

The radio service engineer is in the same position as the auto repair shop. Radio service is needed infrequently. The customer has plenty of time to forget where he got service last time,—or to be attracted to some other shop by its advertising. Therefore the need for

Uses Stickers On All Parts

M. H. Sessions, of Brownwood, Texas, offers the profitable suggestion of putting identification stickers not only on his tubes, but also on all new parts he installs in sets.

Stickers Protect Dealer

Several apparent advantages spring from this practice. The name of his store is brought before the customer's eye as soon as he looks inside his radio. This means that Mr. Sessions will be thought of first when repair work is necessary. Another tangible benefit lies in the service engineer being able to check at once for parts which he knows to be in good order. It also protects the service engineer should other parts of the receiver later become defective.

Stickers of Several Sizes

Accompanying his letter, Mr. Sessions encloses samples of his labels, each carrying the wording, "This part installed by M. H. Sessions." For resistors he advocates a sticker about one inch square; for voltage controls, etc., one about 1 by 1 1/4 inches; and for condensers, etc., one about 1 by 2 inch. The larger labels have the motto printed in small type near the bottom, leaving room at the top for the date of installation and remarks.

advertising and especially for the intimate contact that direct mail gives.

Greatest Advertising Bargain

The government-stamped postcard is without a doubt the great bargain in direct mail advertising. For one cent, including both postage and paper stock, anyone can send a message that is necessarily short enough to encourage the recipient to read it and long enough to tell the story if the message is properly written.

SAYS OUTPUT METER IS BIG AID IN SELLING

Dealer Finds Glow Lamp Type Output Indicator Makes Big Impression on Customers

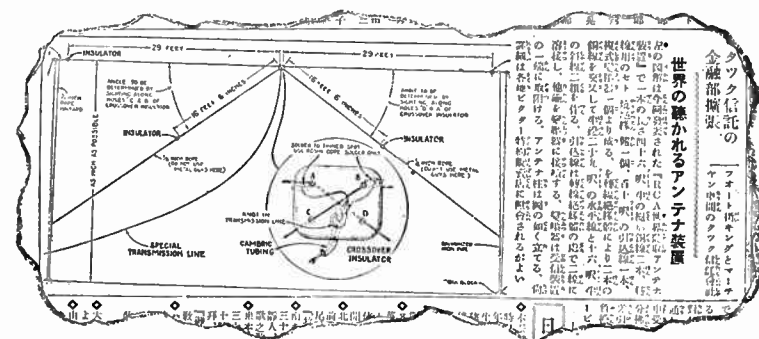
Even if it cost many times \$4.00, the new RCA Output Indicator would be worth the cost for its effect on customers, in the opinion of T. G. Donnelly, radio service engineer of Collingswood, N. J.

The RCA Output Indicator, Type TMV-121-A, uses a neon lamp in place of the usual meter. Thus in aligning a receiver, correct alignment is indicated by the intensity of the glow in the neon lamp rather than by a meter reading. Since even a layman can see the variations in the lamp and quickly understand the meaning of it, customers are impressed far more than by the same operation performed with an old style output indicator.

Ear Alignment Unreliable

"Several times since getting this new output indicator I have had occasion to align receivers in the customers' homes," explained Donnelly. "You should see them perk up and show interest and become duly impressed when I explain this instrument to them. They watch the light and when you finish they know you have done the job right. I wasn't getting half the value out of my oscillator before I got the output indicator. It proves to me that you can't depend on the ear for an accurate job. I think it is one of the best \$4.00 investments I ever made."

Not a Laundry Ticket



It may look like a laundry ticket, but actually it is an advertisement of the RCA World-Wide Antenna, clipped from a Japanese newspaper published in Honolulu, Hawaii. (Editor's Note: If the ad is upside-down, turn the paper around to read the ad, if you think that will help.)

SENDS FACSIMILE MESSAGES

(Continued from page 1, column 2)

used to flash messages in their entirety, from city to city, exactly as written by the sender, to supplant the present method of sending such messages, letter by letter, in the comparatively laborious Morse code.

He pointed out that the new facsimile system should prove useful in police and crime detection work. Fingerprints, identifying photographs and other useful information could be exchanged by police departments to aid in the apprehension of criminals.

Mr. Young also described a series of successful experiments conducted between the shore and ships at sea, in which complete weather maps were prepared by observers and sent to the vessels at frequent intervals to aid navigation.

No Photo-Developing Required

The recorder system developed by Mr. Young in the RCA Victor laboratories dispenses with the cumbersome processing, or photo-developing re-

quired by other facsimile systems, by utilizing ordinary carbon paper to print directly on ordinary white paper. Continuously feeding rolls of both the carbon and the paper are led past a metal cylinder, on which a single spiral of wire projects slightly above the surface.

Complete Letter in Eight Minutes

Fluctuations in intensity of the incoming signals press the paper and carbon together against this spiral to make marks corresponding to the light and shade of the original at the transmitter. Since the receiver and the transmitter are synchronized, an exact reproduction results.

The facsimile recorder described by Mr. Young traverses a standard-width, letter-size page, measuring 8 1/2 by 11 inches, at the rate of 1.2 inches per minute. Thus, a full-sized page filled with single-spaced typing is completed in eight minutes, or at the rate of 100 words per minute.

Government Stamped Postcards, Imprinted, \$1 per 100

The one-cent stamped postcard is probably the world's greatest advertising bargain. Now you can get these business producers printed, stamped, imprinted with your name, and delivered to you—and later to your customer—for the cost of the postage alone. And the jobs they

bring in—antenna installations and phonograph modernization jobs—are real profit-makers.

Order by number. Price \$1 per 100, imprinted. At your RCA Parts Distributor; or direct from RCA Parts Division, Camden, New Jersey, if order is accompanied by remittance.



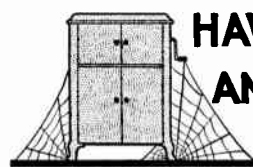
Your Radio Can Take It

It takes all the noise and interference and passes them on to you unless it is equipped with a scientific antenna system. For short-wave reception especially, you must have an efficient antenna. We specialize in antenna installations and recommend the noise-reducing RCA World-Wide Antenna System... a remarkable "double-doublet" system that reduces noise and brings in stations you never got before. Let us make a *Certified Installation*... Phone us today.

YOUR IMPRINT HERE

Street Address Phone Number
City and State or Slogan here

EM7



HAVE YOU OLD RECORDS . . . AN OLD PHONOGRAPH?

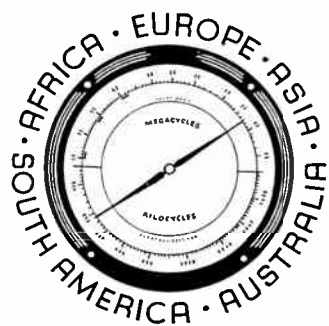
When you can't get what you want on the radio, why not listen to your old favorites on your phonograph—played through your radio?

It costs very little to install an electric motor and pickup in your old phonograph and connect it to your radio... Then you can have the music you want when you want it, without even bothering to wind a spring. Phone us; we'll be glad to tell you more about it.

YOUR IMPRINT HERE

Street Address Phone Number
City and State or Slogan here

EM9



You Never Realize

how good your all-wave radio set can be until you install a special short-wave antenna system. Let us make a *Certified Installation* of the noise-reducing RCA World-Wide Antenna System. You'll be surprised at the new stations you can get... without noise and interference.

YOUR IMPRINT HERE

Street Address Phone Number
City and State or Slogan here

EM8



CARUSO, RUDY VALLÉE or a SYMPHONY whenever you want them

That old phonograph of yours—for a few dollars we can connect it to your radio so that you can hear your favorite artists through your radio whenever you wish. No springs to wind, and you get the same modern tone quality that you get on radio reception... or with an RCA Victor Record Player you can play records through your radio without ever leaving your easy chair... And it's inexpensive... Phone us today... Let us tell you more about it.

YOUR IMPRINT HERE

Street Address Phone Number
City and State or Slogan here

EM10

THREE CLASSES OF PHONOGRAPH JOBS DESCRIBED

Every Radio Owner is Potential Prospect for Phonograph Job or Record Player

Prospects for phonograph modernization fall into one of three general groups, states W. L. Jones, RCA Parts representative in New York, where many old phonographs are being dusted off, modernized, and returned to duty. First there are those who own a radio receiver only. Second, those who own an old fashioned phonograph and, third, those who own both radio and phonograph. And in each of these three groups there are literally thousands of families awaiting the call of the Service Engineer.

Radio Owners Buy Record Players

With customers who own a radio only, the service engineer's problem is a very simple one. It is only necessary to show him that by attaching a record player and using his present amplifier and speaker he can secure results from records that are in every way comparable to the results he secures over the air.

The quickest, easiest and most satisfactory installation for the customer owning a radio only is the use of one of the turntable and pickup assemblies. RCA Victor Model R-93 is a good example of this type of construction. About the shape and size of a cigar humidor, 5" x 11" x 8", in a handsome walnut case, it may be placed on an end table or other convenient location, enabling the operator to play records at a distance from the receiver to which it is attached. Being electrically driven it does away with the necessity of winding. This unit is known as the RCA Record Player and sells for \$16.50 list, slightly higher west of the Rockies.

Even Radio-less Homes Prospects

A surprising number of old phonographs will be found in American homes. Frequently they have been relegated to the attic or store room. When purchased they were doubtless representative of the finest reproducing equipment that could be obtained, but their day of entertainment has long since passed.

In many homes the unused phono-

NEW USE FOR RCA OUTPUT INDICATOR

Pittsburgh Man Finds Instrument Very Helpful in Selling Tubes in Homes

F. W. Wentker of Pittsburgh, reports that service engineers of that city have found the RCA Output Indicator, Stock No. 4317, to be an excellent device to use to sell tubes.

In his letter Mr. Wentker states that the indicator is first connected in the manner indicated by the instructions. Starting at one end of the circuit, a new tube is then inserted in each socket in turn. As a worn-out tube is replaced by a new one, the sudden increase in brilliancy of the light in the indicator is a convincing demonstration to the customer that the tube needs renewal.

Service engineers have long sought a tube tester which would be light in weight, accurate, and low in price. Mr. Wentker suggests that the RCA Output Indicator will meet this requirement and make it unnecessary to carry an expensive, bulky tube tester.

graph still maintains a place of honor in the living room or parlor, because of the beauty of its cabinet work or perhaps for sentimental reasons. In any event the instrument is still in the home and at little expense can be brought right up-to-date. By pointing out the advances in electric record reproduction, and the small expense involved, it is sometimes possible to sell at the same time a modernization job and a radio set to be used as the phonograph amplifier.

Phonograph Connected to Radio

In countless homes will be found both an old fashioned phonograph and satisfactory radio. Service engineers everywhere are capitalizing the possibilities of this profitable field. No great amount of salesmanship is required to show the advantages of having both instruments in operation, especially when it is made clear to the customer that his records will play through his radio with all the fidelity and definition that characterize the broadcasts that his radio receives.

Phonograph Modernization Pays Well

(Continued from page 1, col. 5)

Modernization Kits are standard units that have made the name "Victor" known throughout the world for recorded music. Each Kit contains a pickup arm, pickup, volume control and, where necessary, a transformer.

Kits Insure Matched Parts

By ordering parts in Kits, the service engineer is sure to get scientifically matched parts as well as a lower price. Motors and turntables, and starting levers are not included in Kits, since they may or may not be required for a particular job.

In announcing the new Phonograph Modernization Kits, G. P. Allen, Sales Manager of the RCA Parts Division, commented on the fact that the increased business in phonograph parts has resulted from the ingenuity of radio service engineers coupled with the demand of the public for "what they want when they want it" in music to supplement their radio entertainment. The public demanded it, and service engineers gave it to them, being quick to see the possibility of meeting the demand for recorded music at small expense by inexpensive changes in old phonographs that were good in their day but which have been outmoded by the advances in record making and reproduction.

Demand for Parts Grows

"Everyone knows that the RCA Victor Company was 'Phonograph Headquarters' even before it became 'Radio Headquarters,'" said Allen. "We have always had a steady demand for phonograph parts, because you know no RCA Victor instrument ever becomes an orphan. We can always furnish repair parts. But during the last few months the demand for pickups, motors, two-speed turntables, and other electric phonograph parts has grown tremendously. At the same time we have been receiving an ever increasing number of inquiries as to what pickup impedance should be used to feed the audio system of a certain radio set, etc."

"A little investigation disclosed that hundreds of service engineers had discovered a profitable new field and were proceeding to cash in on it. Our Phonograph Modernization Kits are the result. Parts may still be ordered individually, but by using the kits the

Radio Rambles



BEFORE FRANCES LANGFORD, NBC CONTRALTO STAR, HAD HER TONSILS REMOVED SHE WAS A SOPRANO!

BRADLEY KINCAID KENTUCKY MOUNTAIN MINSTREL IS AFRAID THE HOME FOLKS WILL FIND OUT HE'S PLAYING GOLF!

LOWELL THOMAS LIVED IN THE CRATER OF A VOLCANO FOR TWELVE YEARS

service engineer can be sure of obtaining parts that are coordinated as perfectly as those used in RCA Victor instruments."

Post Card Solicitation Pays

Many phonograph modernization jobs are obtained when a repair job is done on the customer's radio, but service engineers have discovered that the work is worth going after on its own account and that postcard campaigns or phone solicitation brings profitable results when properly used.

FREE POLISH ON CABINETS HELPS SALES

New York Service Engineer and Furniture Polisher Cooperate For Mutual Benefit

Robert C. Barton, 1041 University Avenue, New York City, has found a new "tie-in" for his business which has resulted in many extra sales. By a co-operative arrangement, he has a furniture polisher come into his store and brighten up the radios he repairs, without cost to himself or the customer.

This idea came from the accidental marring of a console as he was repairing it. After calling in a polisher to remove the scar, he found that all the other furniture in the store was outshone by the polished unit and appeared dingy in comparison. Working on the theory that "a brightly polished cabinet makes a repaired set sound better," he has had the other consoles shined up and it has resulted in many more sales for him.

Extra Service Pleases Customer

When the repaired set was delivered the owner was delighted with the "extra" service rendered by Mr. Barton. She also noticed that the newly polished cabinet made the rest of her furniture appear dull. The result was that the furniture-repair man received the job of refinishing all the pieces in her home.

Mr. Barton writes: "Since then we have been mutually beneficial, as he gives a 'lick' to all my jobs, and in this way he picks up quite a few extra pennies in doing other work for my customers. On the other hand, he has been able to throw some work my way. How do you like that for a 'tie-in'? And a lot of those fellows are out of work."

Plan is Mutually Beneficial

Not only is Mr. Barton giving work to the polisher, but reciprocally, this man has brought him business by bringing in friends who are in the market for new or repaired radios.

This novel method for making old radios look new, and new radios look even better, has been very effective in Mr. Barton's case. Such a co-operative arrangement might be feasible and profitable for many other radio service engineers and dealers.

First Series RCA Service Meetings Highly Successful



The Philadelphia meeting, held in the Architects Club Building, sponsored by the Philadelphia Service Men's Association.



The Cleveland meeting, it is obvious, was a "huge" success.

(Left) Boston service engineers turned out in good numbers to learn more about A.V.C. and the "Magic Brain."

Over 600 service engineers crowded into the Grand Ball Room of the Hotel Pennsylvania, New York, for this meeting.



This large hall in the Detroit Leland Hotel was crowded for the first Detroit meeting.



During August and September, more than 9,000 radio service engineers attended RCA Service Meetings in 129 cities and towns. The discussions were confined strictly to service topics, with "The Theory and Practice of AVC," and the "Magic Brain" getting the lion's share of attention



from the speakers. The third series of the 1934-35 RCA Victor Service Meetings is now under way and the fourth series is soon to come. Service Engineers can learn the dates and places of meetings by consulting their RCA Victor distributors. All engineers and dealers are welcome.

SERVICE TIPS

Win a handsome pigskin wallet. Until further notice, these popular wallets will be given to all whose tips on any phase of radio service are published in this column. Send your favorite idea to RCA RADIO SERVICE NEWS, Camden, N. J.

Service Tips are our readers' ideas, not ours. While RCA RADIO SERVICE NEWS believes they are worth while, we can not be responsible in any way for results obtained.

Lightning Arrestors for World-Wide Antenna

When installing the RCA World-Wide Antenna, make sure you use a lightning arrestor of low internal capacity. Some arrestors have excessive capacity between terminals and affect the normal operation of the antenna system by by-passing some of the signal.

General Electric H-31

In the General Electric Model H-31 I have had a great lot of trouble in a decrease of volume, sometimes no sound at all and at times sounding like someone talking in a barrel.

This can be usually traced to a defective input-output push-pull transformer. The usual set analyzer will not show up the open in the primary of the input transformer on account of the 40,000-ohm resistor shunted across the primary.

R. A. Bromley,
Louisia, Ky.

Vibrator Trouble

When the vibrator of an auto set fails to vibrate and the fuse is O. K., look for a broken lead inside the vibrator case. The constant vibration often causes the wires to break from the vibrator unit. This trouble has been found in several Philco, Crosley, and Motorola sets.

Frank R. Edmonds,
Edmonds Studio,
Dublin, Texas.

Majestic 90

Recently I had a Majestic 90 to service. The complaint was that from 760 to 550 kilocycles, noise was so bad that the set could not be played. Upon examination of the condenser plates, we could find nothing wrong until we used a very high powered magnifying glass. With the aid of the glass we found small (very fine) slivers of condenser plates that were not sheared off clearly when in production.

James L. Smith,
Mahwah Radio Service,
Mahwah, New Jersey.

Radiola 18

Oscillation in R. F. hard to control with R. F. compensating condenser, especially with new RCA-26's. Remove 30,000-ohm resistor in series with B+ and primary of first A. F. transformer and replace with a 50,000-ohm unit. This lowers detector plate voltage slightly but makes for greater ease in adjusting compensating condenser, especially at low volume. I also noted a marked improvement in sensitivity, greater volume and rounder tone, without so much "fringe" noise or whistle on distant stations, due, as I analyzed it, to feed back from detector circuit.

