



# RADIO SERVICE NEWS

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## TUNE-UP HELPS SELL SERVICE FOR ENGINEERS

### National Advertising And Local Tie-ins To Push Campaign To Public

Now all radio service engineers may participate in a tried and proven Radio Service Tune-Up Campaign that will be promoted nationally by the RCA Radiotron Division through magazine, newspaper and radio advertising during the months of October, November and December. The campaign consists essentially of an offer to owners of radio sets to have a specified amount of work done for the special price of \$1.50. The campaign features service exclusively and is based on the fact that in the vast majority of cases, customers accepting the offer may be sold new tubes, parts, services or, in some cases, new sets. It is designed exclusively for the service engineer, or the service department of radio dealers.

#### Business Builder

"More profitable business and increased sales of service, parts and tubes are the benefits to the service engineers participating in the RCA Tune-Up Campaign," according to E. N. Deacon, Sales Manager of the RCA Radiotron Division. "This campaign has but one objective," said Mr. Deacon, "and that is to increase the business of all service engineers. It is a straight business-building proposition, with a minimum of RCA advertising, and is designed to place the service engineer on a more profitable basis. RCA's return is the increased sale of parts and tubes that is the natural result of increased activities of service engineers."

#### Four Point Campaign

The campaign will be promoted through the medium of four different forms of advertising, all of which are proven in their ability to produce results. They are:

## Easy Payment Plan For RCA Service Tools

### Easy Payment Plans Enable Trade to Obtain Complete Equipment at One Time

The very latest type of servicing equipment has been brought within the reach of additional thousands of service engineers by the attractive, easy-payment terms offered by a number of RCA Parts distributors, according to G. P. Allen, Assistant Sales Manager of the RCA Parts Division. This plan enables service engineers to obtain, for instance, not only an RCA Oscilloscope, but also the necessary complementary equipment (Test Oscillator and Frequency Modulator) at

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## Night Club Queen of the Air



Eunice Howard, dramatic star of the Life Savers' Rendezvous program, which is heard over an NBC-WJZ network Wednesdays at 8 p.m., E.S.T., is shown above. Phil Duey, leading man of the show, says she's the liveliest girl he's ever met. All of which ought to make for high good times on the new show, which has a night club setting.

ent forms of advertising, all of which are proven in their ability to produce results. They are:

1. A national advertising campaign in magazines with two full-page ads, the first in the October 26th and the second, November 16th issues of the Saturday Evening Post. These ads are to be followed with a series of half-page ads later.

2. A retail newspaper advertising campaign of 4 column, 10" ads in 39 principal trading centers, these ads to include the names, addresses and phone numbers of all service engineers participating in that area. Three series of ads will be used, one for each month of the campaign.

3. A direct mail campaign con-

(Continued on page 6, column 1)

## KOBAK OF NBC TO SPEAK AT N.Y. I.R.S.M. CONVENTION

### Annual Meeting Of Institute Of Radio Service Men To Be Held October 25, 26 and 27

Friday, October 25, will be the "big night" at the Institute of Radio Service Men Regional Convention at the Hotel Pennsylvania, New York City, according to F. L. Horman, Chairman of the Second Region, I.R.S.M. The Convention will be held on October 25, 26 and 27, but RCA night, which is Friday, October 25, will offer an outstanding program. A rare treat for service engineers will be the stellar speaker, Edgar Kobak, vice-president in charge of sales of The National Broadcasting Company, who is widely known for his fascinating talks on radio subjects.

Other speakers that evening will include M. M. Brisbin of the RCA Service Division, who will deliver a talk on the new RCA Metal Tubes, their design, manufacture and service applications. This talk on metal tubes will be the first to go into their basic design and manufacture. It thoroughly covers every phase of these modern tubes from their inception to the receiver circuit refinements made possible by their use. One of the features of this talk will be a series of slides which shows a trip through the great RCA manufacturing plant at Harrison, N. J.

#### Oscilloscope Displays

A display of the latest RCA test equipment will be operating to show service engineers the simplicity and ease with which instruments such as the Cathode Ray Oscilloscope may be applied to service problems. Factory engineers will be on hand to explain the application of this equipment in regard to individual problems. Service engineers in N. Y. should be on hand for the meeting.

#### Ethiopian Broadcast

An unusual feature of the RCA Program on Sunday, October 13, over NBC-WJZ coast-to-coast network, was the rebroadcast direct from Addis Ababa of Ed Beatty, U.P. correspondent, with direct information on the war situation. The same program also included Jimmie Gleason and Helen Broderick.

## RCA MAGIC KEY PROGRAM TO BE HEARD SUNDAY

### Broadcasts to Include Stage And Screen Stars With Technical Features

The Magic Key Program of the Radio Corporation of America, which is being broadcast over the coast-to-coast NBC Blue network on Sundays from 2 to 3 P. M., Eastern Standard Time, will feature the most famous artists of the opera and concert hall, the stage and screen, and of radio itself. This series of programs will demonstrate the infinite variety of entertainment which radio and Victor Records provide for the people of America.