Paul V. Zeyn,
Zeyn's Radio Shop,
West Milton, Pa.

Majestic Model 50

Here is a service kink that took me hours to find and hope it may be useful to other service men.

Turned Majestic Model 50 on but could not get a sound out of it. Voltages all checked O. K. and everything looked O. K.

The set did this two or three times a day and sometimes not for a week.

Remedy: Cut out and replace small uncased .15 mfd. by-pass condenser that goes to 2680-ohm resistor on voltage divider. Recommend high-voltage condenser be used.

Louis Kreisel,
555 Larimer Ave.,
Turtle Creek, Pa.

Majestic Model 70

Here is a good way to get rid of the hum in the Model 70. Replace the 27 tube with a 56, and shield the 56.

J. E. Jones,
40 Park Ave.,
Rochester, N. Y.

Radiola 60 or Philco 77

Volume below normal accompanied by an excessive hum which modulated the output. The tubes, filter and input voltage and current were normal, but the D. C. voltages were low. The trouble was found in the power transformers; one half of the high voltage secondaries was open. A new transformer was substituted in each case.

The addition of technical data to "RCA Service News" makes a good paper better. Keep up the good work.

Henry E. Samuelson,
Norman's Repair Service,
2235 East 75th Street,
Chicago, Illinois.

[Editor's Note—The above is true of all receivers]

Apex and Gloritones—1930-31

When these sets whistle while tuning plus motor-boating and a sustained oscillation in many cases, check all rotor contacts.

Remove the rotor spring contacts, one in each gang section.

Clean with fine sandpaper.

Clean all grime and oil from the surface of the rotor against which the spring presses, using pipe cleaner.

L. W. Abbott,
Radio Service & Eng. Co.,
1004 Sycamore Street,
Niles, Michigan.

[Editor's Note—Another tip that should apply equally well to all sets.]

RCA Victor R-7 and R-9

RCA Victor R-7 and R-9. Poor volume, bad tuning and poor tone in these sets can usually be traced to 14,300-ohm, 2-watt screen voltage resistor and 8,000-ohm, 1-watt bleeder resistors having lost their resistance and becoming as low as 2,000 ohms. Replace 14,300-ohm resistor with 14,000 to 15,000 ohm 2-watt unit and 8,000-ohm bleeder with 1-watt unit. Remove wiper springs from tuning condensers and clean with sandpaper and replace and oil with 3-in-1 or other fine grade lubricant. It may be necessary to align trimmers after cleaning wipers.

J. Block,
197 Nostrand Avenue,
Brooklyn, N. Y.

Replacing Spray-Shield Tubes

Here is a service tip I believe worth while to the average RCA tube dealer who services Majestic receivers using spray-shielded tubes. Sell the customer RCA tubes of the same number and put one of those close-fitting shields (called Goat shields) around the tube. I have been doing this for some time and find that I can get a few cents more and the customer is more than satisfied because he can use RCA standard tubes instead of the harder-to-get spray-shielded tubes. The net cost of shields is only nine cents. Sell 'em RCA.

L. T. Hyer,
759 N. Lincoln Street,
Sabina, Ohio.

Majestic 90

A Majestic 90 was found to be completely dead with no A. C. voltage at the power transformer primary. Checking with an ohmmeter showed an open "ballast coil" or line voltage regulator.

Many cases of this type of service failure are remedied by replacement with a new unit, without opening it up for a further check-up. Inspection of several of these ballasts showed the wire to be open almost directly at the top connecting lug, and were repaired quite easily.

In one case after a repair was effected, the ohmmeter indicated a high resistance value, which was found to be due to oxidation between the top connecting plate and the long screw running through the insulating tubing and connecting one end of the resistance winding to the base prong. Remove the screw and polish up the contact surfaces with a piece of emery cloth.

George W. Jehle,
891 South 16th Street,
Newark, N. J.

Third Series of RCA Service Meetings Starts October 25th

(Continued from page 1, col. 4)

cialists in their respective lines. Following close upon the heels of the major meetings in the larger centers, the meetings for service engineers will be extended to the smaller towns, some 120 field engineers of the RCA Service Division conducting them.

Combinations Featured

The meetings will be of vital interest to every service man who wants to add to his income and store of knowledge. The practical discussion will concentrate on the service problems encountered with radio-phonograph combinations and automatic record changers. The theory and practice of electrical pickups will be discussed and illustrated on the screen. This section of the evening's program should be useful to those service engineers who go after phonograph modernization business as well as those who install and service the newer combination instruments.

Terra-wave police transmitters and the ultra-short-wave equipment will be discussed and practical demonstrations made as to its use and adaptability. It will be shown wherein this type of equipment may be installed at a minimum of expense with relatively low subsequent upkeep. Actual demonstrations of station-house transmitters and receivers and squad-car receivers will be made.

Recent Meetings Highly Successful

The first and second series of service meetings held by RCA Parts and Service Division Engineers established new

Battery Operation Makes RCA Oscillator Popular

Instrument Requires No External Power Supply, Uses Low Drain Tubes and Is Light in Weight

The fact that the RCA Test Oscillator, Type TMV-97-B, is battery operated is making it more and more popular with service engineers of the Pittsburgh region, according to J. E. Heney, RCA Parts Division District Manager in that city.

"A-C, D-C, or battery-operated sets, they are all the same to this oscillator," said Heney. "And frequently this is important, because frequently D-C or battery-operated sets may be located where no alternating current is available. In such cases A-C operated oscillators are of no use in the customer's home and even for simple repairs and alignments it is necessary to take the set to the shop."

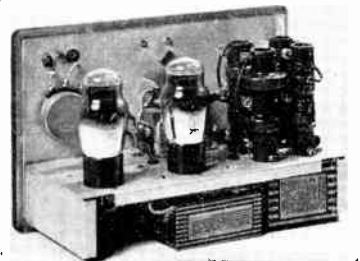
Many Features at Low Price

The RCA Test Oscillator, Type TMV-97-B, created a sensation when it was announced some months ago because of its many features, which might be summed up in the statement that this oscillator meets all requirements of

high records for attendance. Like the coming series of meetings, they were confined strictly to service topics rather than sales topics. All the carefully prepared talks were illustrated by lantern slides or films.

So successful has this type of meeting been that plans are under consideration to extend the schedule of meetings to cover most of the coming year. All Radio Service Engineers and Dealers are cordially invited.

service work, even on the most modern sets, and sells for the extremely low price of \$29.50. At this price accuracy within three per cent is guaranteed. For those wishing positive assurance of extreme accuracy, individually calibrated oscillators, accurate within one



Oscillator Chassis, Showing Batteries

half of one per cent, may be had for \$5.00 additional.

Low Drain Tubes Used

The TMV-97-B Oscillator is powered by a 22.5 and a 4.5 dry battery. Battery type tubes, which draw but 60 milliamperes, are used, giving long battery life. The battery operation feature eliminates all external leads which might require filtering or cause leakage. Thus full portability is combined with wide range (90 KC to 25,000 KC) and light weight, only five pounds with batteries.

The dial, however, is probably its best known feature, since it was the first moderately priced oscillator to have a dial reading directly in kilocycles.

TEAR ON THIS LINE

THE CATHODE RAY OSCILLOGRAPH AS A SERVICE INSTRUMENT

By W. F. Diehl, RCA Victor Laboratory



W. F. Diehl

tion with high-quality servicing of radio sets and other communication devices.

While the cathode ray tube will not replace those essential service tools, such as the test oscillator, the output meter, etc., it is logical to believe that when this modern tube is incorporated in an instrument termed the "Cathode Ray Oscillograph," it will permit the wide-awake service engineer to analyze a receiver more thoroughly and to locate and rectify those troubles which may arise from maladjustment of the multiplicity of circuits now used in high-quality radio receivers to afford superior performance.

The X-Ray of Radio Service

Multi-tube circuits, noise suppression, dual a.v.c., tone compensation, band-pass i. f. stages and new switching arrangements require more accurate trouble-shooting equipment. The complete Cathode Ray Oscillograph, therefore, gives to the service man an instrument comparable in application to the X-ray, now indispensable in the medical and dental field. No doubt, as time goes on, the service engineer will find many new uses for the Cathode Ray Oscillograph so that eventually it may become his most useful tool.

A Complete Cathode Ray Oscillograph

Figures 1 and 2 are views of a complete Cathode Ray Oscillograph using the standard 3-inch tube. This instrument was made up in

the RCA Victor Laboratory in order to determine the applications of such a device to service work. The instrument is very compact, being 10½ inches high, 6 inches wide, 16 inches long, and weighing less than 25 lbs. Even this laboratory instrument is portable.

The major controls are mounted on a front panel with input terminals and auxiliary controls mounted on the side. A single-stage amplifier with uniform frequency characteristics from 20 cycles to 75 kilocycles is incorporated to increase sensitivity in the vertical direction. A similar amplifier is also incorporated to increase sensitivity in the horizontal direction. A switching arrangement is provided so that the amplifiers may readily be thrown in or out of the circuit.

Wide Frequency Range

The timing axis has a frequency range of from 20 cycles to 15,000 cycles, and is controlled from the front panel as indicated by the knobs marked "Range and Frequency." The amplifier feeding the horizontal axes may also be used to amplify the timing axis oscillator. Suitable gain controls are provided so that the height and width of the image may be varied. Provision is made for internal synchronization, external synchronization and both vertical and horizontal



Figure 1—Experimental Cathode Ray Oscillograph

RCA RADIO SERVICE NEWS CUT-OUT SERVICE

TEAR ON THIS LINE

I. R. S. M. MEETING

(Continued from page 1, col. 2)

Company, as well as Dr. A. N. Goldsmith, consulting engineer. Paul McGee, known to thousands of radio service engineers from his work as President of the I. R. S. M., will preside at the meeting. All radio service engineers, radio engineers and dealers are invited.

Cunningham and Goldsmith

Mr. Cunningham's subject will be the "Importance of Service Engineers to the Radio Industry." Out of a wealth of practical experience extending over a period of twenty years, he has had ample opportunity to make observations that will prove interesting and helpful to every radio service engineer who has the good fortune to be present.

Dr. A. N. Goldsmith, world-famous consulting engineer, has chosen as his subject, "Contributions of the Service Industry to the Progress of Radio."

Diehl on Cathode Rays

Thomas F. Joyce, Advertising and Sales Promotion Manager of the RCA Victor Company, will talk on the "Business Side of Radio Service." As one of the ablest advertising and sales-promotion men in the country, knowing the business from all angles, Mr. Joyce will undoubtedly be able to present constructive ideas on a very interesting subject.



E. T. Cunningham



T. F. Joyce

Short-Wave



Clyde A. Crabtree, 1429 East 14th Street, Oklahoma City, is a veteran radio service engineer, with twelve years' experience. He operates a short-wave station in connection with his repair shop, thus obtaining invaluable advertising among laymen as a radio authority. Auto radio service is his specialty, for which he provides drive-in service.

W. F. Diehl, of the RCA Victor Engineering Laboratory, will discuss a subject of vital interest to every radio service engineer—"The Cathode-Ray Tube—Its Development and Practical Application."

Paul McGee to Preside

Remember the date, October 19th; the time, 8 P. M.; the place, Pennsylvania Hotel, New York; the occasion, The Regional Convention of Radio Service Men. Paul McGee, the President of the organization, will preside.

WANTED

Old RCA Radiola Service Notes

Would you like to win a free copy of any of the Bound Volumes of RCA Victor Service Notes (see description in next column)? A few lucky fellows who have kept their old RCA Radiola Service Notes booklets containing circuit diagrams can trade them in for any of the new Bound Volumes they choose.

For the preparation of the new Bound Volumes, service notes containing circuit diagrams are needed on the following RCA Radiolas. These sets were all manufactured about 1922 and 1923:

- Model ER-753—Crystal receiver.
- Model AR-1375—Crystal receiver.
- Model DA—Detector and two-stage amplifier.
- Model RA—Regenerative receiver.
- Model RC—Combination RA and DA.
- Model RF—Detector and one audio stage.
- Model RE—Aeriola Junior.
- Model RF—Aeriola Senior.
- Model RG—RCA Aeriola Grand.

Only two Service Notes are needed for each of the above models. For the first two copies received on any model, the RCA Parts Division will give each of the senders one of the Bound Volumes. Send your old Service Notes on the above models to J. P. Allen, RCA Parts Division, Camden, New Jersey. Hurry, because only the first two booklets received on any model will win a Bound Volume of Service Notes.

ALL RCA VICTOR SERVICE NOTES NOW AVAILABLE IN FIVE BOUND VOLUMES

All Service Notes and Diagrams on RCA Radiola, Victor, and RCA Victor Models Now Offered in Book Form at \$1.00 per Book

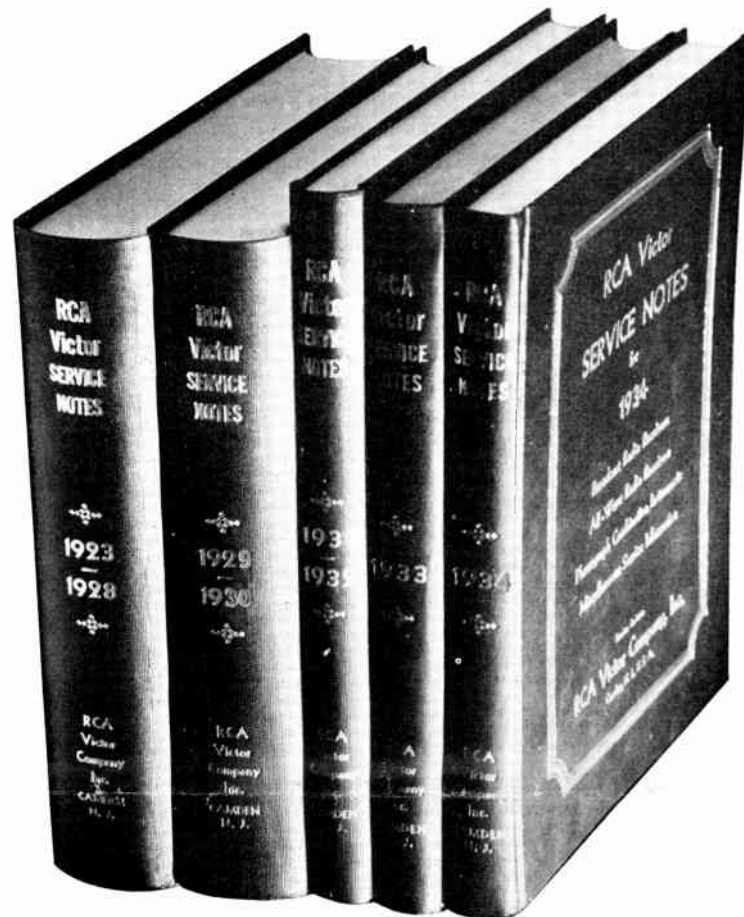
So immediate was the acceptance of the bound volumes of RCA Victor Service Notes for 1931-32 and 1933, so strong was the demand, that three additional bound volumes of service notes will be ready shortly for distribution.

Like the first two volumes, the new books are sold at one dollar each by RCA Parts Distributors. For \$5.00 any radio service engineer can now have a complete library, comprising five uni-

volumes already in their possession have proved their worth as time-savers repeatedly. Hence the demand for the additional volumes.

Diagrams Lie Flat

When the Service Engineer wants technical information on any RCA Victor model, he turns to the index of his bound volume; a moment later dia-



formly bound volumes, of technical data on all RCA Victor radio receivers, past and present.

Books Cover 1923 to 1934

The 1923-28 Volume contains service notes for all RCA Radiola models issued during those years, all Victor Talking Machine Company models which contained radio units, and all RCA Victor models. The 1929-30 volumes include service notes on all models manufactured by either the Victor Division or the RCA Radiola Division in those years. All RCA Victor models for the current year are covered in the 1934 volume. Due to the smaller size of the early service notes, the 1923-28 and 1929-30 books are slightly less in height than the other volumes.

Service men have asked that these additional books be supplied. The two

grams, parts lists and prices and service notes are lying flat on the table before him.

There is no profit made by RCA in the sale of these books, but there is great satisfaction in supplying them for the convenience of Dealers and Service Engineers.

Other Data Included

In addition to the above, each volume will contain other valuable information such as impedance, inductance and capacity charts, antenna charts for short-wave receivers, reception charts for time and season of short-wave bands and complete data on all types of RCA Radio Tubes.

A limited edition is being published. To make sure of copies for yourself, we suggest that you place your order now.

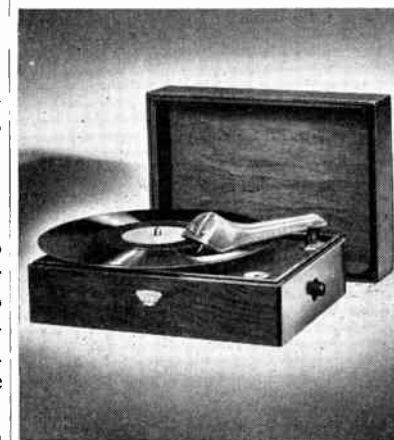
RECORD PLAYER IS GOOD ITEM FOR SERVICE TRADE

Small, Low-Priced Unit is Used for Demonstrating in Homes

Compact, rich in appearance, adding dignity and refinement to any room, the new RCA Victor Record Player is sweeping into national popularity, making immediate profits for dealers and service engineers and paving the way for future record sales.

The RCA Victor Record Players, in spite of their low price—only \$16.50 list, east of the Rockies—are equipped with genuine RCA Victor pickups especially designed to combine compactness with efficiency. The pickup includes as its major new feature a viscoloid damper on the armature which effectively prevents unwanted

pickup and tone-arm resonance, otherwise a source of distorted tone. The inertia tone arm to which the pickup is attached is carefully balanced to insure proper tracking of the record grooves without undue wear and vibration.