#### Available to World

The full hour broadcast will be an "RCA Family" program. The talent to be presented will include broadcast stars from NBC, recording artists of RCA Victor and screen stars known to the public through

(Continued on page 4, column 1)

## Two Channels



Many installations of the RCA Victor School Sound System throughout the country are helping faculties improve their teaching methods. The beautiful Control Cabinet, shown above, has two Magic Brain receivers and an automatic phonograph.

## THE WORLD PROGRESSES AND HISTORY REPEATS

About 60 years ago there appeared in a Boston newspaper an editorial which read something like this:

"A man about 46 years of age, who gives his name as Joshua Coppersmith, has been arrested in New York for attempting to extort funds from ignorant and superstitious people by exhibiting a device which he claims will convey the human voice over wires so that it will be heard by the listener at the other end. He calls the instrument a 'telephone', which is obviously intended to imitate the word 'telegraph,' to win the confidence of those who know of the success of the latter instrument without understanding the principles on which it is based."

"Well-informed people know that it is impossible to transmit the human voice over wires [wires, mind you] as may be done with dots and dashes of the Morse code, and that, even were it possible to do so, the thing would be of no practical value. The authorities who apprehended this criminal are to be congratulated and it is hoped that his punishment will be prompt and fitting, and that it may serve as an example to other conscienceless schemers who enrich themselves at the expense of their fellow men."\*

\* Reprinted from "Radio and Its Future" by Martin Codel.



## Built To Precision Standards



The new de luxe RCA AR-60 Communications Receiver includes such highly desirable features as continuous electrical band spread, crystal i-f filter and regulated voltage supply. See your RCA Amateur Distributor for details of this remarkable receiver.

## DE LUXE AMATEUR SET HAS CONTINUOUS BAND SPREAD

### Commercial Type Receiver Has Crystal Filter And Many Other Exclusive Quality Features

Designed for the exacting needs of continuous commercial service, a new RCA communications receiver known as the AR-60 is offered to those amateurs and experimenters who demand the ultimate in precision receiving equipment. Its de luxe features will make it the goal of thousands of advanced amateurs who pride themselves on their equipment.

#### Uses 11 Tubes

Using eleven tubes in an advanced superheterodyne circuit, the new AR-60 has such features as two tuned r-f stages, three tuned i-f stages, crystal filter, frequency range of from 1,500 to 25,000 kc. and continuous electrical band spread throughout the entire tuning range of the receiver. The tuning system is divided into six ranges by means of highly efficient tapped inductances. The three low-frequency ranges employ one tuned r-f stage whereas the three high-frequency ranges have two tuned r-f stages to provide minimum image-frequency response and to prevent blocking from strong signals. Maximum signal-to-noise ratio has been obtained, thus permitting full use of available sensitivity.

#### Regulated Voltage Supply

The first heterodyne oscillator is supplied with a regulated anode voltage to assure steady c-w telegraph reception despite severe changes in line voltage and during "break-in" operation. The i-f amplifier is unique in design, employing three stages of amplification and optional use of a crystal filter with band-width control. This permits rejection of interfering signals a fraction of a kilocycle removed from the desired signal. Automatic volume control may be used for both phone and c-w telegraph reception without any irregularities in characters, or rise in background noise between characters.

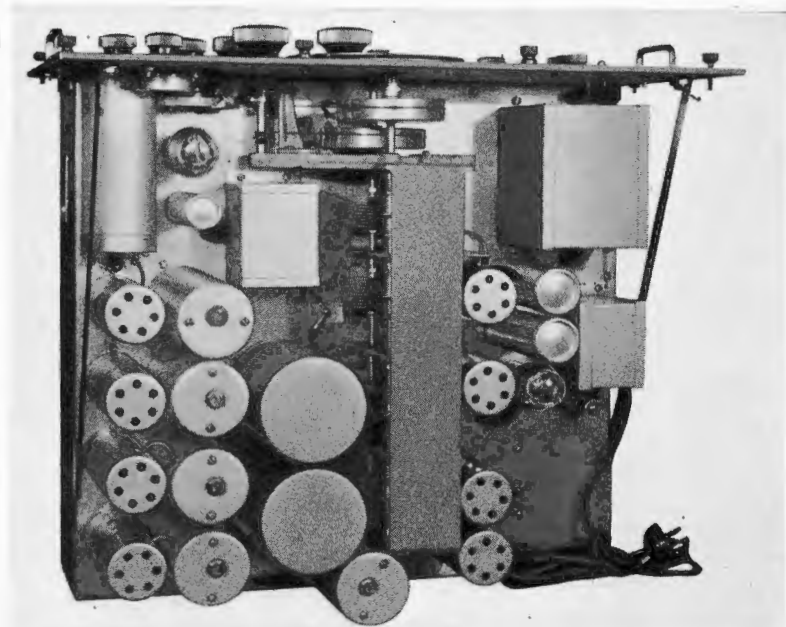
#### Stable Beat Note

Special care has been taken in the design of the second heterodyne oscillator to assure a stable beat note. An audio gain control is incorporated in the output circuit to be used when the A.V.C. is in use. When A.V.C. is not employed, use of the i-f gain control is recommended. By means of an audio filter, use of which is recommended where reproduction of higher or lower frequencies is not required, the output may be peaked at 800 cycles, with a considerable reduction in noise level.

#### Provision for Headphones

Either headphones or a small loudspeaker may be used in the output circuit. Provision is also made for break-in operation.

A complete power supply is incorporated in the assembly for providing complete a-c operation from either 110-volt or 220-volt sources, or the receiver may be operated from batteries. Thorough shielding and filtering insure stability under all operating conditions and free-



The fine workmanship and efficiency of layout are at once apparent when examining the chassis of the AR-60. Note the 8-gang tuning condenser.

dom from unwanted coupling or radiation of the oscillators.

#### Three Types Available

Three different types of mounting are available, namely, a standard rack mounting unit, a standard cabinet type, and a de luxe two-tone gray cabinet type. Electrical specifications are identical.

#### Specifications

Circuit: 11 tube superheterodyne, one and two tuned r-f stages, three tuned stages of i-f. with crystal filter, A.V.C. and audio filter.

Tubes: 4 RCA-6D6, R-F and I-F Amplifiers  
2 RCA-6C6, First Detector and First Oscillator  
1 RCA-6B7, I-F Amplifier, Second Detector and A.V.C.

1 RCA-6F7, Beat Oscillator and Audio Amplifier  
1 RCA-41, Audio Output  
1 RCA-84, Rectifier\*

## SERVICE TIPS DEPLETED STOCK OF RCA PENCILS

But There's a New Lot Of These Prized Items On The Way

If you submitted three or more service tips and haven't gotten your RCA Service Engineer's Pencil or the handsome Pigskin Wallet, please be patient.

The response to the offer was considerably greater than anticipated and our stock of both items was almost immediately depleted. However, there are plenty more on the way and if your tips were good and acceptable, even though we don't print them in RCA Radio Service News, you'll get your award.

#### Handy Device

From all indications, the RCA Service Engineer's pencil is one of the handiest devices ever made available to service engineers. And now, due to an extension of the offer, all you have to do to win one of them is to submit three original Service Tips that will be useful to other members of the service profession. If we can use only one of your tips, the award will be a handsome pigskin pad that includes a memorandum pad and is useful for many purposes.

#### Offer Extended

The new pencils have a number of important improvements. For example, each of the three bands is marked to indicate whether it represents the body, tip or dot color of the resistor. And the material used for coloring is much more durable, thereby eliminating worn color drums.

The RCA Service Engineers' Pencils are the prized possessions of hundreds of Service Engineers. Every engineer needs one, every day of the year and we want you to have one. So don't be bashful with your ideas. If they're good, we want them—and will give one of these amazingly popular pencils in return.

## Windcharger



Erected on top of a house or barn, the Windcharger will keep a 6-volt storage battery continually charged at peak efficiency.

## Wind Driven Charger For Farm Radios

Cuts Operating Cost to 50 Cents A Year, Says Maker

Now the radio listener located away from the power lines can have full-powered radio performance without the inconvenience of taking his battery to town for charging or having it gradually lose efficiency and wear out.

A profitable field awaits service engineers who install this equipment on either new or old sets. It is particularly well adapted to the new RCA Victor 6-volt vibrator-operated farm receivers. For older type 6-volt sets not having a vibrator and normally requiring "B" batteries, the enterprising engineer may easily assemble a vibrator "B" supply by using one of the perfected RCA vibrators and other RCA parts.

#### Keeps Battery Fully Charged

The Windcharger keeps the radio storage battery charged at all times. It employs a generator which operates direct from the wind-driven propeller. As the propeller operates in a very small breeze, the battery may be depended upon to be always in good condition for set operation.

#### Obtained From Manufacturer

Through a special arrangement with the Windcharger Corporation of Sioux City, Iowa, purchasers of the new RCA Victor Battery Models BC6-6 or BT6-5, may obtain the DeLuxe Model Windcharger (for a 6-volt battery) at \$15.00, and a utility model at \$10.00. Service engineers should write direct to the Windcharger Corporation for information concerning the procurement of this equipment for other receivers.

Crystal Filter: Special design permits adjustable selectivity response which gives a high degree of unwanted signal and noise rejection.