RCA Victor Record Player

For the service engineer who is cashing in on the opportunities offered by Phonograph modernization, the RCA Victor Record Player is his best demonstration unit as well as a fast selling merchandising item.

TEAR ON DOTTED LINE

CATHODE RAY OSCILLOGRAPH (Continued)

beam shift, so as to obtain a standing image with proper framing.

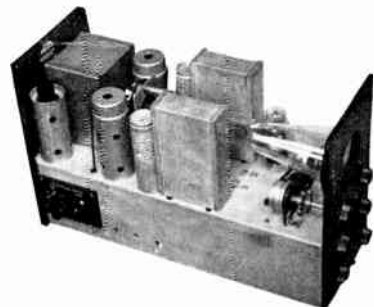
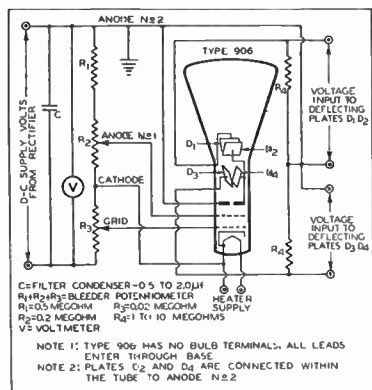


Figure 2—Interior of Laboratory Type Cathode Ray Instrument

Applications

1. All A-C voltages from a 1/4 of a volt to 1000 volts can be seen and measured. Since the input impedance to the device is extremely high, readings are considerably more accurate than those obtained with a meter and there is no danger of burn-out. The complete power source of radio receivers or other equipments can, therefore, be completely analyzed and trouble in filter circuits, chokes, condensers, voltage dividers, etc., located rapidly.
2. Frequency and magnitude of hum can be viewed and measured.
3. The audio frequency circuits can be analyzed for harmonic content and linearity.



Typical Cathode Ray Tube Circuit Using RCA-906 Tube

4. Complete i.f. system, both individual stages and overall, may be lined up so as to give the proper band width, thereby avoiding side band cut-off with loss of fidelity. This phase of servicing has been neglected, due to the excessive cost of oscillographs in the past.
5. Complete circuits may be analyzed and various wave forms studied, with the result that the cause of trouble in various networks may be located more rapidly and accurately. The wave form of service test oscillators can be analyzed and the oscillator adjusted rapidly when required.

The analysis of circuit performance is very rapid and accurate, as indicated in Figure 3. Here on the screen of the

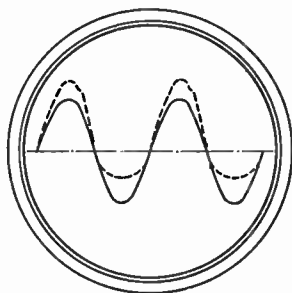


Figure 3—Undistorted and Distorted Curves

cathode-ray tube we see two complete cycles of an audio frequency sine wave (heavy solid curve) which is undistorted. The dotted lines indicate the image we would see if distortion were present in the audio circuits. It is to be noted that the lower half of the dotted curve wave is flattened out, indicating severe distortion. By means of the various controls it is possible to amplify the image horizontally and vertically so as to have the entire area of the screen occupied by a single cycle or fraction of a cycle.

Applications of a Cathode Ray Oscillograph to general service work are too numerous to mention. Many new applications will be found when and if the service man takes up the use of the Cathode Ray Tube to solve his problems.

RCA RADIO SERVICE NEWS CUT-OUT SERVICE

TEAR ON DOTTED LINE

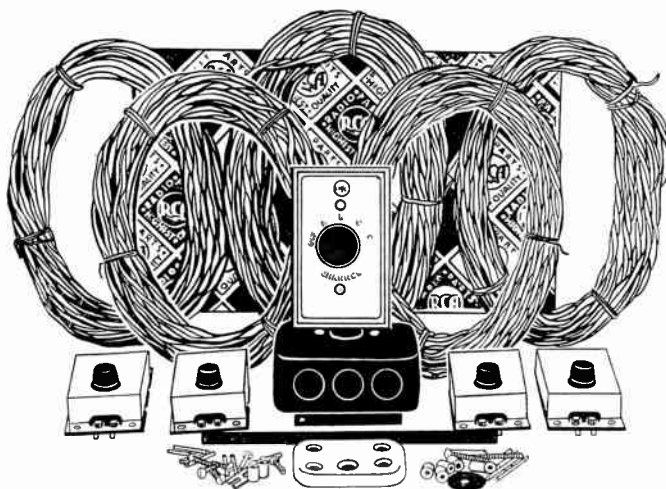
SEE YOUR RCA PARTS DISTRIBUTOR

For These Fast-Selling Service Items and RCA Test Instruments and Tools as well as Genuine Factory-Tested RCA Parts

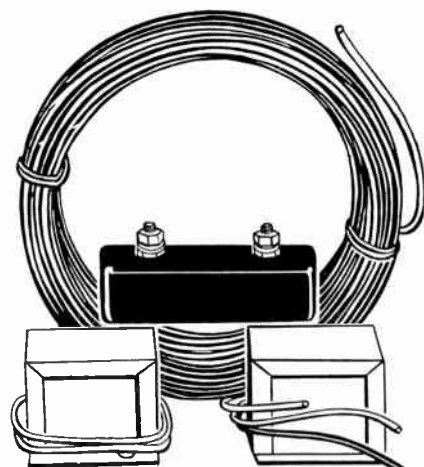
THE FAMOUS RCA ANTENNA SYSTEMS



RCA World-Wide Antenna System. Provides, primarily, an efficient means of collecting the shorter-wave signals on a special "double doublet." Excellent for stimulating sales of short-wave and all-wave receivers—and for keeping the customer satisfied after they are installed. Stock No. 9500. List price, \$6.00.



Store Demonstration Antenna System. Possesses all the advantages of the World-Wide Antenna System, and also includes a four-way switch, mounted on the wall, for rapid changes of antenna from one receiver to another, accommodating up to four receivers. Stock No. 9504. Price, \$9.85 net to the dealer or service engineer.



RCA Standard Shielded Antenna System. For installations where the utmost in efficiency throughout the broadcast and police bands only is desired. Stock No. 7718 Antenna Kit has both an antenna transformer and a receiver coupling transformer. List price, \$5.00. Stock No. 7717 contains no receiver coupling transformer. List price, \$3.50.

AUTO RADIO ACCESSORIES

The sale of a set is not complete unless the customer is satisfied. Noisy reception makes a dissatisfied customer . . . a customer who more than likely will go elsewhere the second time for his merchandise and his service. When you sell a set, sell the makings of a satisfactory installation along with it . . . sell an RCA World-Wide or Shielded Antenna System. The RCA Auto Radio Lock and Instrument Panel Control Unit are two other items that make for permanently satisfied customers.



RCA Auto Radio Lock. Foils the auto-radio thief. Similar in principle to a spare-tire lock, fitting over the bolt holding the receiver to the bulkhead of car. Good on all radios in any make of car. List price, \$1.35. Stock No. 4575.



Instrument Panel Control Unit. Often preferred to steering column control. Designed for RCA Victor Models M-107 and M-123, on Ford and Chrysler-made cars. May be adapted to other cars. Chromium finish. Suggested net price to dealers, \$1.50. Stock No. 4476.

REMARKABLY ACCURATE TEST OSCILLATOR FOR ONLY \$34.50



RCA Oscillator. Type TMV-97-B. An excellent oscillator at a low price. Features include an extremely wide frequency range—(90-25,000 K. C.), a direct-reading dial marked in kilocycles and a direct-reading range switch. Light, compact and reliable. \$29.50 net to service sales engineers.

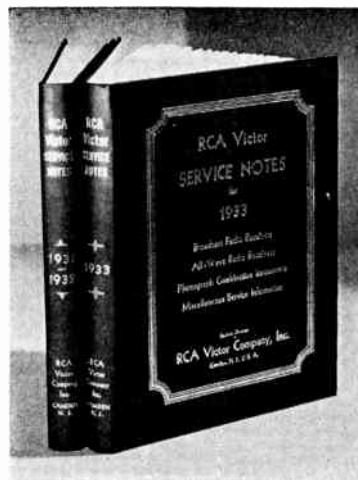
Individual Calibration Chart. The Individually Calibrated RCA Oscillator may be obtained for only \$5.00 additional, giving a remarkably accurate test oscillator for only \$34.50.

THE PROFESSIONAL TOUCH

You can make your work easier, give your customers the best and at the same time impress clients with your professional equipment and workmanship, by owning the items shown here. Bound Volumes of RCA Service Notes eliminate guesswork. RCA Test Equipment and Special Tools will assist you in building a local reputation that in turn will increase your profits.



RCA Output Indicator. Type TMV-121-A. Consists of a Neon lamp, a transformer and a potentiometer, all mounted in a bakelite case. Has no delicate parts. Ideal for "peaking" receivers. Stock No. 4317. Price, \$4.00 net.



RCA Victor Service Notes. Five bound volumes, 1923-28, 1929-30, 1931-32, 1933, and 1934 (only two shown above). Each volume contains all the Service Notes printed for the receivers manufactured during the year, or years, indicated. Net price per volume, \$1.00.

PRECISION TOOLS FOR USE WITH THE TEST OSCILLATOR

Tuning Wand



Alignment Tool



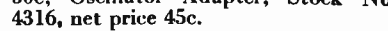
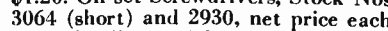
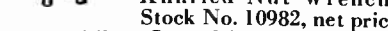
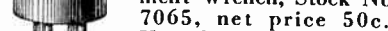
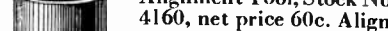
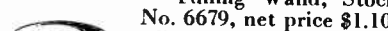
Alignment Wrench



Knurled Nut Wrench



Off-Set Screwdrivers



Tuning Wand, Stock No. 6679, net price \$1.10. Alignment Tool, Stock No. 4160, net price 60c. Alignment Wrench, Stock No. 7065, net price 50c. Knurled Nut Wrench, Stock No. 10982, net price \$1.20. Off-set Screwdrivers, Stock Nos. 3064 (short) and 2930, net price each, 50c; Oscillator Adapter, Stock No. 4316, net price 45c.

Telling the World

Foreign Reception

NOISY?

ALL-WAVE SETS

Need this Special

ANTENNA

Now you can get the fascinating short-wave programs from more foreign stations as free from noise as domestic programs. RCA engineers, leaders in long distance radio communication, have perfected an all-wave antenna system that gives much greater signal pick-up than an ordinary antenna.

Specially designed to free short-wave reception from interference from autos, motors, and other man-made static. Insures greater volume with less noise. Improves standard broadcast reception. Price \$7.00. Ask your dealer or service engineer today to make a *Certified Installation*.



Above is shown one of the RCA World-Wide Antenna advertisements that appear regularly, week in, week out, in *Radio Guide*, the publication that goes to over 350,000 radio listeners. Since the above ad was run, the price of the antenna has been reduced to \$6.00.

PENCIL GIVEN FOR ANTENNA KIT LABELS

(Continued from page 1, col. 1)

veniently to interpret the color code. By simply arranging the three colored bands to correspond with the colors shown on the resistor, he can instantly read the indicated value of the resistor in plain figures.

The RCA Service Engineer's Pencil is a service engineer's pencil—a pencil that any service engineer will be proud to own not only because of the beauty and usefulness of the pencil, but because it will mark him as a radio service sales engineer, a radio technician who has helped himself and his customers by selling at least ten of the famous RCA World-Wide Antenna installations.

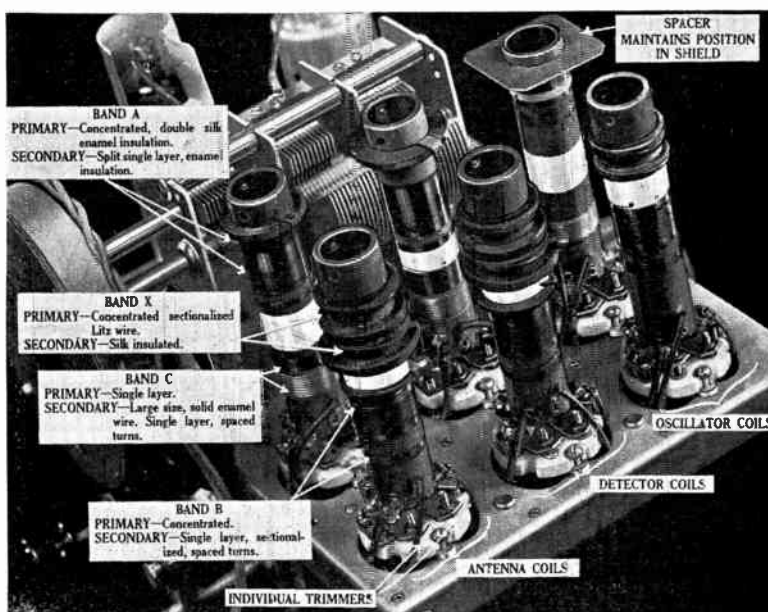
Exclusive with RCA

"We are not in the pencil business," said E. M. Hartley, RCA Parts Division Manager, in commenting on the pencil offer. "The RCA Service Engineer's Pencil is exclusive with us and is not for sale. Few service engineers would care to pay that much for a pencil. Our special pencil was specially designed to meet a real need, and we want as many members of the profession as possible to own one."

Ten Antenna Sales Win Pencil

"There are two labels on each RCA World-Wide Antenna System Kit, and one label on each RCA Dealer Demonstration Antenna Kit. Therefore, to make the dealer unit count as much as two home units, we have specified that each label from the dealer unit shall count as much as four labels from the regular home kit. Thus a pencil could be won for two labels from the dealer demonstration kit, plus 12 from the regular kit. All any service engineer has to do is send in the required number of labels to the RCA Parts Division, Camden, New Jersey, plainly marked with his name, and he will receive promptly one of these desirable gifts."

Magic Brain, But R. F. Unit to You



Above is shown the marvelous device that is rapidly becoming famous with the public as the RCA Victor "Magic Brain." To radio service engineers, however, who recognize superior design and precision manufacture, it is the R. F. Unit—but what an R. F. Unit!

Tentative Dates RCA Service Meetings

	3rd Series	4th Series		3rd Series	4th Series
Albany - - - -	Oct. 22		Detroit - - - -	Oct. 31	Nov. 28
Newark - - - -	Oct. 26		Des Moines - - -	Oct. 31	Dec. 28
New York - - -	Oct. 19		Toledo - - - -	Nov. 2	Nov. 30
Philadelphia - -	Oct. 30	Nov. 27	Grand Rapids - -	Nov. 5	Dec. 3
Richmond - - -	Oct. 22	Nov. 26	St. Louis - - - -	Nov. 7	Dec. 7
Washington - - -	Oct. 24	Nov. 28	Kansas City - - -	Nov. 5	Dec. 5
Baltimore - - -	Oct. 26	Nov. 30	Lincoln or Omaha	Nov. 2	Dec. 3
Cincinnati - - -	Oct. 22	Nov. 19	Peoria - - - -	Nov. 9	Dec. 10
Indianapolis - -	Oct. 24	Nov. 21	Minneapolis - - -	Nov. 12	Dec. 12
Columbus - - -	Oct. 26	Nov. 23	Milwaukee - - - -	Nov. 14	Dec. 14
Cleveland - - -	Oct. 29	Nov. 26	Chicago - - - -	Nov. 26	Dec. 17

Consult RCA Victor Distributors for exact date and place of meeting

SILENT SALES-MANSHIP SELLS REMODEL JOBS

Southern Dealer Sells Phonograph Modernization Jobs by Using Record Player for Final "Test"

A New Orleans service engineer has developed a clever method of getting phonograph modernization business. He simply lets the customer sell himself!

The idea behind it is not protected by patents or copyrights, and any service engineer may use it as freely and as profitably as the man who first worked it out.

Carries Record Player

The secret of his plan is that whenever he enters a customer's home he carries with him an RCA Record Player—it weighs only 8½ lbs.—and a few good records. When he installs a receiver on which he has worked, whether the work was done in the home or in the shop, his last step, after making the usual antenna and ground connections, is to connect the RCA Record Player to the audio system of the receiver. Usually this is done by means of tube wafers.

Without saying anything to the customer he proceeds to place a record on the turntable and starts the instrument playing. Possibly the customer has been watching the whole process, but if not, his attention is attracted by the new form of entertainment he is now getting from his radio—entertainment that is free of all static and station announcements.

Customer's Interest Aroused

In response to the customer's inquiries, the service engineer explains that he is simply playing one of the new type records through the radio as a final check on the repair job. This convinces the customer of the thoroughness with which the repair work was done, but also it has an even more profitable result. The service engineer mentions, quite casually, that at a very small cost he can arrange it so that the customer can have recorded music whenever he wishes. Almost invariably the customer shows some interest.

The enterprising service engineer then proceeds to explain the possibilities either of the RCA Record Player or of a modernization job on the old phonograph the customer may own. He explains the great difference that recent advances in the science of recording have made and stresses the fact that the customer is losing half of the enjoyment of his radio receiver if he cannot supplement his radio entertainment with recorded music. Almost every family has a stack of records of which they are very fond. The service engineer capitalizes on this by explaining that by the electrical pick-up method of reproduction they will sound even better than they did in the old days.

No High-Pressure Methods

In this entire method of presentation no high-pressure salesmanship is involved. The service engineer has been playing the part of the sales engineer, but with such a nicety of purpose and refinement of procedure that the customer sells himself in a surprising number of cases.

Attend the
**RCA VICTOR
SERVICE MEETING**
nearest you

Ask your
RCA Victor Distributor
for Date and Place

THE CITY WITHIN A CITY—"RADIO HEADQUARTERS"



Across the river from Philadelphia, in the shadow of the great Delaware River Suspension Bridge, stands "Radio Headquarters," one of America's great research and manufacturing establishments.

Not all of the buildings shown above are part of the RCA Victor plant—but most of them are, and not all the buildings of the RCA Victor plant appear in the above view.

At the river's edge, at the left of the picture, can be seen the huge coal pockets that supply the private power plant, which has enough capacity to handle a city of some size. In the center can be seen the large conduits of the elaborate dust-removing system. At right center appears the eight-story office building that houses the RCA Victor Company administrative offices.



RADIO SERVICE NEWS

PUBLISHED · IN · THE · INTEREST · OF · RADIO · SERVICE · SALES · ENGINEERS

MARCH, 1938

CAMDEN, NEW JERSEY

Vol. 4, No. 2

TUBE CONTEST ANNOUNCED

NEW RCA TEST OSCILLATOR IS A-C OPERATED, SELLS FOR \$29.95

Big Easily-Read Dial And Accuracy of 2% are Other Features of New Instrument

Low price and complete a-c operation distinguish a handsome new RCA Test Oscillator No. 153 which makes its bow to the trade this month.

RCA Test Oscillators have been popular ever since the old Model 97 made laboratory accuracy and light weight available in an instrument priced to fit the needs of service men. Despite the fact that RCA Oscillator No. 153 has several new features and is of traditional RCA quality, the price of \$29.95 is the lowest at which an RCA Oscillator has ever been offered.

Nothing has been overlooked to make this oscillator ideal for service use. The size and weight make it suitable for use in the customer's home as well as in the shop. The control panel with its large dial is designed both for convenience to the operator and impressiveness to the customer.

Greater Accuracy

The full-vision airplane-type dial, 6½ inches in diameter, covers over 50 inches of dial scale length in the six bands. Accuracy of calibration is within 2%. The fundamental frequency range is 100 kc to 30,000, ample for servicing all home receivers. For ultra h-f testing, harmonics of the last band may be used. Other features of the No. 153 Oscillator are:

1. Completely a-c operated.
2. High RF Output. (1.0 volt). Essential for locating trouble on an inoperative or completely misaligned set or for single stage alignment work.
3. Three attenuator taps plus fine control giving continuous

(Continued on Page 6, Column 3)

Television Parts Announced To Experimenters

Fascinating New Field Of Operation Is Opened To Amateurs

In line with RCA's policy of encouraging amateur interest in television and cooperating with those amateurs who may wish to experiment in this fascinating field, the company has now made available to amateurs certain specialized television parts that would be difficult to obtain elsewhere.

In announcements in RCA Radio Service News and other leading trade papers, RCA recently explained the present status of television and offered amateurs for the first time two television receiving tubes, RCA Kineoscopes (Registered Trade Name) Nos. 1800 (9-inch) and 1801 (5-inch) priced at \$60.00 and \$40.00 respectively. The parts now offered to amateurs are for use with these two tubes.

Folder on Request

An illustrated sheet describing the parts and giving wiring dia-

(Continued on Page 7, Column 4)

Poor Charlie!



What is this strange power Charlie McCarthy has over women? Charlie appears not to entirely approve of the actions of Andrea Leeds, another NBC performer—and if he really doesn't we are at last convinced he really is a dummy

FRANCHISE PLAN ADOPTED FOR COMMERCIAL SOUND DEALERS

RCA Authorized Dealers Will Have Many Selling Advantages; Applications Being Received

New Window Display For Tube Dealers

First Unit Of New Service Is Ready For Shipment

Striking window displays throughout the year are now available in the 1938 radio tube display service, according to Forrest E. Crain, in charge of Radiotron advertising.

"With our new window display service and a supply of window display cards, you have attractive windows 12 months of the year," said Crain, in describing the service before a recent meeting of RCA radio tube distributors. "The 'walking' figures of the first unit, which is now ready for shipment, never fail to attract attention in a window, and they can be used in a thousand different ways, in groups or in conjunction with other store merchandise. They add life to any window

(Continued on Page 4, Column 5)

A rare opportunity is now open to a limited number of people to become Authorized Dealers in RCA Commercial Sound Equipment. A plan recently inaugurated will give several valuable advantages, including a protected territory and exclusive merchandise, to those who can qualify.

"The selling and renting of commercial sound amplification equipment is a specialized business and needs a special type of dealer, although by no means need the dealer specialize exclusively in this field," declared W. L. Rothenberger, Manager of RCA Commercial Sound Section, in announcing the new plan. "The business is growing so rapidly that there is a real opportunity for a limited number of dealers to feature commercial sound work and to become known in their communities as headquarters for this type of equipment."

"In the commercial sound business there is particular need of close cooperation between factory, distributor, and dealer. We are therefore encouraging our distributors to select outstanding dealers or service shops to be Authorized RCA Commercial Sound Dealers.

Dealers Benefit

"These dealers will receive many benefits. Only a limited number of dealers will be chosen, thus giving each Authorized Dealer a protected territory. Exclusive RCA mer-

(Continued on Page 6, Column 3)

Big Prizes For Letters About Metal Tube Jobs

Modernization Contest Starts At Once; Ends April 30th

How would you like to win, absolutely free, a wonderful assortment of the famous RCA Test Instruments—five major service instruments and an assortment of small tools totaling \$250.00 in value? That's the reward you'll get if you are the first prize winner in a new contest being sponsored by the Radiotron Division of the RCA Manufacturing Company, Inc.

It is called The RCA Modernization Contest and you don't have to buy anything, save labels, or work puzzles. All you have to do is write a winning letter about a type of service job that radio service engineers are doing every day at a nice profit to themselves.

The RCA Modernization Contest was designed to help the service shops and dealers who are cashing in on the market created by the improved performance obtained in radios which have been changed over from "G" type (octal base and glass envelope) to all-metal tubes. Hundreds of dealers have discovered that their customers are eager to have their radios modernized for metal tubes when they are told how little it costs. RCA wants to know how these sales are being made and how the work is being done, and they are willing to pay well for the information.

Corresponding Types

Nine popular types of all-metal tubes are replacements for corresponding "G" types so far as general characteristics and bases are concerned. To obtain the improved performance from the better shielding and sturdier construction of the metal tube, all that is necessary is to slip the metal tube into the socket or make minor trimmer readjustments for the several types used in radio frequency sections of the receiver.

These interchangeable types are as follows:

6A8G—6A8	6F5G—6F5
6L6G—6L6	6H6G—6H6
6L7G—6L7	6J7G—6J7
6F6G—6F6	6K7G—6K7
6J5G—6J5	

Plenty of Prizes

The first prize is a dream: five famous RCA test instruments plus all the small RCA bench tools; fourteen units in all valued at over \$250. The winner gets his choice of any five RCA test instruments, not including however the large laboratory type 9" oscillograph.

The second prize is a complete Home Study course in the RCA Institutes, oldest and best known of the nation's radio schools. The winner of this second prize may choose any of the Institutes' three courses:

The Radio and Sound—regular

(Continued on Page 5, Column 4)

AC Operated Oscillator



Newest member of the famous RCA family of Test Oscillators is No. 153, shown above. It is distinguished by its high degree of accuracy, wide range, large dial, and low price of only \$29.95. It is entirely a-c operated

ANTENNA STOPS INTERFERENCE FROM HIGH LINE

Magic Wave Antenna Gives Good Reception In Bad Spot, Says Dealer

For perfect reception under adverse conditions, install an RCA Magic Wave Antenna suggests B. L. Hinnant, of the Columbus Motor Company, Whiteville, S. C., who supports his suggestion with a report of his actual experience using this remarkable antenna system.

"We want to drop you a line in praise of your new Magic Wave Antenna," wrote Hinnant in an unsolicited letter to the RCA Manufacturing Company. "We have a customer who lives about 300 feet from a 60 kv line and who is fed from a transformer operating on a 4,000-volt primary derived from this same line. For five years radio reception was an impossibility with either a battery or an electric radio. Today we tried an 86BK (an RCA Victor battery receiver) with



Magic Wave Antenna Kit

the conventional antenna, locating both the radio and the antenna in the most favorable spot in the house with respect to the power line, and it was impossible to even hear anything but a station background of speech.

Magic Wave Solves Problem

"The writer then erected one of the RCA Magic Wave Antennas on two 40-foot poles, all work being done in accordance with the instructions furnished. The antenna was located 75 feet from the house. Reception was perfect with the battery set and equally good with the electric set. Needless to say we sold him a nice electric."

Columbus Motor Company
B. L. Hinnant

Other Features Praised

Splendid performance is only one of the features that service engineers are enthusiastic about in their comments on the Magic Wave Antenna, according to L. A. Goodwin, Jr., of the RCA Parts Sales Department, who receives many unsolicited letters praising this new RCA achievement in antenna systems. "Performance is the first consideration, of course," stated Goodwin, but the adaptability and ease of installation of the Magic Wave antenna have also made a big hit with the men who have to erect them. This antenna can be adapted

LOW PRICED RADIOS ADDED TO RCA'S LINE

Electric Tuning Now In Small Radios; Two Sets Have No Dial

Announcement of a number of outstandingly low-priced RCA Victor instruments, with Electric Tuning and other features, was made by Paul C. Richardson, Manager of the Radio and Phonograph Division, following three regional meetings for RCA Victor wholesalers in Philadelphia, Chicago and San Francisco.

Included in the new series are a 4-tube AC-DC table model; two extremely compact Electric Tuning table models; and a 5-tube AC Superheterodyne table model, all under the \$20.00 price bracket. There is a 6-tube chest type model selling for \$39.95 as well as a 6-tube electric tuning table model at \$49.95. A 7-tube electric tuning radio in both table and console types, sells for \$69.95 and \$89.95, respectively. The prices are all F. O. B. Camden, N. J.

At the meeting, Mr. Richardson announced an increase in the list price of the 87K-1 from \$89.95 to \$99.95. Two exceptional values in phonograph-radio instruments were also presented by Mr. Richardson in the U-106 and U-108 models, with automatic record changing mechanisms for both 10" and 12" records. The U-106 is priced at \$199.95 and the U-108 will be priced as a companion instrument to RCA Victor's U-109, which sells for \$450.00.

Distributors Enthusiastic

All of the new models were enthusiastically received by the wholesalers at their premier showings in the three cities. At the Philadelphia meeting, Henry C. Bonfig, Commercial Vice President, outlined the Company's merchandising program. He was followed by Mr. Richardson who presented the new home receiver models. Jack C. Marden showed five new auto radios, ranging in price from \$19.95 to \$59.95 which had been announced a short time before.

E. W. Butler, presented the new phonograph-radios and Ted Wallerstein, Record Sales Manager, discussed the opportunities in the musical merchandising field. T. F. Joyce, RCA Victor Advertising Manager, reviewed the Company's advertising and sales promotion for the past year, and D. J. Finn presented the promotion program for the new merchandise. Fred Wilson, Manager of Field Activities, acted as master of ceremonies for both the Philadelphia and Chicago meetings. The same RCA Victor executives

to any type of job—vertical or horizontal signal collector may be used and the antenna proper may be anywhere from 20 to 120 feet long.

A Hit



RCA Victor's newest sensation, this dial-less radio that brings you your six favorite stations at the touch of a button, has made a big hit wherever shown. This is Model 94X-1; it's priced surprisingly low

conducted the Chicago meeting, and James W. Cocke, Western Division Manager, and Tom Joyce divided the presentation duties in San Francisco.

94X-1 and 94X-2 Have No Dial

The model that attracted the most attention was the 94X-1, a compact four-tube AC-DC receiver with six push buttons, housed in a cabinet measuring only about 8" x 8" by 6". There is no dial and all the controls, including one for volume, are on top of the case. The pre-selected stations are indicated on the buttons. Other features of this model are a built-in antenna and electrodynamic speaker. The list price of this as well as all the other 4-tube table models and the 5-tube set will be announced locally by the wholesale distributor in each territory. The same 4-tube chassis is also available in a maple cabinet, with a "waterfall" roll top. This is Model 94X-2.

The 94X is a 4-tube, AC-DC operated receiver, with conventional manual tuning. This model has a clock-type dial. Also in the lowest price bracket is the model 95-T, a 5-tube AC operated superheterodyne of the chest type, with a rectangular clock-type dial. Model 86-T-2, selling for \$39.95 is a 6-tube table model with unusual performance features, in a chest-type of cabinet, rounded at one end for extra smartness in styling. It has RCA's straight-line dial.

Another sensational table model now in the RCA Victor line is the Model 86T-6. Although this instrument has the modern small chest-type cabinet, it includes electric tuning with six-button instantaneous electric tuning, straight-line dial, and a six-tube three-band superheterodyne circuit. The list price is only \$49.95, F. O. B. Camden.

Distributors showed great interest in model 87T-2, an Electric Tuning radio with seven tubes, straight-line dial, and Magic Eye tuning indicator. This instrument lists at \$69.95 F. O. B. Camden. 87K-2, is a 7-tube superheterodyne with three bands and the same features as the 87K-1 model which RCA Victor announced several weeks ago. It is enclosed in a different style of cabinet, and has RCA Electric Tuning, at a list price of \$89.95, F. O. B. Camden.

Low-Priced Combinations

The two new phonograph-radios are equipped with automatic record changing mechanisms to accommodate both 10" and 12" discs. They utilize a new "feather weight" true-tracking crystal pick-up. The U-108 is a deluxe instrument, with Electric Tuning, higher-fidelity tone quality, a dynamic expander, Magic Voice and many other distinctive features. This 16-tube instrument incorporates every modern feature for complete home entertainment, and is housed in a luxurious cabinet designed after the Adam furniture period.

The U-106, is a 9-tube combination which brings high-quality record reproduction and radio reception into the home at a new low price for its value. All the controls, including the dial and the Electric Tuning push-buttons are concealed under a spring-balanced lid of a down-to-the-floor cabinet of substantial proportions. Priced at \$199.95, the U-106 represents the biggest phonograph-radio value in RCA Victor history, Mr. Richardson said.

Public Favors New Forms Of Auto Antennas

Orders Prove Owners Approve Streamlined Auto Aerials

That the public "goes for" auto antennas that are attractive as well as efficient is proved by the way orders have piled in for the recently announced new RCA Auto Antennas, states J. A. Milling, Sales Manager of RCA Parts Department.

"The early auto antennas were tolerated but not approved by car owners. This is proved by the hit our new streamlined antennas have made. We have had many reports from dealers indicating that they have discovered that they can sell the new antennas not only to purchasers of new auto radios but also to people who want to eliminate their present unsightly aerials. And the smart appearance of the new streamlined auto antennas is making it easier to sell not only antennas but also the auto radio itself.

Monogram Aerial Popular

"The RCA Monogram Antenna and the Cowlenna seem to share equally in public favor, with the Rodenna that fastens on the hinge and the old-reliable Di-Pole for running board installation not far behind.



Monogram Antenna

"The Monogram Antenna, although the highest in price—\$4.95 list—has the edge on any of the other types in popularity. This is probably because it preserves perfectly the symmetry of the car's lines and is so easy to install. The telescopic sections allow it to fit any car and the top section is held in place by a cemented cup—no drilling required.

Advertising Stunt

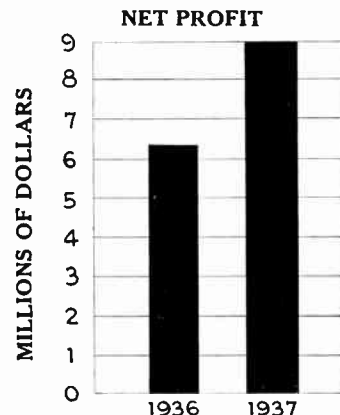
"The Cowlenna, at \$3.65 list, and the Rodenna, at \$2.75 list, also make very attractive installations. For the owner that wants an antenna that's out of sight and out of mind because it's highly efficient, the Di-Pole at \$2.60 continues to be the best buy.

One dealer wrote us that he got some good advertising—and some business—by mounting a sign run-

RCA SALES UP 11 MILLION, REPORT SHOWS

Company Moves Ahead with Better Earnings for 1937

The confidence placed in RCA by its customers, distributors, and dealers, as well as the hearty acceptance of the newest thing in radio—Electric Tuning—were responsible for an increased sales volume of over \$11,000,000. This is reflected in both the 11% increase in gross income and 46% increase in profits



reported in the annual statement of the Radio Corporation of America. The increase in net profits is largely a reflection of more efficient operation, both from the standpoint of distribution of its products and introduction of products having greater public acceptance.

Smart dealers can read between the lines of the RCA Annual Report and find this their opportunity to make more profits, because only as their dealers prosper can RCA prosper.

ning lengthwise on the top of his car and right behind his Monogram



Cowlenna

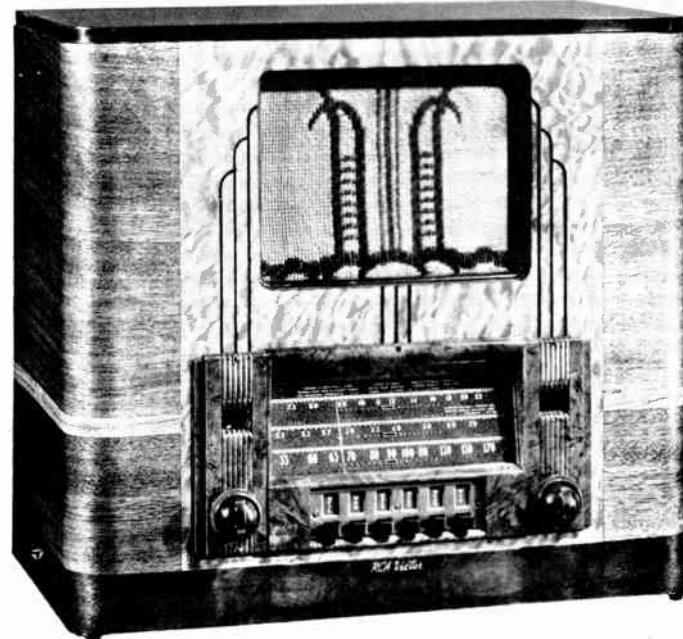
Antenna. The sign read, 'An antenna like this on your car, \$6.00.' Not a bad idea, is it?"