Controls: (1) Main tuning; (2) Band spread tuning; (3) Band change switch; (4) Antenna Coupling; (5) Antenna Trimmer; (6) Volume (audio gain); (7) Sensitivity (I-F gain); (8) Beat Frequency; (9) Crystal Filter Switch and Selectivity Control; (10) AVC Switch; (11) CW-Mod. Switch; (12) Audio Filter Switch; (13) Power Switch

Accessories: All cabinet-type receivers are equipped with a ten-foot power supply cord and plug. The rack mounted receivers have a power plug and speaker plug. Receivers are supplied complete with tubes. Additional equipment required includes headphones (or loudspeaker), an antenna, an a-c source of power or a set of batteries.

Power Supply: Built-in. An integral part of receiver. Source 110 volt or 220 volt, 40-60 cycle A.C. External connection by means of battery terminal boards provided for battery operation.

Power Consumption: A-C operation—35 watts. Battery operation—"A" 2.8 amperes at 6 volts, "B" 0.040 amperes at 135 volts.

## NEW BOOK ON CATHODE RAY SHOWS CURVES

Complete Pictures Given For Many Circuit Functions

To meet the need for more practical information on the Cathode Ray Oscillograph, a new book entitled, "The Cathode Ray Tube at Work," has been written by John F. Rider which covers the field perhaps more thoroughly than any other text on this subject. The following authoritative review is published by RCA Radio Service News to keep service engineers posted on the latest literature available covering important development in their profession. This book may be obtained from John F. Rider, Publisher, 1440 Broadway, New York City. The price is \$2.50.

By FREDERICK L. HORMAN  
Instructor, RCA Institutes, and  
Chairman, New York Chapter,  
IRSM

"The Cathode Ray Tube at Work" is a timely text on cathode-ray tube application in the service, maintenance and test fields. It gives an unbiased outline of comparative characteristics of cathode ray equipment available at the present time.

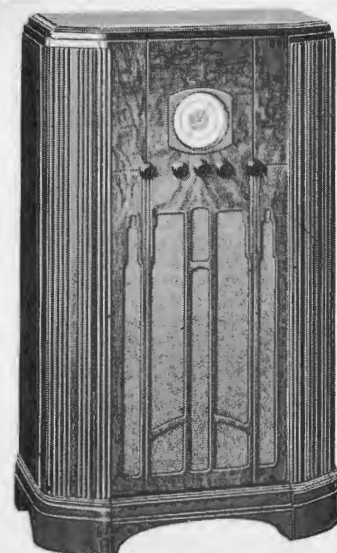
The knowledge imparted in the book will aid technicians, especially in avoiding the errors of improper applications which have retarded the use of the tube in the service and maintenance fields. The book clearly points out and describes, not only the function of the tube and associated apparatus, but also how many important and hitherto hard-to-make measurements and analysis of R.F. and A.F. tube circuits and components are, and can be, made with the cathode-ray tube.

The book is profusely illustrated with photographs of cathode-ray images obtained as the results of all measurements and analysis described.

Aside from proving a valuable aid to the man in the field this well-compiled book supplies a comprehensive and accurate text for use in schools where the tube is of necessity a part of the course of instruction.

The orientals may read backward but there is evidence that they are not backward about antenna systems. Tan Ben Hong, 404 North Bridge Road, Singapore, S.S., reports that he has sold ten RCA Antennas.

## FARM SET



The new RCA-Victor B6-6 is designed for use with a six-volt storage battery which may be kept charged with the Windcharger. This receiver uses a vibrator for obtaining plate power and covers both domestic and foreign broadcasting bands. It is an excellent example of the latest developments in battery sets.



# NEW RCA SETS SHIFT SCALES WITH RANGES

## New Individual Dials Make Tuning Easy on All Bands

Owners of the sensational new RCA Victor Receivers for 1936 are finding that one of the most useful features is the unique Selector Dial found on the medium and higher priced models. The dial is mechanically connected to the range switch so that only the scale for the band in use is visible to the listener. Such an arrangement is a great aid to the person operating the receiver as the elimination of unwanted scales simplifies selection of the desired frequency.