Silas Egglemud



"Is the boss dumb! I told him I'd fixed the trimmers and he said it served the dirty gyps right."

Console Features In Table Model



Electric Tuning, automatic volume control, and the easily-read Straight Line Dial are only a few of the features of RCA Victor's new Model 87T-2 shown above. It brings reliable electric tuning with automatic volume control to the low price field

SHOP NOTES

FROM RCA SERVICE DIVISION

To keep the readers of Radio Service News posted on the latest changes in and additions to RCA Products and technical literature, the RCA Service Division will report changes in this column from time to time.

To get the most benefit from this column it is recommended that the readers of RCA Radio Service News transfer these changes and additions directly to their Service Notes on the particular model. By doing this, you are assured of always having the latest information handy.

Special Advantages of Stock No. 9812 Magic Wave Antenna

The characteristic band-pass action of the Magic Wave Antenna between 500 kc and 23,000 kc, and its ability to isolate coupling between the receiver power supply and antenna, render the system particularly useful in localities where certain unusual interference problems may exist. Types of interference in this category that may be reduced through use of the Magic Wave Antenna are as follows:

(1) **Cross Modulation**—Abnormal r-f signals from local stations may often times be present on the power circuits to which the receiver is attached, and will be introduced by mutual coupling through the antenna capacitance to the receiver input, causing stray modulation effects. Since the Magic Wave Antenna is designed so as to efficiently eliminate capacity coupling between the receiver and transmission line, and between the transmission circuit and the antenna transformer primary, the unwanted signal from the power circuit is eliminated. The ground lead of the antenna coupling transformer must be kept to a minimum length, in severe cases of this interference. The addition of a power circuit filter, with a separate and short return to a good ground will provide additional improvement where needed.

(2) **Long Wave Code**—Coastal communication stations operating at frequencies near to the I-F of the particular receiver involved will be definitely attenuated by the Magic Wave Antenna. The amount of reduction on signals in the i-f range, 450-470 kc amounting to approximately 6 to 1. Where the antenna is used as a means of minimizing this type of interference, the standard 60 foot section supplied, should not be lengthened. Further improvement, in extreme cases, is of course obtainable with standard RCA Wave Traps.

(3) **Image Response**—Signal frequencies above 23,000 kc can not readily cause image response on "C" band where the Magic Wave Antenna is used, due to the high frequency cut-off of the system and resultant attenuation in that range.

(4) **General**—Installations of broadcast receivers on shipboard can be benefited by use of the Magic Wave Antenna, in that cross-modulation and shock excitation effects of the ship's transmitters operating at 500 kc and below, will be suppressed.

Due to an intermediate band-elimination range of the Magic Wave System between approximately 2000 kc and 4000 kc; image and cross modulation interference from stations within this range can, in many cases, be corrected by employing this antenna alone.

Stock No. 11218 Driver Transformer

Replacement units of stock No. 11218 driver transformer have been recently modified in construction, so that the primary d-c resistance now equals 1350 ohms, and the total secondary resistance equals 2000 ohms. These same units also have an extra lead, which is color coded RED-GREEN. This lead has a definite purpose in reversing any electrolysis that may occur in high humidity regions, so that the life of the transformer is prolonged. The extra lead is internally connected to the core of the transformer, and should be connected externally, during installation of the unit, to the GREEN primary lead or to a point of plus "B" potential.

Lack of Sensitivity—Model 85T1

Resistor R-13, which forms part of the divider system supplying residual bias to the first detector and I-F stages, must be of the correct value. In receivers where sensitivity is poor, variation of value of this part should be checked as a likely cause. If measurement apparatus available does not extend to 6.8 megohms, the resistor should be replaced with a standard stock No.

14661 unit. Removing R-13 from the circuit entirely will be permissible where a slight excess of sensitivity can be tolerated.

Phonograph Turntable—Models U-107 and U-109

Replacement turntables Stock No. 14759 have heretofore been shipped less the flexible damper part. This part will be packed with the turntable in the future, and will also be available separately as stock No. 14762.

Replacement Governor—Model 7U2 Motor

Where it is necessary to repair the motor on Model 7U2 due to a faulty governor mechanism, part No. 11703—Governor, may be used for replacement.

Dial Drive Slippage—Model ACR-111

Slipping of the dial drive mechanisms, on any instruments so affected, may be centered either in the friction drive disc assembly or in the idler of the belt system. The recommended methods of repair are:

(1) Install new stock No. 14453 friction drive disc tension spring. The later springs of this type have a fewer number of turns and are of different hardness. Excessive grease on the friction disc will accentuate slippage, hence it should be carefully cleaned with carbon tetrachloride or equivalent.

(2) The idler gear spring should be replaced, using stock No. 14450. This spring has been modified to have 30 turns instead of the original 43. Reduction of the number of turns, as indicated, will of course be satisfactory where replacements are not readily available. The idler should be carefully examined to certify that it is not binding on its bushing.

Trip Pawl Assembly—Models U-107 and U-109

The stock No. 6503 trip pawl assembly is incorrectly specified for the record changing mechanism of Models U-107 and U-109. The correct assembly is stocked as No. 30624.

Clutch Pin on Electric Tuning Motors

The small clutch pin, which is fitted to the end of electric tuning motor shaft, and engages with the gear mechanism may be obtained separately as a replacement by ordering stock No. 30252. Five pins are supplied in each package.

Turntable Plate—10-Inch Type

The turntable plate used on Models 5U, 7U, D 7-7, R-95 and R-93-2 is carried in stock less rotor ring laminations as Stock #13956. This plate is thus available for replacement purposes on assemblies #11737, #11738, #11739, #12048, #12049 and #13084. The importance of exact centering of the rotor laminations in respect to the spindle and stator should not be overlooked in exchanging these turntables.

Model 15K Cabinet—Veneer Lifting

Cabinets of this type, on which the veneer is blistering or lifting away from the solid wood core on the left or right pilasters, should be turned over to a competent local cabinet maker and refinisher for repair. Satisfactory and permanent correction may be effected by the following method:—

(1) Split the blister along the grain of the veneer with a sharp knife so as to form an opening which will allow insertion of glue.
(2) Fill the cavity formed behind the loose veneer with a reliable furniture glue—animal type.
(3) Rub the blistered veneer with a smooth object (head of hammer) until glue has become solidly set.
(4) Sand down the repaired spot—if necessary—and refinish.

CBS Star



Pauline Winslowe appears frequently on CBS programs from the West Coast—and why shouldn't she? She starred on the CBS "Big Town" program, 8:00 to 8:30 P. M. Tuesdays

Receiver 155

Now Sold for Only \$44.50

New Low Price Offers Real Bargain for Amateur Operators

The popular RCA Amateur Receiver ACR-155 can now be obtained from RCA Amateur distributors for only \$44.50! Never before has a receiver with so many valuable features been offered at such a low price, according to E. Braddock, in charge of sales of RCA Amateur receivers.

The following brief summary of the refinements found in the ACR-155 indicates why this instrument made such a hit with amateur operators at its previous price of \$74.50. And it should be remembered that the new price of \$44.50 even includes tubes.

The ACR-155 is superheterodyne with a tuning range of 520 to 22,000 KC. employing nine metal tubes with a stage of r-f amplification for added gain and image suppression—a separate oscillator and separate first detector tube to assure a good frequency conversion factor over the entire tuning range—one stage of i-f amplification with magnetite-core transformer to give selectivity and high gain—diode detection with automatic volume control at will—an audio driver stage ahead of the audio power tube which furnishes 4.5 watts maximum output to the speaker—power supply mounted on chassis.

Operating Convenience

As for operating features: An easy-to-read dial scale system for both the "band set" or main tuning and the "calibration spread." An individually calibrated main tuning scale appears in the dial aperture for each tuning range thereby avoiding confusion in determining to what part of the frequency spectrum one is listening. A 100-1 ratio tuning mechanism attached to the tuning control gives the "hand spread" required for communication service as well as making it easier to tune in all other signals. The tuning control has a large size knob which allows for greater hand movement in making close tuning adjustments—a real asset for extended periods of listening. The crank handle on the knob permits rapid frequency change within the tuning range. Other controls are as follows: sensitivity control, helpful in reducing background noises when tuning between stations and also to prevent "blocking" by strong c.w. telegraph signals; audio volume control; heterodyne or beat oscillator control for c.w. telegraph reception or as an

Extensive Tube Advertising Plans Outlined By D. J. Finn

Broadcasting Featured in 1938 Promotional Program; Dealer Tie-In Material Available

Plenty of sales ammunition and advertising support for RCA Radio Tube dealers is assured by the program already mapped out at tube headquarters, according to D. J. Finn, Radiotron Advertising Manager.

"During 1938 the RCA radio tube promotional program will feature many new and attractive sales plans designed especially to create more interest in the facilities that the radio service dealer has to offer," said D. J. Finn in discussing the advertising and promotional plans for this year.



D. J. Finn

Arrangements have already been made to Radiotron distributors enabling them to make available to their dealers more promotional material on attractive terms. The tried and proven Check-Up idea that sends customers into stores and service shops for the standard ten-point Check-Up will be featured again this year.

Contest First Feature

"The first feature of the new RCA radio tube promotional program is the 'Modernization Contest.' [Details concerning this contest, together with the valuable prizes being offered, can be found in this issue on pages 1 and 8.]

Tie-In with National Advertising

"Spot announcements are being arranged for the Magic Key program, which can be heard on the NBC chain every Sunday afternoon at 2 o'clock. In addition, all RCA Victor ads in The Saturday Evening Post, Colliers, as well as hundreds of newspapers will carry a 'plug' for RCA Radio Tubes.

Material for Dealers

"And there is plenty of material

aid in tuning weak modulated signals; beat oscillator switch; power and standby switch, the latter for use during transmission periods; tuning-range selector; tone control, and jack for attaching headphones. A six-inch loudspeaker is mounted in the cabinet with provision for mounting a second loudspeaker to be attached to monitoring equipment.

The chassis is housed in a metal cabinet of pleasing design which is finished with a crinkled two-tone gray lacquer. The cabinet size is 24 3/8" long x 10 7/8" high x 12 3/8" deep and is fully ventilated. The complete receiver weighs 48 lbs.

Now is the time to see your RCA Amateur Equipment Distributor to get an ACR-155 for your radio station, short wave listening-den, service shop, or wherever receiving equipment having professional appearance and performance at low cost is desired. A postal card addressed to Amateur Radio Section, RCA Manufacturing Co., Inc., Camden, N. J., will bring additional information and the name of your distributor.

for dealers to use in tying in with our new 1938 program. This material is shown in a new sales promotion material catalog, form No. 2934, which dealers may obtain from their local distributors or by writing directly to us.

"Especially I wish to point out the importance of signing up at once for the 1938 RCA Radiotron Window Display Service. Dealers who subscribed for this service in 1937 know just how valuable and effective it is. The 1938 service is equally good and can be obtained this year from your local distributor. Get your order in at once and let this striking window trim go to work for you.

Mat Catalog

"Also available to dealers, free upon request, is a new mat catalog showing proofs of all the ad mats available for dealer use. A wide selection, ranging from one column by two inches to two columns by six inches, is included. Many of the ads feature the ten-point check-up, a never-failing business-getter. These mats are given free to dealers. To obtain the mat catalog, ask for form No. 2759.

Two Other Programs

"Two additional programs available to Radiotron dealers will soon be announced. These programs," says Finn, "are the most sensational ever offered RCA radio tube dealers and will be announced March 1."

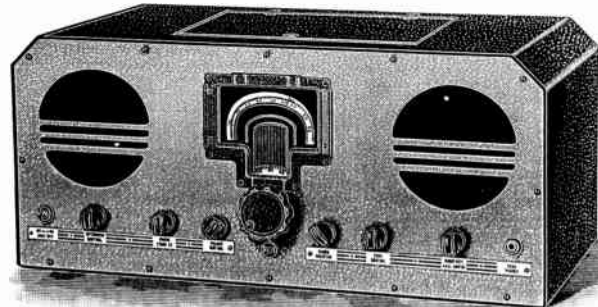
Ten New Tubes Listed By RCA

Ten new RCA radio tubes, many of which are already in service in apparatus now on the market, have been announced to the trade by L. W. Teegarden, RCA radio tube executive. These tubes are intended for use in radio receiving sets and other apparatus designed to use them.

Deliveries on orders for the new tubes are already being made to the wholesale trade. The ten new types are listed and described as follows:

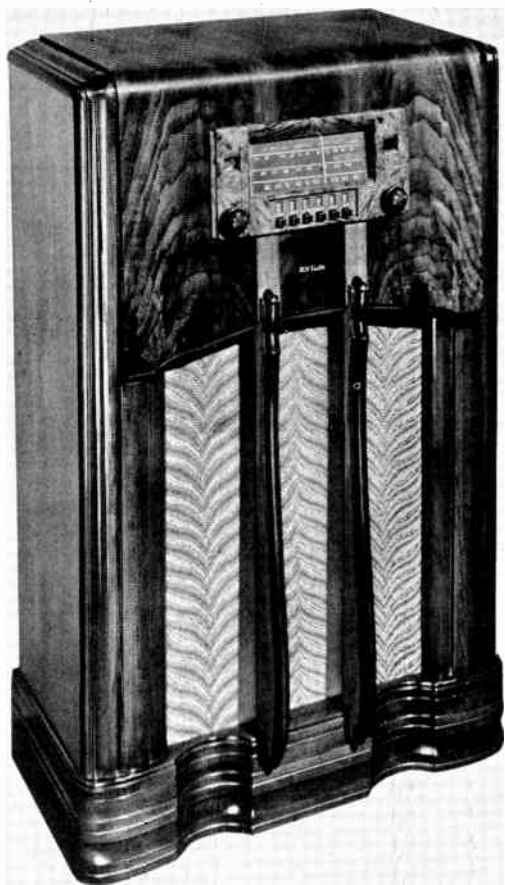
Type	Description	List Price
1G5-G	Power Amplifier Pentode... 2.0-volt filament	\$2.00
6AC5-G	High-Mu Power Amplifier Triode 6.3-volt heater	1.10
6C8-G	Twin Triode Amplifier..... 6.3-volt heater	1.50
6F8-G	Twin Triode Amplifier..... 6.3-volt heater	1.50
6G6-G	Power Amplifier Pentode... 6.3-volt heater	2.25
6U7-G	Triple-Grid Super-Control Amplifier 6.3-volt heater	1.35
6Z7-G	Twin Triode Power Amplifier 6.3-volt heater	1.75
6ZY5-G	Full-Wave High-Vacuum Rectifier 6.3-volt heater	1.50
25A7-G	Pentode — Rectifier 25.0-volt heater	2.25
6V6	Beam Power Amplifier..... 6.3-volt heater	1.75

Ham Bargain



Probably never before has an amateur receiver with so many desirable features as the ACR-155 been offered at so low a price. RCA Amateur distributors now feature this instrument at only \$44.50, with tubes.

Sensational Value



Priced to retail at well under a hundred dollars, this new, seven-tube, RCA Victor Model 87K-2 was acclaimed a sensational value at a recent meeting of RCA Victor distributors. Never before has RCA Victor offered electric tuning at so low a price.

ELECTRIC TUNING IN MODEL 87K-1

By W. P. Maginnis
R. C. A. Victor Engineering Department

The new model 87K-1 and 87K-2 are seven tube superheterodynes incorporating push-button tuning for six pre-selected stations in the broadcast band. In all other respects the receiver is a conventional three band receiver and covers frequency ranges of 540 kc to 1720 kc and 2300 kc to 22,000 kc. The extreme counter-clockwise position of the range switch is the electric tuning position. Since the design of the push-button circuit was the major problem in the design of the receiver, it will be the purpose in this article to outline the problems which arose during the development of these circuits and to describe briefly the solution found for each of them.



W. P. Maginnis

Push-button tuning, as used in this chassis, had to be accomplished without the use of automatic frequency control. It was, therefore, necessary to develop an oscillator having very good stability with respect to line voltage changes and wide variations in temperature and humidity. It was also necessary to provide a simple method for setting the oscillator frequency. The receiver input circuit also was to be tuned by the simplest possible method and had to be reasonably stable to insure good sensitivity and signal-to-noise ratio.

Three Frequency Ranges

The tuning range covered by the push-button circuits is 540 kc to 1550 kc. It is obvious that no simple and cheap method is available which would permit the antenna coil to be tuned continuously through this whole range. The determination of a suitable set of frequency ranges was, therefore, the first step taken in the design of the electrical tuning system.

Investigation of the stable capacity range of mica compression trimmers indicated that a frequency range of 1.8 to 1 could be covered in the antenna circuit with good stability. This gave the following ranges for three sizes of trimmers:

- 1—540 kc to 980 kc
- 2—680 kc to 1220 kc
- 3—860 kc to 1550 kc

Station Frequencies Studied

A considerable amount of data has been accumulated by the Service Division concerning the most important broadcasting stations in the large centers of population in this country. Last year, the Service Division submitted a questionnaire to our distributors and dealers which asked them to list the eight most important stations in their territories in the order of their importance. When the proposed ranges for the push-button receiver, as listed above, were checked against the lists of stations supplied by the

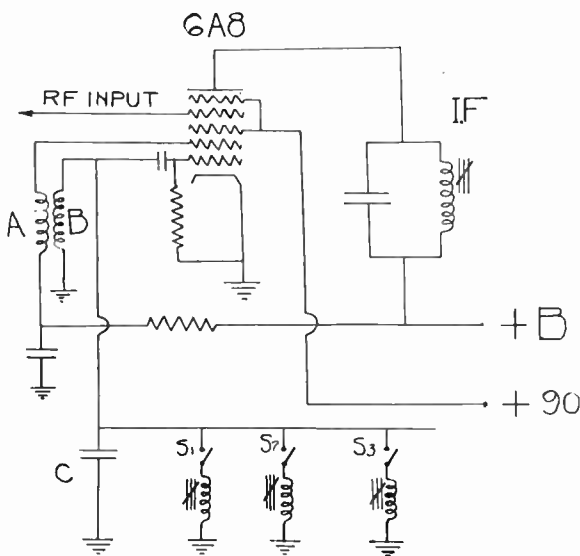


Figure 1

field organization, it was found that they could be expected to satisfy the large majority of listeners in metropolitan areas.