Supplementing the Selector Dial is the two-speed tuning drive which

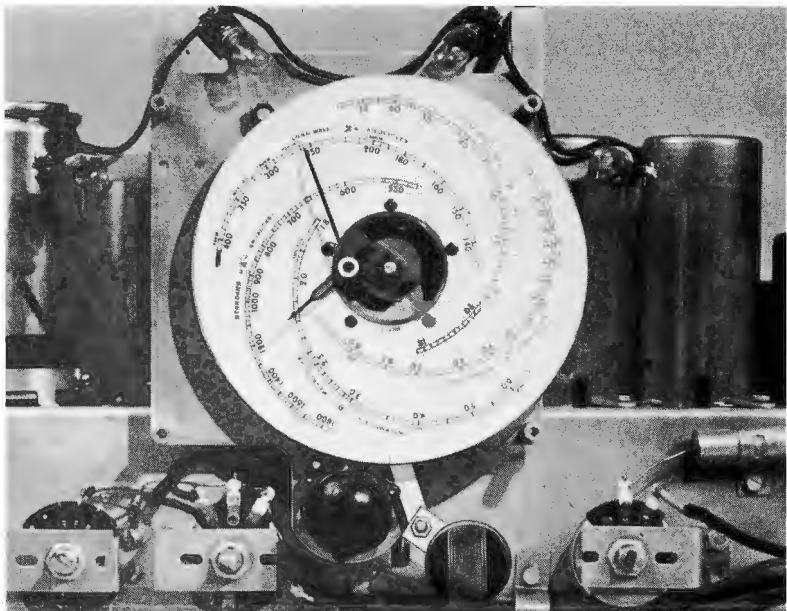
the cradle mounting of the tuning capacitors and mechanical isolation of the dial from the condenser. "Floating" of the tuning capacitor is obtained by having one point of a flexible support at the rear end of the capacitor and two at the front end, the supports being located in a plane that passes through the center of gravity. Such a mounting eliminates any possible tendency of the set to howl due to mechanical vibration of the plates which result in minute electrical changes in capacity. Such a plate displacement from normal may result in a serious howl at higher frequencies. The new floating mounting permanently eliminates this possibility because the capacitor as a whole vibrates and there is no individual plate displacement.

The flexible mounting between the dial and the tuning capacitor eliminates the movement of the dial that formerly occurred when any of the control knobs were operated.

### Fidelity Changes With Bands

Another important feature of the new receivers is the range switch.

While the primary function of the range switch is to change the tuning circuits so that signals on a desired band may be received, an important secondary operation is to change the sensitivity and fidelity



A close-up of the new RCA Selector Dial which is used on many RCA Magic Brain, Magic Eye receivers for 1936. Note the vernier tuner which "spreads" the bands.

permits the listener to tune either rapidly or slowly, the shift being made by a simple push-pull knob. The ratios available are 10 to 1 and 50 to 1, each being ideal for the desired type of tuning.

For the benefit of service engineers it might be noted that an improved fool-proof shifting mechanism is used which eliminates all possibility of trouble from this source.

### Floating Tuning Capacitor

An important design feature of the new Magic Brain Receivers is

on different bands. Sensitivity changes consist of stepping up the sensitivity on the short-wave bands to offset the lower signal strengths of short-wave signals and the lower efficiency of radio circuits at higher frequencies. Fidelity changes are required on the high-frequency bands to compensate for the narrow audio-frequency range of short-wave stations, so that the best possible tone quality will be obtained.

The range switches are of rugged construction and have silvered self-wiping contacts that resist corrosion to a remarkable degree.

## Easy Payment Plan For RCA Service Tools

(Continued from page 1, column 1)

one time rather than buying them separately.

### Many Advantages

"The advantages of having complete equipment for immediate use are many," says Allen. "First, the service engineer can do better work and do it faster, thereby reducing his cost and commanding higher prices. Second, by using RCA equipment he establishes himself as a progressive engineer using the finest equipment, thereby creating greater confidence in his work and, with it, new business. Finally, all service engineers worthy of the name take pride in the perfection of their work. Such perfection comes only through the use of the most modern equipment available.

According to Allen, the plans offered by the RCA Parts Distributors are liberal and the payments are arranged to fit the needs of each individual case.

### Free From Obsolescence

RCA Test Equipment has made an enviable name for itself through its advanced design and modest price. It is practically free from obsolescence. For example, except

# RCA PHOTOPHONE NOW DISTRIBUTES REAR PROJECTORS

## Trans-Lux Rear Projector Equipment Gives Better Pictures

The RCA Manufacturing Company of Camden, New Jersey, has completed arrangements with the

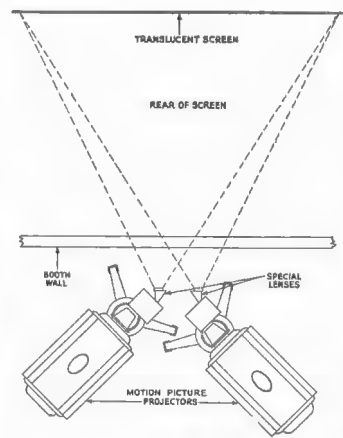


Diagram showing layout of Trans-Lux Rear Projectors

Trans-Lux Movies Corporation, whereby the Company's RCA Photophone Division will handle the leasing of Trans-Lux rear-projection equipment, either in conjunction with its own "High Fidelity" sound reproducing system or with competitive sound apparatus, according to Mr. Edwin M. Hartley, Photophone Manager.