The actual tuning ranges of the antenna circuits, as the receiver is being manufactured, are considerably larger than those listed, but the circuits are most stable when tuned within the ranges noted above. Two stations are available in each of the three tuning ranges. The trimmers are of the dual type with two units mounted on a single ceramic base.

Oscillator Circuit Problems

In the design of the oscillator circuit, several problems arose in connection with frequency stability. The design of a circuit which would be reasonably stable with changes in line voltage was not difficult. No great trouble was experienced

in realizing a frequency shift of less than two hundred cycles per second for line voltage variations of plus or minus twenty volts from the nominal of 115 volts. The circuit used in the receiver is shown in Figure 1. Coil "A" is the oscillator tickler coil for operation on the standard A band or on electric tuning. Coil "B" is closely coupled to "A" and is connected through the push-button switch to the oscillator coils used on electric tuning. S₁, S₂, S₃—are the push-button switches connecting the pre-tuned oscillator coils to the oscillator circuit. The inductance of Coil "B" was made as small as possible without seriously affecting the inductance range of the low frequency push-button oscillator coils. In the final design of the 87K-1, this inductance is about ten times the maximum inductance of the oscillator coil. The capacitor "C" is a temperature compensated unit which will be described later.

It is well known that in a conventional oscillator circuit using the more common materials in the component parts, the oscillator frequency will decrease with an increase in ambient temperature. In the circuit described above, this frequency shift is due to two factors. The first is the increase of dielectric constant of the insulating materials with a rise in temperature. These materials are bakelite which is used in the switches, tube sockets, and coil forms and wax and enamel which are used in the coils. It has been pointed out by J. M. Miller in "Electronics" for November 1937 that these poorer dielectrics have a

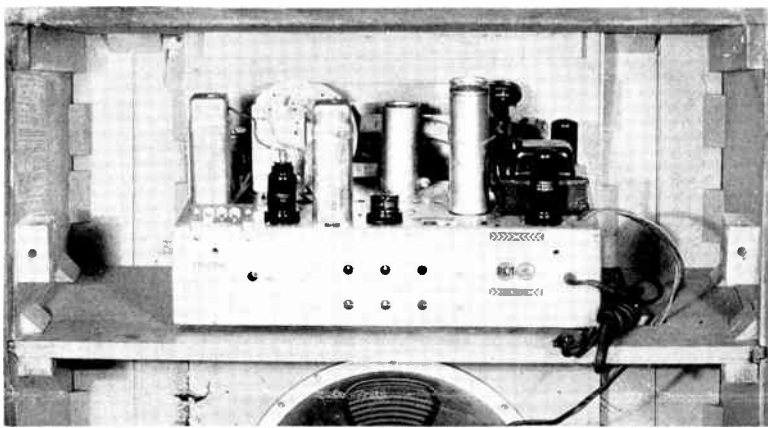
about 140 uuf it was necessary to use a temperature compensated condenser, the capacity of which would be reduced by .9 uuf for a rise in temperature of 30° C. The use of this type of capacitor reduced the thermal drift in the oscillator circuit to less than one kilocycle for a change of 30° C. in ambient temperature. This is considered satisfactory.

This condenser is made by placing two condensers in parallel. One unit has a negative capacity change of two per cent for a thirty degree rise in temperature. The other unit has a positive capacity change of .36 per cent for the same rise in temperature. This is accomplished by use of a different dielectric material in this second condenser. Since the total nominal capacity is 100 uuf the first unit has a capacity of about 55 uuf and the second unit a capacity of about 45 uuf to produce the required loss in capacity. The units have proven to be quite stable and the temperature compensation is very reliable.

Rigid Mountings For Coils

The mechanical design of the oscillator coil assembly provides a rigid mounting for the coils. This is extremely important if stable operation is to be realized. The coil forms are mounted by pressing them on knurled brass bushings which are staked into a rigid base plate.

Three different types of oscillator coils are used in pairs. The nominal frequency ranges of the oscillator coil are considerably larger than those of the antenna circuit



Chassis of Model 87K-1

rather high positive temperature coefficient of dielectric constant.

Magnetite Coils

The second factor influencing the oscillator frequency is the motion within the coil of the magnetite plug due to thermal expansion of the brass stud on which the plug is moulded. This results in a change in coil inductance which, in this design, is in the positive direction.

to take advantage of the full range of the antenna trimmers rather than only the nominal range. The oscillator ranges are listed below. These are signal frequencies tuned by the oscillator and not oscillator frequencies, which are 460 kc higher.

- 1—540 kc to 1160 kc
- 2—600 kc to 1265 kc
- 3—765 kc to 1550 kc

The low frequency end of the broadcast band has been favored in these ranges, a procedure which is justified by the Service Division data previously referred to.

The push-button oscillator coils are solenoids wound on RCA Bakelized Tubing with a 3/64" wall thickness. The coil form is quite

New Window Displays for Tube Dealers

(Continued from Page 1, Column 3)

display, whether a tube window exclusively or a combination of radio and tubes. This display is not seasonal, but can be used throughout the year.

Football Broadcasts Listed

"Then, when fall brings both the biggest radio selling season and football, too, there is the football display unit of the service. For this year we have designed a display which should be of interest to the thousands of prospective customers passing our dealer's locations daily. At the top of the display is a pad of ten separate sheets, each sheet listing the major football games throughout the country, together with the radio stations or network over which they will be broadcast. Simply by tearing off each sheet a complete schedule of ten weeks can be shown. This unit should be in every dealer's window or door at football season.

Special Streamers Again

"Besides the major units of the service, there will be the special window streamers just as in past years. Most dealers are familiar with the World Series score sheet window hangers as an example of special streamers we issue for big sporting events.

"In addition, subscribers to the service will get at least six of the famous radio stars window streamers, and surveys have shown that these pictorial news sheets stop a large percentage of passers-by.

"Thus the 1938 radio tube window display service is just what most dealers need to make their windows produce business. Dealers who want to take advantage of this service should see their distributors at once.

rigid and the dielectric properties are comparable with bakelite. The solenoid winding was chosen because it has a large range of inductance due to the close spacing between the wire and the magnetite plug. Also, it requires a large motion of the plug to tune through the inductance range, a fact which makes it relatively insensitive to small longitudinal movements of the core. The winding is wax impregnated.

Adjustments Accessible

The inductance adjustments for the push-button oscillator coils are readily accessible through numbered holes in the rear apron of the chassis. Antenna trimmer adjustments are made through correspondingly numbered holes in the top of the chassis. The use of the Magic Eye in tuning these circuits to the desired station makes the set up of the push buttons a relatively simple procedure.

METAL TUBES FOR G TYPES

By the RCA Radiotron Engineering Dept.

Metal receiving tubes have now been available for nearly three years. During this period they have progressed from the pioneering stage where their prices were higher than standard glass types to the present stage where prices on many metal types are the same or lower than corresponding glass types and where the new manufacturing technique provides new standards of tube performance.

This progress has been observed by alert radio men who have reported instances where metal tubes did the job better or made a difficult job practical.

Such experiences are always of interest to servicemen in pointing ways in which servicing can be expedited and better performance given to the customer.

Eliminates Birdies

In picknicky receivers, have you tried metal types such as the 6J5, 6J7, 6K7, 6L7, and 6A8 in place of corresponding G types? It is surprising how often the improved shielding of the metal types cleans up those birdies that just won't go away when glass types are used. Metal types have almost ideal shielding which is free from the poor contact difficulties experienced with old glass tube shields and caused by corrosion and warping. Another feature of these metal tubes is their

freedom from bulb effects which may cause static-like noises or reduced gain in high-gain circuits. The metal envelope, because it is a conductor, prevents the accumulation of charges which in a glass type collect on the bulb envelope. It is these charges that cause the trouble either by discharging at audio frequencies or by decreasing the plate resistance.

Likewise, have you tried substituting the 6J5, 6H6, and 6F5 in place of the corresponding G type used in an audio circuit? The metal type being shorter and more compact is less prone to microphonic troubles.

Although differences in performance between metal and G type power tubes may seem unlikely, we have found that the metal types such as 6F6 and 6L6 are less subject to an effect known as bulb rattle. Noise of this nature is caused by the movement of a loose mica insulator against the glass bulb. This effect is not common to metal types partly because of their shorter mounts, but more particularly because the interior diameter of metal shells can be held to very close tolerances.

Have Inherent Advantages

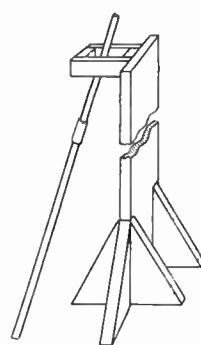
Structurally, as has already been mentioned, metal tubes have certain (Continued on Page 5, Column 5)

Service Tips



Now you can win your choice of a handsome RCA Service Engineer's Pencil or any volume of RCA Victor Service Notes 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.

Antenna Mast Holder



When erecting tall masts or poles of either wood or steel on the level ground or on roofs I find the following device very useful. Take a 2 x 12 and nail an opening made of 2 x 4 approximately six inches square on one end of the 2 x 12. Then anchor the 2 x 12 securely with the square on top. One man may now put the pole or pipe through the hole and raise it with ease. Where pipe is used lengths may be screwed on as the pipe is raised.

E. Moennig
General Radio Service
1203 Eckart St.
Fort Wayne, Ind.

Noisy Ball Bearing Condensers

On some Philco models and others as well that use ball bearings on the vernier drive of the variable condensers, a scratching noise develops after the radio is in use for one year.

Remedy: Wash the ball bearing with denatured alcohol. For a permanent repair, solder a piece of old phosphor-bronze dial cable to the drive shaft (the one the knob is on) and the other end to the chassis.

R. C. Irons
554 Brunswick St.
San Francisco, Calif.

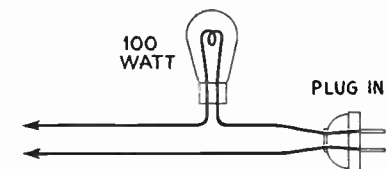
Grunow 11G—Set Dead

Check for screen voltage on 6K7 i-f tubes. Several sets of this model have been found to have a .1 mfd. 200 volt screen bypass condenser shorted. Replacement with a .1 mfd. condenser of 600 volts rating will correct this condition. This condenser will be found connected from the screen of the first i-f tube to ground.

Horace H. Koepke
Junction City, Kans.

Testing AC/DC Radios

We always test all AC/DC radios in series with a 100-watt lamp. This keeps shorted sets from blowing



fuses. After repair, the set is checked in the same way.
Ben Wolf,
372 Tremont St.,
Boston, Mass.

Inlantenna

I recently installed a 67M2 auto radio in a Lafayette 400 car. I had a great deal of trouble in eliminating the ignition noise. After trying everything to eliminate the noise, I got to the fact that it came in through the aerial. In checking up on the aerial, which is the Inlantenna, I found that my helper had put the lead that connects the two aerials together through a hole in the chassis over the end resting on the transmission shaft housing. I disconnected and dropped the connecting lead, and the noise disappeared.

Lucien Lesaffre,
103 Marble Ave.,
Lawrence, Mass.

Running Board Antenna Noise

On Chrysler built cars and some others such as Terraplane and Nash, motor noise is very often objectionable when a running board antenna such as Inlantenna is used. On investigation I found that the antenna itself did not pick up this noise if it was kept as far as possible

to the rear of the running board. However, there is about eight inches of unshielded lead-in connecting on to the antenna proper, and it is this portion of the antenna which is picking up the noise. By slipping shielding on this portion of the lead-in and grounding it on the shield of the lead, this difficulty is overcome. So by taking these two precautions, (1) keep the antenna as far back on the running board as possible, and (2) shield the antenna end of the lead-in, most motor noise cases will be eliminated.

C. K. Allen
1700 7th Ave.
Beaver Falls, Pa.

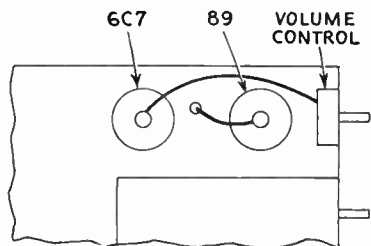
Ford-Philco Model N

To eliminate excessive chassis noise pick-up, remove the small r-f choke, which is located in the power supply compartment, and replace it in series with the line, within the r-f coil compartment.

Norman E. Nelson
Mayville, No. Dak.

Majestic 66 Auto-Set

When working on this set do not replace the grid caps on the 89 output tube and the 6C7 first audio stage in the wrong order. Unless this is guarded against it is the most



natural result since these grid leads must be crossed for proper connection.

Otherwise the 1st A.F. stage will be cut out causing very weak response with everything apparently in good order.

The diagram (top view) shows this arrangement.

Geo. H. Koether, Jr.
Sevrna Park P. O.
Round Bay, Md.

32 Volt Service

We have a rather extensive battery charging service, and have found it a simple matter to operate a 32 volt radio in our repair shops by having a cord running to our charging line.

All that is necessary when we wish to operate a 32 volt radio, is to check the number of batteries on the charging line, and either add to or subtract from the number to get the required voltage.

Frank McQueen
807 Schilling Ave.
Hiawatha, Kansas

Soldering To Alloy Chassis

Here is an idea that has been helping me for years. When soldering to an alloy metal chassis, use a 50-50 mixture of rosin-core solder and Kester aluminum solder. Puddle the two together on the chassis with your soldering iron. You will find that the mixture runs very freely and permits a good, neat-appearing and permanent joint to be made at any point on the chassis.

J. F. Intiso
1730 Fillmore St.
Bronx, N. Y.

RCA R-50

Would not play with type 27 a-v-c tube in the socket, although tube tested normal and replacement with new tubes would still result in no reception. With this tube withdrawn, reception would be normal. When measuring voltages at this socket, found grid to be -15 volts, with respect to ground, and cathode -71 volts with respect to ground. Without tube in socket, plate voltage was 0, but with tube in socket, plate voltage was approximately same as cathode voltage. While

the cathode voltage should have been approximately -20 volts, no explanation was found for this discrepancy. This trouble was cured by substituting a 300,000 ohm resistor for the 40,000 ohm resistor (in the power pack) in series between filament of the 27 a-v-c tube and the filter choke.

George Kinkade
Elk Mills, Maryland

Auto Radio Gadget

It is not always convenient to remove the matched dash plate, dial head, and control cables when removing an auto radio from the car for repairs. The gadget shown below not only saves time but also leaves the instrument panel intact with no gaping holes while the radio is out of the car.

After disconnecting the control cables from the set end and removing the set, use this tool for varying the controls. The tool is made from 1/4" stock with any set screw



type knob. One end of the rod is slotted for 1/2" with a hacksaw; the other end is filed square. The knob may be used at either end depending on the type of fittings of the radio. For radios having slotted internal fittings, a small screw driver is used. Of course this method cannot be used when the volume control is mounted on the dash plate.

Harry Goldstein
AAA Radio Service
1750 University Avenue
Bronx, N. Y.

Noisy Tuning, Bosch 48A and 48AA

Oscillation and noisy tuning in these radios may be caused by a poor ground of the shield on the variometer. Cleaning of rim contacts with sandpaper effects only a temporary cure. A permanent job is done by drilling two small holes through cap and base where they overlap—about 1 1/2" apart—and driving in two self-tapping screws.

Al Lustig
6120 19th Avenue
Brooklyn, N. Y.

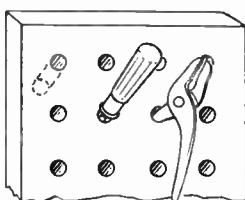
GE K-63, RCA R-73

Set came in with complaint "dead". Check shows no plate voltage on r-f and i-f plates. It was not a filter condenser, as is usually the case, but was due to a shorted plate lead on the last i-f transformer. This lead was of soft rubber covered wire, and had been clamped tightly underneath the i-f shield can, effectively grounding the high voltage to the chassis. The remedy is obvious, although I replaced the damaged plate lead with a length of laquered wire. This short is rather hard to locate, as you must remove the i-f transformer to even see the wire.

Noel L. Havermale
Gem Radio Service
612 So. 20th St.
Quincy, Illinois

Convenient Tool Holder

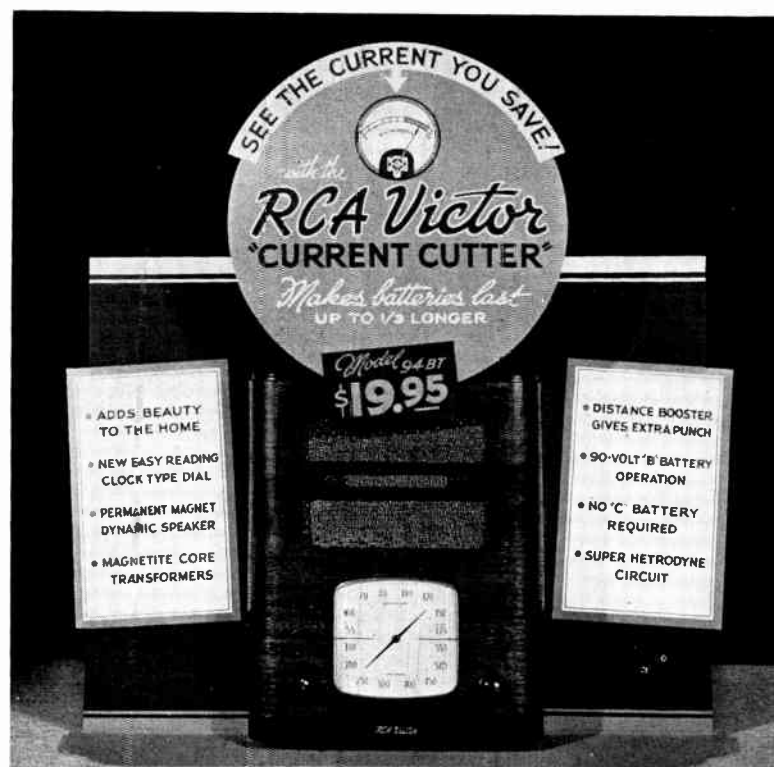
A tool holder such as the one shown below is a great convenience in the shop. It is handier than a long rack or a drawer. Use a 2"



x 12" board about two feet long. Bore 1/2-inch holes downward at an angle. Mount the board at the most-used section of the work bench.

Joseph M. Norman
Memphis, Texas

Metered Display



This novel display does more than tell 'em. It shows 'em—just how much current is saved by the new RCA Victor Farm Radios. A real milliammeter, optional with the display at 60c extra, can be built into the display to measure the current drain when the radio is operating

Big Prizes For Letters About Metal Tube Jobs

(Continued from Page 1, Column 5)

tuition fee of \$140.00.

The Radio Operating course—

regular tuition fee of \$100.

or—The Radio Service course—

regular tuition fee of \$81.

A booklet describing these courses may be had by writing to RCA Institutes, Inc., 75 Varick Street, New York City. This second prize can be substituted by any three pieces of test equipment as listed under the first prize.

The third prize is a choice of any two RCA service instruments listed under the first prize. The value of this prize is approximately \$120.00, depending upon the instruments chosen.

The fourth and fifth prizes are each one of the sensational new No. 153 test oscillators valued \$29.95 each.

\$5.00 for Letters Published

After the first five major prizes, \$5.00 will be paid for each contest letter considered interesting and useful enough for publication in RCA Radio Service News, and that isn't all! Those letters considered acceptable but which are not published in RCA Radio Service News will win one of the unique RCA cigarette lighters—thus every contestant is more than likely to win something and everyone is eligible for one of the major prizes or a \$5.00 reward for a few minutes work.

Contest Rules

The rules of the contest are simple. Here's how to compete for the prizes and at the same time do some profitable business—

1. Go out and sell at least one "G" type to metal changeover job.

2. Write a letter to the RCA Modernization Contest Manager, RCA Manufacturing Company, Inc., Camden, New Jersey, covering two points:

1st, the technical aspects of the job
2nd, the means or methods used to sell it.

The letter should tell how a particular job was sold or what method you have found best in bringing in changeover jobs in general. It might be direct mail campaigns, personal solicitation, newspaper advertising or a window display—tell about it. Then tell the make and model of radio. You can enter the contest right away by obtaining an entry blank from your local Radiotron distributor. In any case, be sure your entry is postmarked not later than midnight, June 15, 1938.

Metal Tubes For G-Types

(Continued from Page 4, Column 5)

inherent advantages as compared with G types. Less known but very important is the fact that the metal construction permits the use of a special gettering method which provides a degree of vacuum hitherto not attainable with receiving tube types. This method, known as the "Batalum" getter method employs a small tantalum coil connected between shell and grounding pin of the tube. By applying current to the coil, the getter contained on the coil can be flashed to just the right amount to obtain optimum results. This method is not practical with tubes of glass construction.

The substitution of metal tubes for G types is an easy job for the serviceman. Questions of realignment of trimmers are everyday matters for the serviceman. He has the knowledge to determine what adjustments are required to give optimum results on a changeover. Some suggestions along this line, however, may prove helpful.

Necessary to Check Grounding-pin

In sets equipped with G types, it is necessary to see that the grounding-pin terminal of the socket is grounded. In some sets, the grounding-pin terminal may be found to have been used as a terminal for some circuit connection not at ground potential. If such is the case, the connection should be anchored by some other method. After making any changes, the set should be checked for alignment.

Metal tubes are useful to the serviceman because they make service problems easier and save time on the job. They require no shielding and they minimize noise and microphonics. Metal tubes are not subject to glass breakage and they withstand great shock. They are small and sturdy and have eye appeal. Service men who keep a stock of metal tubes on hand find them indispensable in service work. They mean less inventory and faster turnover.

Prizes will be awarded and announced in later issues of Service News.

No Fancy Writing

Entries will be judged for selling ingenuity, not for literary merit. You don't have to be a polished writer to win a prize. Just tell in your own words how you sold a changeover job. All decisions will be made by members of the RCA Radiotron and Engineering Depts., and such decisions will be final.

All entries become the property of the RCA Manufacturing Company to be used as they see fit.

\$10.00 IN PRIZES—\$10.00

Win Real Money With Your

SELLING TIPS

Now your best sales producing idea may easily make you an extra profit. For the three Sales Tips which, in the opinion of the Judges, are the best of those submitted and published in the next issue, \$10.00 in prizes will be awarded: first prize, \$5.00; second prize, \$3.00; third prize, \$2.00. All other tips published will win an RCA Service Engineers Pencil as usual.

Sales Tips may be any idea, method, plan, or device that actually produced worthwhile business for you. It might be a method of approach or of getting the order in personal selling, a plan for getting prospects, a direct mail campaign or a window display.

Send your idea to Sales Tips Editor, RCA Radio Service News, Camden, New Jersey. Describe your idea concisely but completely. Tell what was done and the results. Send any samples of material, photographs, diagrams, that might illustrate the idea and be suitable for publication. For instance, in telling about a direct mail campaign, send a sample of the mailing pieces, tell how many were sent and to what kind of mailing list, give the number of replies traced directly to the campaign, and the volume of business resulting.

All Tips submitted become the property of RCA to be used as they see fit. All decisions will be made by the RCA Mfg. Co. and such decisions will be final.

New Dial Plates

When a receiver is brought in on which the cabinet has been marred around the outside of the knobs, by long fingernails etc., you will find that people are quite willing to make the extra investment to have small etched metal dial name plates put on to cover up the marred surface. Not only is it easy to sell them, but their friends will bring their receivers in for the 10-point check-up specifying that you put them on.

Frank Fruehauf
De Hayes Fruehauf Lab.
5109 Audubon Avenue
Detroit, Michigan

Sells Tubes and Service

In my store I have a variety of used radios that use almost all the popular types of tubes. When a customer brings a tube in to be tested, I let him listen to a radio employing that type, then remove the tube known to be good and substitute the customer's tube. If the tube is defective, the customer is convinced and readily buys a new one. If the tube is OK, the customer realizes that his radio should be checked—and it is then much easier to get your price.

Mrs. Joseph Cherry
496 Central Avenue
Brooklyn, N. Y.

NBC Vocalist



As pleasing to the eye as she is to the ear is lovely Yvonne King, a songstress who is well liked by radio listeners who tune in the NBC-Blue network at 9 P. M. Tuesdays

Franchise Plan Adopted for Sound Dealers

(Continued from Page 1, Column 4)

chandise, such as the inexpensive remote mixing unit and the spectacular new 100-watt speaker, will give our Authorized Dealers valuable opportunities to develop a real business. Special selling plans, unlike anything heretofore available in the industry, have also been prepared.

"Obviously the RCA Commercial Sound franchise will be much sought after. Dealers who are interested should consult with their nearest RCA Commercial Sound distributor or write direct to RCA Commercial Sound Section, Camden, N. J."

New Oscillator, A-C Operated, Lists At \$29.95

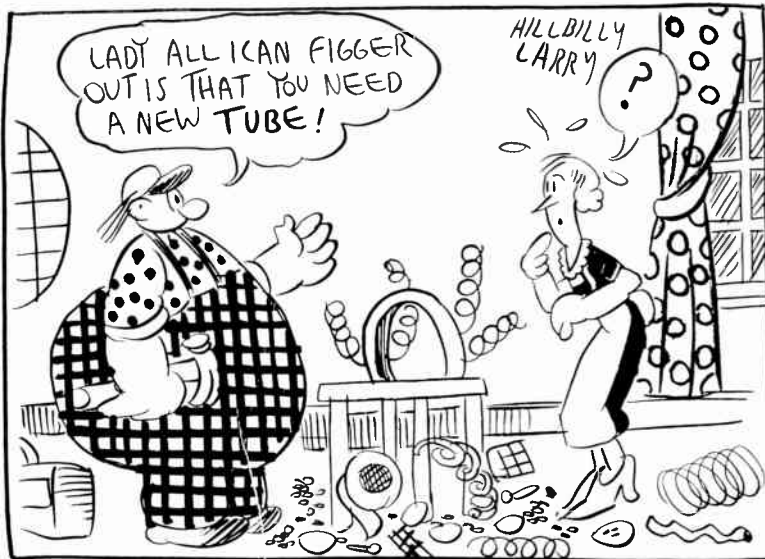
(Continued from Page 1, Column 1)

control of output from zero to 0.25 volts.

4. Internal Modulation of 30% at approximately 400 cycles. Jack provided for external amplitude modulation. Modulation characteristics essentially flat up to 8000 cycles.
5. External Freq. Mod. Jack provided for use with sweep condenser for visual IF alignment.
6. 400 cycle output of 8 volts available for audio circuit testing.
7. All metal tubes.

Electrical Specifications

Power Supply Rating
Voltage 110-120 volts
Frequency 50-60 cycles



Courtesy Larry Smith, Box 65, Dallas, Texas

Power Consumption.....30 watt
Fuse Protection.....½ ampere
Range & Application
R. F. Frequency,
100 KC-30,000 KC
No. of Bands.....6
Audio Modulation Freq.
Approx. 400 cycles
R. F. Output
Low.....0.02 volt max.
Med.....0.25 volt max.
High.....1.0 volt max.
Minimum Signal.....2 Microvolts
Leakage.....Negligible
Output Impedance
Low.....10 ohms
Med.....750 ohms
High.....4000 ohms
Tube Complement
RCA-5W4.....Rectifier
RCA 6C5.....Audio Oscillator
RCA 6J7.....RF Oscillator
Dial Scale
Full vision Airplane Type 6½ in.
dia. over 50 inches scale calibration.
Calibration accuracy.....2%
Dimensions
13¾" x 9¼" x 6½" deep.
Finish
Blue-Gray wrinkle.
Weight
12½ lbs.

New Available

Shipments of this remarkable new service instrument have been made to RCA Parts distributors, who are glad to demonstrate it.

Record Breaker



Col. Alexander P. de Seversky is shown seated in the RCA-equipped Seversky plane in which he recently established a new New York-Havana record. Of American airports and airplanes, a majority use RCA radio equipment

Ordering Tip

When ordering RCA Radiotron Sales Promotional material, always place your order through RCA Radiotron distributor. This is the tip of L. W. Teegarden, RCA Radiotron Sales Manager.

"Many of our distributors order some items in quantity, thereby saving transportation costs and enabling them to give fast service. Also, we have made arrangements whereby distributors can offer material on attractive terms, although the regular price prevails when ordered direct from the factory by retailers. My tip is: Order through your distributor."

Aviation Radio Guide Book Is Issued By RCA

Gives Compass Bearings And
Other Data For Aerial
Navigation

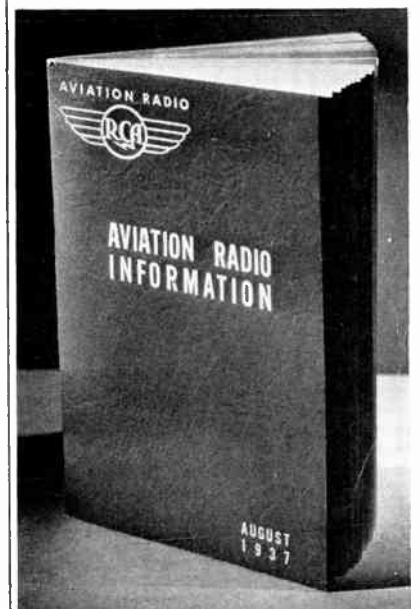
A handy little book, containing a mine of valuable aerial navigation information, has been made available to professional and sportsmen pilots by the Aviation Radio Section of the RCA Manufacturing Company.

Its 132 pages are full of useful information and data for planning flights, and for "blind" instrument flying. Compiled after nearly a year of effort and with the wholehearted cooperation of more than 600 radio broadcasting stations, the book has data on aircraft radio, radio-compass flying, obtaining true bearings of broadcast stations from nearest airports, distances from airports, obstruction lighting, height of towers, radio call letters and the frequencies of transmitting stations. The stations are listed alphabetically by state and city.

More than a dozen pages are devoted to an up-to-the-minute kilocycle index of United States broadcasting stations listed by frequencies.

While intended primarily for aviators, the new aviation radio book will also be of interest to many others in the radio and aviation fields. A limited number of copies are available at 25 cents each from the Aviation Radio Section of the RCA Manufacturing Company, at Camden, New Jersey.

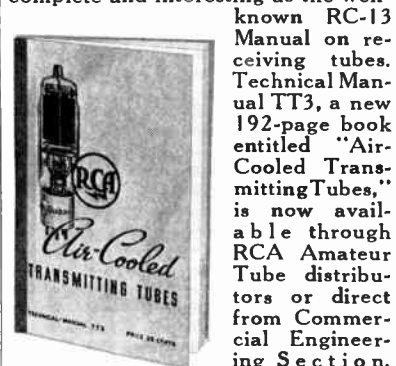
Bearings



This guide book gives the compass bearings of all American broadcasting stations from the nearest airport, and a wealth of other information helpful to aerial navigators and airport officials

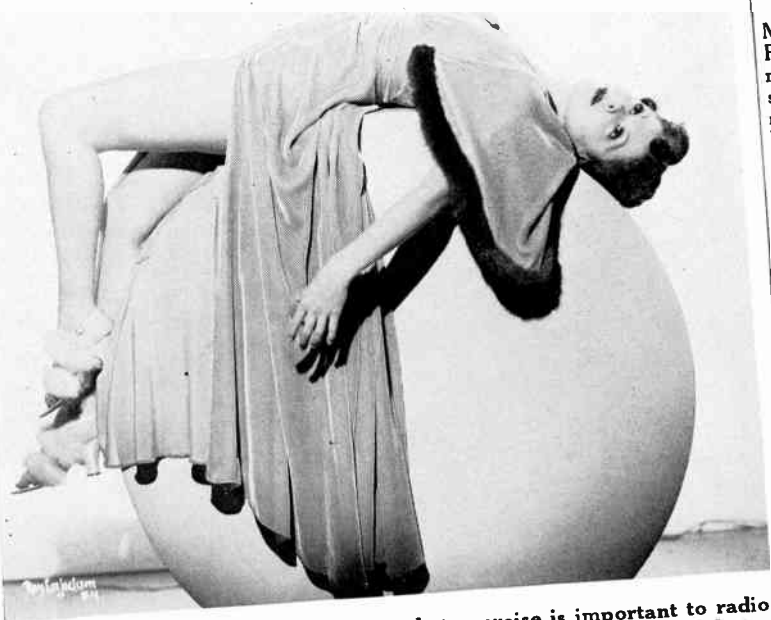
Transmitting Tube Manual

Now amateurs and others have a treatise on transmitting tubes as complete and interesting as the well-known RC-13



Manual on receiving tubes. Technical Manual TT3, a new 192-page book entitled "Air-Cooled Transmitting Tubes," is now available through RCA Amateur Tube distributors or direct from Commercial Engineering Section, RCA Mfg. Co., Inc., Harrison, N. J., at 25¢ a copy. The book gives complete technical data on all RCA air-cooled transmitting tubes, plus a wealth of general tube information. Characteristics, maximum ratings for various uses, and socket connections are given for each tube, with charts and an illustration of the tube. In addition, more than 80 pages are devoted to discussion of tube design, materials, circuits, formulas.

Poise



Lora Marlo, NBC dramatic star, says that exercise is important to radio actors. It develops poise, says she, and this view of the beautiful star shows that she has the poise

Service Meetings Draw Big Crowds

The recent RCA Victor Service Meeting Series, "Modern Sound By RCA," has been presented in 60 major cities to date with several smaller cities planning for later meetings. Although it was naturally expected that a meeting covering technical data on Commercial Sound Systems would draw perhaps somewhat less than a general radio service series, results showed this belief to be incorrect. Over 6000 men have attended the meetings to date—an average of 100 per meeting. The only conclusion to be drawn of course is that the interest of servicemen in commercial sound equipment is increasing rapidly in keeping with general expansion in this field.

Servicemen turned out in usual excellent fashion in such metropolitan centers as New York, Philadelphia, Pittsburgh, St. Louis, Los Angeles, etc. Record attendances were registered in San Francisco, San Antonio, Des Moines, and Houston.

In several cities where the complete line of RCA Victor Commercial Sound Equipment was on display, outdoor demonstrations using the new 100 watt permanent magnet speaker were made. Perfect clarity resulted over half mile distances.

Although the major portions of audiences were composed of servicemen, checks disclosed School Principals, Factory Executives, baseball people, etc., were very much interested from the consumer angle.

an amplifier, thus lowering the input requirements of the external modulating source, de-coupling the external source from the r-f oscillator and offering a constant impedance to this external source.