### Ideal for Small Theaters

The Trans-Lux equipment, which will hereafter be termed RCA Trans-Lux, consists of special wide-angle lenses for adapting standard motion picture projectors to rear screen projection, and a patented translucent screen upon which the motion picture image is focussed from behind the screen. An outstanding advantage of the Trans-Lux system is its economical adap-

Leah Ray, another reason for the popularity of blues singers—and another reason people want their radios kept in good condition by competent service men. Miss Ray has been a featured singer with Phil Harris for several years over NBC networks. Station WTAR at Norfolk, Virginia, offered her the first opportunity for radio experience. Miss Ray is an excellent horse-woman and swimmer, and has the unique distinction of being the only woman member of Alpha Tau Omega, a man's fraternity.

tation to the small, intimate type of theatre which need have no expensive balconies or high ceiling clearance. Since the light source is in the rear of the screen, eyestrain caused by looking through the glare of the light rays in a darkened theatre is eliminated, as is distortion from the angle and distance of the throw from the balcony to the screen. With the Trans-Lux system

the house may be kept partially lighted without impairing visibility, and there is no appreciable distortion of the images on the screen from the side or up front seats. The first Trans-Lux installation was made in March, 1931, in New York, and it has been successfully followed by other installations in three other New York City locations, in Philadelphia, Minneapolis and Milwaukee.

## Singer of Blues



## Final Touch to Journey's End



The Sound System at Locustwood Memorial Park, just outside of Camden, N. J., is not only an example of the ability of RCA equipment to fill unusual sound requirements, but it also emphasizes the fact that prospects for RCA Victor Sound Systems are everywhere.

for minor improvements, the design of the RCA Test Oscillator has not changed since its introduction, over two years ago. There have been no changes in the RCA Oscillograph or the RCA Frequency Modulator although they were introduced a year ago. In other words, RCA equipment, being sound basically, does not become obsolete any more than a voltmeter or other basic measuring equipment.

### Low Price

Because of the tremendous facilities of the RCA Manufacturing Company and the wide distribution

of its products, the prices of RCA Test Equipment are remarkably low, considering the high quality and exacting standards to which they are manufactured. For example, while the RCA Test Oscillator weighs only five pounds and uses self-contained batteries, it nevertheless has performance comparable to many signal generators. Its low leakage, high output and accuracy of calibration are features that are essential to proper servicing of the involved and complicated receivers on the market today. And the low price of \$34.50 places it within the reach of all service engineers.

# NEW NUMBERS USED ON RCA INSTRUMENTS

## Cabinet Style and Number of Tubes Disclosed by Model Number

"C15-3" may be just an arbitrarily-chosen model designation to some people, but to anyone knowing the new numbering system used on RCA Victor 1936 receivers it indicates that the model referred to is a fifteen tube console, having chassis number 3 of the 15 tube series. The merits of this system are obvious, as it not only indicates the type of cabinet, but also discloses the number of tubes used and the chassis number.

Each model is designated by a letter, a number, and another number separated by a dash, as, for example, Model T10-1. The letter indicates the cabinet style, "T" being used for table, "C" for console and "D" for combinations. In the battery models, "BC" indicates a battery console, while "BT" indicates a table type battery receiver. The first number following the letter indicates the number of tubes, and the number after the dash identifies the receiver with respect to other models having an equivalent tube complement. In the example of T10-1, we have a ten-tube table model, the first such ten-tube table model produced under the new numbering system. Similarly, Model C15-3 is a fifteen-tube console having chassis number 3 of the series.

## SOUND IMPROVED WITH RCA 16-MM OPTICAL REDUCER

An efficient optical-reduction printer system for the production of high-quality 16-millimeter sound prints from standard size negatives is being offered to printing laboratories by the RCA Manufacturing Company, according to an announcement by Edwin M. Hartley, Manager of the RCA Photophone Division.

Among the film laboratories and producers who have already contracted for the new RCA optical-reduction system are Cinelab, N. Y. C.; Metropolitan Motion Picture Company, Detroit; Burton Holmes, Chicago; Pathe Exchange, Bound Brook, N. J.; and Tri-State Motion Picture Company, Cleveland, Ohio.

The new system makes possible higher quality sound than has ever before been possible on 16-millimeter film, because it eliminates the losses introduced by the numerous processing steps involved in re-recording. Also, it improves on earlier optical reduction printers by employing an optical system which reproduces the sound track in both the transverse and longitudinal planes, instead of only in the width, an outstanding improvement.



### Sings On RCA Hour



Helen Jepson, who is appearing as guest artist of The Magic Key Program of RCA. Miss Jepson's voice probably will be heard from Hollywood where she is making her first motion picture. Magic Key broadcasts will be heard Sundays at 2:00 p.m., E.S.T., over an NBC-WJZ network and will co-feature famous artists and entertainers of radio, stage and screen and the technical developments in the equipment that bring their voices to radio audiences all over the world.