Oscillator 153 Has Valuable New Features Higher Output and Lower Leakage Distinguish New Instrument

By O. M. OWSLEY

The Stock No. 153 oscillator has been designed to fill the need in the service field for a high quality, medium priced, oscillator completely a-c operated and retaining all the features found in our previous d-c operated Model 97-C (Stock No. 9595). This model, in addition to retaining previous features, will offer several additional ones. These are:

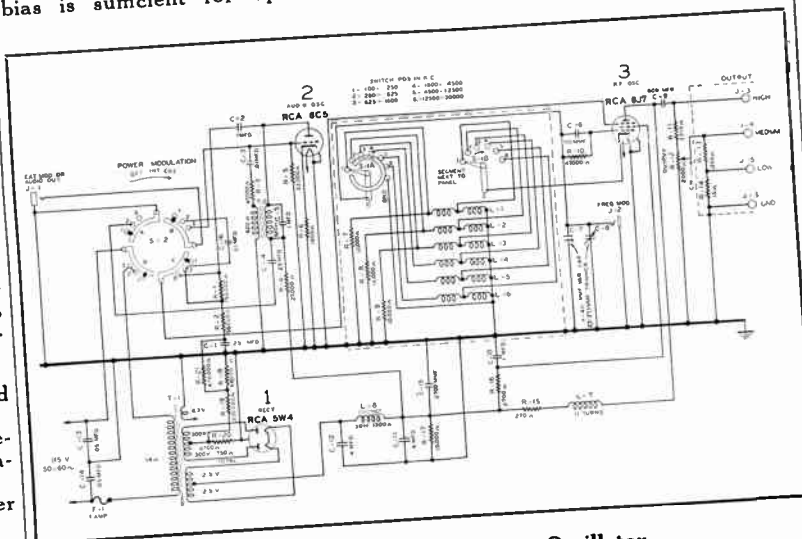
1. Higher Maximum Output
2. Lower Minimum Signal and Lower Leakage
3. Less Audio Power Requirements for External Modulation
4. Improved Dial Scale—better readability
5. Improved Calibration
6. Audio at 400 cycles available on front panel
7. Improved Attenuation—Lower Output Impedance

General Description

The instrument supplies an r-f signal of approximately 1.0 volt maximum over the frequency range of 100 kc to 30,000 kc which is divided into six (6) ranges. This signal may be modulated by the associated audio oscillator approximately 30% at 400 cycles, modulated by an external source at any

below. A 6J7 electron coupled oscillator employing a Hartley circuit is used for the r-f oscillator. This simplifies the coil system by obviating the use of coupling coils and allowing the tank inductance to be a continuous winding with a tap for the cathode. Compensation is used in the work plate circuit in order to have constant r-f output on all frequencies.

Suppressor modulation is employed on the r-f oscillator. The suppressor is maintained at -16.5 volt bias supplied from the negative side of the power supply. This bias is sufficient for up to 75%

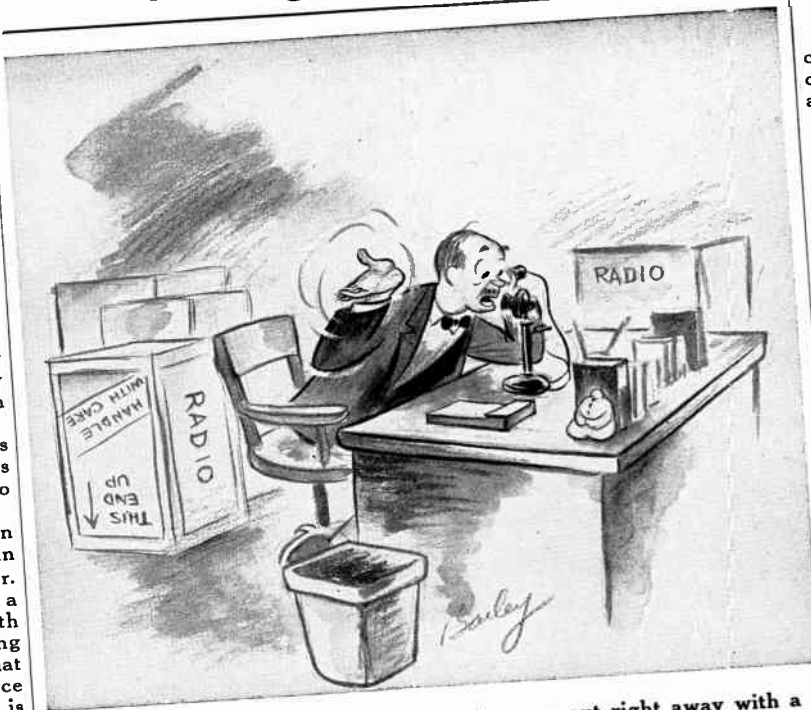


Schematic Diagram of No. 153 Oscillator

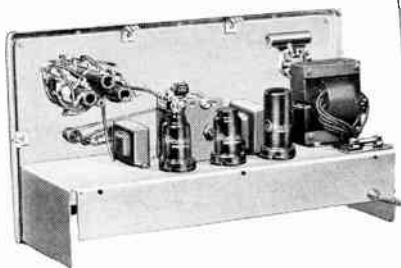
modulation. The audio oscillator employs a 6C5 in a tuned plate circuit. Cathode degeneration is used to decrease the coupling and to improve the audio wave shape. When using external modulation, the audio oscillator tube is converted to

A new method of grounding the chassis to the case along the back edge gives improved performance as regards leakage and allows the elimination of the conventional screws around the edge of the front panel, thus improving the appearance of the instrument.

Mr. Egglemud's Boss



"Mice in your radio! I'll send a service man out right away with a wave trap, Mrs. Doaks."



Chassis of No. 153

desired frequency, or frequency modulated for visual alignment by a Frequency Modulator Unit such as the RCA Stock No. 9558.

Three output attenuator taps plus a fine control gives continuous control of output voltage from zero to 0.25 volts.

The instrument is housed in an attractive steel cabinet finished in a fine blue-gray wrinkle lacquer. The front panel is finished in a neutral gray background with nickel trimming. The carrying handle is of the improved snap flat type which adds to the appearance of the unit. Approximate size is 12 3/4 x 9 1/4 x 6 1/2 in.; weight, complete 12 1/2 lbs.

The schematic diagram is shown

Televizing Big Apple



The scope of television entertainment is shown by the scene above in which Terry and Fran Carroll do The Big Apple in "When They Play The Waltz," dramatic production adapted for television by John Gihon, NBC television script writer, and presented from NBC's New York studios. Note the absence of grotesque make-up in NBC television productions

Television Parts Announced To Experimenters

(Continued from Page 1, Column 2)

grams for each parts may be had on request to any RCA Parts distributor. Ask for Television Parts Folder, Form No. 2853. Following is a brief description of the parts shown in the folder:

Deflecting Yoke

For RCA 1800 and 1801 Kinescopes. Has windings for both horizontal and vertical deflecting circuits. Designed to have uniform flux distribution. Size: Outside di-



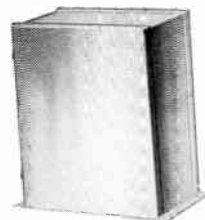
ameter 2 1/2 inches; Inside diameter to fit RCA 1800 and 1801 Kinescopes; Length 3 3/4 inches. Stock No. 9831. Net price \$10.00.

Power Transformer

For RCA 1800 Kinescope. Includes all windings necessary for a complete power supply for the anode and heater circuit of the 1800 Kinescope. Plate winding of 4,500 Volts and two 2.5 volt heater windings. Entire transformer insulated for high voltage. Size: H. 6 1/8", W. 5 1/8", D. 3 3/8". Stock No. 9832. Net Price \$12.50.

Power Transformer

For RCA 1801 Kinescope. Includes all windings necessary for complete power supply for the anode and heater circuit of the



1801 Kinescope. Plate winding of 2,300 volts and two 2.5 volt heater windings, adequately insulated. Size: H. 6 1/8", W. 5 1/8", D. 3 3/8". Stock No. 9839. Net Price \$10.00.

Vertical Output Reactor

A high-quality auto-transformer for matching the output of deflecting circuits to the deflecting yoke vertical circuit. 120 henries inductance, 3800 ohms d-c resistance. Size: H. 2 3/4", Base 2 1/4" square, Diameter 2 1/8". Stock No. 9833. Net Price \$3.00.

Vertical Oscillation Transformer

A scientifically designed transformer for low-frequency blocking-oscillator circuit. Gives best efficiency at 60 cycles. Size: H. 2 3/4", Base 2 1/4" square, Diameter 2 1/8". Stock No. 9834. Net Price \$3.00.

Horizontal Oscillation Transformer

This transformer is designed for high frequency blocking oscillator circuits. It has high efficiency at



frequency of 13,200 cycles. Size: H. 2 3/4", Base 2 1/4" square, Diameter 2 1/8". Stock No. 9835. Net Price \$3.00.

Horizontal Output Transformer

Has correct characteristics to supply a 13,200-cycle saw-tooth current wave to deflecting yoke. Core and coil rubber mounted to eliminate noise. Size: H. 3 1/4", Base 2 1/8" square, Diameter 2 3/8". Stock No. 9836. Net Price \$9.50.

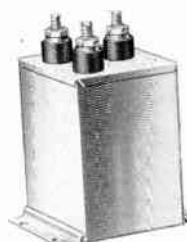
Power Supply Capacitor

For RCA 1800 Kinescope. A high quality 6,000 volt unit containing two .03 mfd. capacitors. High-voltage terminals provided for one center and two outside connections. Oil-filled construction to insure long life. Size: H. 6 1/2", W. 2", D. 2 3/8". Base 3" x 2 3/8". Stock No. 9837. Net Price \$11.75.



Power Supply Capacitor

For RCA 1801 Kinescope. A high quality capacitor containing one 0.25 mfd. 4,000 volt unit and one .05 mfd. 3,500 volt unit. Oil-filled construction with high-voltage terminals. Size: H. 3 1/8", W. 2 3/8", D. 2 1/8", Base 3" x 2 3/8". Stock No. 9840. Net Price \$5.50.



Power Supply Reactor

A newly designed high inductance reactor for Kinescope filter circuits. Insures good regulation in power supply circuit when used in conjunction with Stock Nos. 9837 or 9840 Power Supply Capacitor. Size: H. 4", Base 3 1/4" square, Diameter 3 1/8". Stock No. 9838. Net Price \$4.75.

Executives of Tube & Parts Dept. Named

News of interest to the radio trade was contained in the recent announcement by George K. Throckmorton, President of RCA Manufacturing Company, that Eugene N. Deacon, formerly manager of the RCA Radio Tube and Parts Division, has been assigned new duties in connection with market research and analysis.

The six departments of the RCA Radio Tube & Parts Division will be under the direct supervision of Vance Woodcox, Vice-President in charge of Package Goods Sales. The departmental managers are as follows:

J. T. Bray, Export Sales
Meade Brunet, Equipment Tube Sales
J. A. Milling, Radio Parts Sales
D. Y. Smith, Power Tube Sales
L. W. Teegarden, Renewal Tube Sales
L. S. Thees, Tube Parts & Machinery.

REMOTE ELECTRIC MIXING WITH SOUND AMPLIFICATION SYSTEMS

By W. L. ROTHENBERGER
Manager, RCA Commercial Sound Department



W. L. Rothenberger

Ever since sound amplification systems came into widespread use there has been a need for an inexpensive yet efficient means of "mixing" the output of two or more microphones so that their combined output through the amplifying system would produce the effect desired.

Mixers are used to provide a musical background for speech, to fade from speech to music, to achieve the proper balance of sound from an orchestra, and in many other situations where it is necessary to combine the pickup of several microphones. Devices for this purpose have been available for years, but they were elaborate, expensive and entailed great complica-

tions in the wiring systems.

It was not until 1937 that a simple and inexpensive mixer became available when RCA introduced a mixer that was low enough in price to be a part of the sound systems in general use, that did not require trained operators, and that was highly efficient. This development offers great opportunities to all who are commercially interested in sound systems. They can now offer their customers a far more versatile and useful sound equipment that will produce the results their customers want but which heretofore they have been unable to afford.

Not Electronic System

The RCA Commercial Sound Mixer is not an electronic mixing system but is an electric volume control system which overcomes all the obstacles previously encountered in electronic mixing systems and in low or high level input mixing systems. It makes it possible to control volume very conveniently with-

Mobile Television Outfit



Typical of RCA's leadership in the development of television is this television transmitter caravan which will be used in New York in 1938. Note the iconoscope camera and antenna on the roofs of the cars. This equipment will transmit by ultra-short wave to the Empire State Building atop which is the main transmitter used in RCA's television broadcasts

MODERNIZATION CONTEST

NOTHING TO BUY! NO LABELS TO SAVE! NO PUZZLE TO WORK!



IT'S EASY
TO WIN!

RULES OF CONTEST

1. Go out and sell at least one G-type to metal-tube modernization job.
2. Write a letter to Modernization Contest Manager, RCA Manufacturing Company, Inc., Camden, N. J. In your letter tell how you sold the particular job or what methods you find best for bringing in modernization jobs in general. It might be a direct mail campaign, personal solicitation, window display, etc. Give the details briefly. Tell what you did and how much business it produced.
3. Get your letter in to the Contest Manager not later than June 15, 1938. Prize winners will be announced in the July issue of RCA Radio Service News.
4. All entries become the property of RCA to be used as they see fit. All decisions will be made by the RCA Manufacturing Company and such decisions will be final.

FIRST PRIZE is this wonderful assortment of scientific RCA Test Instruments, or your choice of any other five RCA Test Instruments shown in Catalog (except 9" Oscillograph), plus the small bench tools shown in picture. Value, if instruments shown are chosen. **\$254**

SECOND PRIZE is your choice of any Home Study Course offered by RCA Institutes, the nation's oldest radio school. Value, if Radio and Sound Course is chosen. **\$140**

THIRD PRIZE is your choice of any two RCA Test Instruments (except 9" Oscillograph). You might choose the No. 9545 Oscillograph (3" screen) \$63.95, and the No. 9633 Beat Frequency Oscillator \$64.50, making the total value of this prize over. **\$128**



FOURTH and FIFTH PRIZES are each one of the remarkable new RCA Test Oscillators No. 153, shown. Value **\$29.95**

\$5.00 CASH AWARDS

will be made for every entry considered interesting and useful enough for publication in RCA Radio Service News.

PLUS one of these unique RCA Radiotron Cigarette Lighters for other entries considered acceptable and of merit by the judges. Your entry does not have to be published for you to win a prize!



TUBE DATA

Nine popular types of all metal tubes are replacements for corresponding "G" types so far as general characteristics and bases are concerned. To obtain the improved performance from the better shielding and sturdier construction of the metal tube, all that is necessary is to slip the metal tube into the socket. In radio frequency sections of the receiver it may be necessary to make minor adjustments.

These interchangeable types are as follows:

6A8G-6A8	6J5G-6J5
6L6G-6L6	6F5G-6F5
6L7G-6L7	6H6G-6H6
6F6G-6F6	6J7G-6J7
	6K7G-6K7

Equivalent values in any RCA merchandise may be substituted for the first five prizes

out distortion.

In developing this system, many years of research and development were made not only on circuits but also on tubes and control parts. Special tubes had to be developed, special pads designed and special circuits developed. The system had to be one which would give a smooth control of the volume without any noise or "plops" at any point of the potentiometer. As finally released to the public, the system did not have the customary volume control in the audio circuit. It was thus unnecessary to have preamplifiers ahead of the mixer system, but all the benefits of a high level mixer were retained.

The change in volume is obtained by varying the voltages on the bias of the input tube. This arrangement insures operation along the straight portion of the dynamic characteristic of the tube for all settings of the gain control and thus effects a smooth control of the gain. Also, no distortion is encountered when using this method since the signal always operates into the tube with a linear grid voltage plate characteristic. Another advantage from this type of system is its extremely low insertion loss.

Simple Wiring

The new RCA electric mixing controls have been used a thousand feet from the amplifier with unchanged characteristics. On these tests #18 unshielded cable was used. Thus you can see that the wiring necessary for this type of a system is very simple. The cable, being of a standard type, it can be easily obtained. Installation is easily made. As the voltage is low, Underwriters are not particularly interested in these low voltage circuits and a great number of circuits can be run in one conduit. It has also been found that it is not necessary to use shielded cable on these runs as it is only a voltage change which is made.

Each mixer pad requires three wires in order to function properly. It is recommended that #18 wire be used due to the fact that this wire is practically universally obtainable and the drop in voltage would be very small. Wherever two or more control pads are used, one wire can be made common for the ground return thus eliminating one wire for each additional volume control. For instance, a two pad control unit will require only five wires and a four pad control unit will require only nine wires.

Compact Unit

Due to the compactness of the remote mixers, a great deal of flexibility can be had. The unit can be attached to the orchestra conductor's stand, or to a microphone stand as desired. The attractive housings are of chromium plate so that they match microphone stands and instrument equipment of the modern trend. A portable cord can be run from the unit to the amplifiers.

Where an installation is to be made permanent, more than one remote mixing outlet can be provided. For instance, in locations such as football fields, baseball fields, hockey rinks or auditoriums, mixer outlets can be paralleled to different locations. As the scene of activity

varies, the mixer and microphones can be moved to these areas and announcements and control of volume had from those points. There is also another advantage. Extra input stages can be added to the system and emergency announcements can be made from the box-office or from the director's office or any other location where a remote mixer station is wired in or an outlet is provided together with a microphone outlet.

Useful In Schools

For school installations, this system will find many applications. An input stage can be wired together with its control to the gymnasium, music room or auditorium and a portable mixer together with a microphone can be taken to these locations and the system operated from these points. It is also possible to give the same flexibility to the Superintendent or Principal and he can control the volume and make announcements from his location.

In night clubs there will be a great demand for this type of installation, due to the fact that the master of ceremonies can control the volume from his location, or it can be controlled by the head waiter from a remote location in the night club. When the master of ceremonies or his troupe is through with the microphone, the volume can be cut down, making it possible to pick up any floor noises or any conversation between him and his troupe.

For Orchestra Leaders

The flexibility desired by orchestra leaders can be had in that different microphones can be placed throughout the orchestra. The soloist can step to the nearest microphone and the leader can raise the volume on that particular microphone so that the soloist will be heard above the other instruments, or, if a singer, her voice will be heard above the sounds emanating from the orchestra. He can also fade one in and fade the other out as he desires to have certain passages brought out by different instruments.

Valuable



The attractive decalcomania shown above is the symbol of a valuable franchise for which applications are now being received under the new RCA Authorized Commercial Sound Dealer Plan