## RCA MAGIC KEY PROGRAM TO BE HEARD SUNDAY

(Continued from page 1, column 5) the medium of RCA sound picture equipment. Their broadcasts will be available to the entire world through world-wide communication facilities of RCA. Some of the broadcasts will be picked up from foreign countries and from ships at sea. The series will present such outstanding artists as Kirsten Flagstad, Lauritz Melchior, Lotte Lehmann, Rose Bampton, Helen Jepson and Giovanni Martinelli of the Metropolitan Opera Company; Sergei Koussevitzky and the Boston Symphony Orchestra; Leopold Stokowski and the Philadelphia Symphony Orchestra; Paul Whiteman and his orchestra; John B. Kennedy, NBC commentator; Albert Spalding, violinist; Dr. Walter Damrosch and Dr. Frank Black, conductors; Conrad Thibault, baritone, and Fats Waller. There will be an array of stage, screen and radio favorites. The list of dance bands will include those of Ray Noble, Richard Himber, Benny Goodman, Enric Madriguera, Jan Garber, Jolly Coburn and Xavier Cugat. This program, of a scope never before attempted, will impress the public still further with the quality of RCA products. Service engineers will find it even easier to sell RCA parts, tubes and instruments.

### Chart Given Free At All RCA Meetings

Free distribution of two wall charts and a new technical bulletin on RCA Metal Tubes is but one of the reasons for the large attendance at the second series of service meetings now being conducted by the RCA Service Division throughout the country. Major meetings are being held in 65 different cities, with secondary meetings in many others. The subject of the new meetings is "Metal Tubes—Their Design, Manufacture and Service." While there have been previous discussions of metal tubes at various service meetings, much new and important information on these unique devices is being released for the first time. Service engineers attending the meetings are well rewarded for their time.

## METAL TUBES GIVE BETTER PERFORMANCE

### Higher Gain and Quieter Operation Obtained With Tubes "Sealed in Steel"

Designed for radio, from base to grid cap, aptly describes the new RCA All-Metal Tubes. While the old glass-type tubes were excellent within their limitations, they were nevertheless an off-spring of the incandescent lamp. At the time of their development, the incandescent lamp was the only device which was manufactured commercially in which a vacuum could be maintained. While its weaknesses from a radio viewpoint were corrected as far as possible, certain fundamental difficulties were never entirely overcome. These difficulties centered around shielding, envelope charge and high-frequency operation. The answer to this question, which was of fundamental importance to the whole radio industry, is metal tubes, the greatest advance in tube design since their inception.

#### Eliminates Charge

The electrical improvements in metal tubes are many, the most important being perfect self-shielding and elimination of the charge which accumulates on the glass shell of the older style tubes. Shorter internal leads reduce inter-element capacity and give more efficient operation at the higher frequencies, a very desirable characteristic in view of the trend of receivers toward increasingly wider frequency ranges. The permanence of the shielding of metal tubes permits design engineers to operate the tubes at higher gain without the possibility of oscillation difficulties.

#### Rigid Supports

Obviously, the most important mechanical feature of today's latest tube development is the steel shell, which gives rise to the slogan, "sealed in steel" and which eliminates glass breakage. The short-

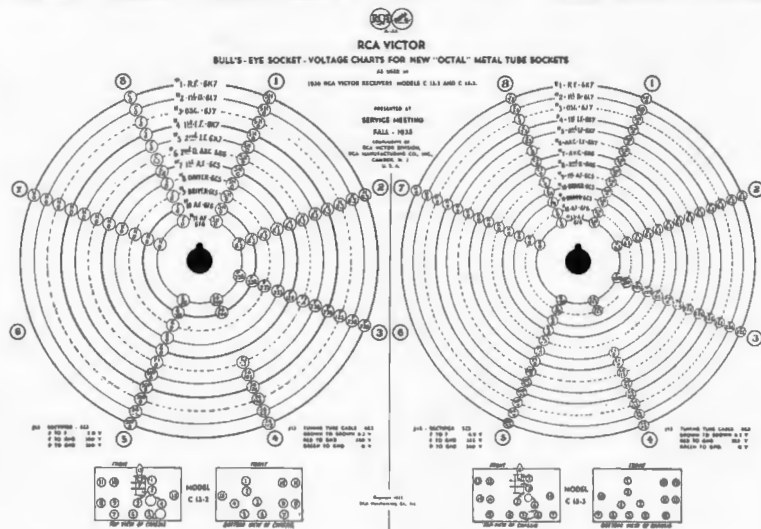
ness of the electrode supports made possible by the increases in the rigidity of the elements and decreases the possibility of vibration. The improved Octal base permits easier insertion and provides a standard pin position for all tubes. Another important feature is small size, permitting a reduction in chassis space, shorter and more direct leads, and better location for critical parts. Due to the space saving feature, the need for multi-purpose tubes with their sacrifice in electrical performance is eliminated. And last but not least, as all the world knows, metal is easier to work than glass. Much closer tolerances can be maintained with metal, a fact which leads to greater uniformity and better all-round tube performance.

## EUROPE LAGS U.S. IN RADIO SAYS SARNOFF

### Radio Rapidly Gaining, Although Prices High, Says RCA Head

Research in radio and television in Europe is not as far advanced as in America, David Sarnoff, chairman of the board of National Broadcasting Company and president of the Radio Corporation of America, said recently on his return from a two-month visit abroad. "I studied the technical developments in the important radio laboratories in Europe and saw their latest television experiments," he said. "While interesting research work is being done along these lines in several European countries, the progress being made in our own country is in advance of anything I saw abroad. America continues

## FREE "Bull's-Eye" Charts



The "Bull's-Eye" chart is the first of a unique series of diagrams whereby the voltage of each tube prong to ground is quickly determined on the majority of RCA Victor Radios. RCA Parts Distributors are arranging service meetings at convenient locations and opportune times throughout their territories. Keep in touch with them so that you will not miss any of these interesting and instructive lectures and obtain your free chart.

## The Card of the Month

PUT A KICK IN YOUR RADIO with one of our antenna-alignment specials

You are sure to get remarkably improved performance from almost any radio set after we have installed a scientific antenna and restored the circuit alignment to factory-precision standards. You can depend on the quality of our work—we use genuine RCA Antennas and Parts. A phone call will bring a representative.



YOUR IMPRINT HERE

Above is shown in reduced size a postcard that has what it takes to get real inquiries from a mailing list. Stamped and imprinted, these cards cost only \$1 per 100 from RCA Parts Distributors, or direct from Camden, N. J. Ask for Postcard Form No. 144.

## MAGIC BRAIN CHECKER ROBOT MEETS PLAYERS

### Mysterious Checker Playing Robot to Be at Radio Shows Throughout Country

"Ajeeb," the mysterious, undefeated, RCA Magic Brain checker-playing robot, whose secret mechanism was originally devised by a Hungarian nobleman 167 years ago,

## "Ajeeb"—The Magic Player



Still undefeated, "Ajeeb," the mysterious robot checker player, will be a feature at all radio shows this fall. A new RCA Magic Brain receiver goes to anyone who can defeat "Ajeeb."

control may be uttered, nor may any difference with their opinions be expressed.

"But despite these restrictions and repressions, radio programs continue to cross the borders and are increasingly welcome visitors in European homes. The increase in short wave transmission has brought to the people on the European continent the realization that through their radio receiving sets they can come to know more about themselves, their neighbors and those far away.

"They realize today that, like the automobile, the radio set is no longer an experiment. It has become a necessity of modern life—the window at which the family sits and views the world."

Business conditions in general, he found, are showing an upward trend, particularly in England. But political uncertainties, he said, are retarding progress and stand in the way of economic recovery.

## Pardon Us

In the last issue of RCA Radio Service News a Service Tip from Mr. Hal H. Jacobs of Portland, Oregon, showed a suggested condenser tester. The diagram showed the grid and plate connected to the a-c line as well as the neon tube. Correctly, the connection to the a-c line should be omitted.

is one of many sensational features that are causing the RCA booth to outdraw all others at radio and electrical shows throughout the country.

Fresh from new triumphs at the Atlantic City Million Dollar Pier, the Grand Central Palace in New York, and Philadelphia's great Convention Hall, the Magic Brain Checker Player is impatient to match wits with the champion checker players of other sections.

#### Challenges All Comers

A new RCA Victor Magic Brain radio receiver with the new Magic Eye and metal tubes, is being offered as a prize to anyone who can defeat this heretofore invincible enigma. Checker champions in various sections of the country will have an opportunity to try what the great Napoleon Bonaparte, Edgar Allen Poe, Houdini, O. Henry and many of the crowned heads and checker luminaries of Europe were unable to accomplish throughout Ajeeb's colorful and "checkered" career.

Ajeeb, which is Hindu for mysterious, had been in retirement for two decades prior to his recent reincarnation, but the marvels of modern radio so attracted him that he came out of his retirement to strike up an alliance with the famous RCA Victor Magic Brain. He squats cross-legged to play his opponents and moves inexorably, swiftly and surely. Be sure and see "Ajeeb" at your radio show.

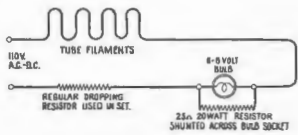


## SERVICE TIPS

Now you can win your choice of a handsome pigskin wallet or an RCA Service Engineer's Pencil by sending tips to RCA Radio Service News, Camden, New Jersey. . . . If you send only one tip, and it is accepted, you will receive the pigskin wallet. If you send three tips all of which are acceptable to the Technical Editor, you may have your choice of the Pencil or the Wallet. Be sure to specify which you want . . . All tips become the property of RCA to be used as they see fit . . . Service Tips are our reader's ideas, not ours. While RCA Radio Service News believes they are worthwhile, we cannot be responsible in any way for results obtained.

### Halsol Model AC-DC Midget Dial Lamps

Halsol AC-DC Midget and other sets make use of odd-size dial bulbs in series with the tube filaments which are very difficult to obtain. I suggest shunting a resistor across



the dial bulb socket and using a standard size 6-8 volt bulb as shown in the diagram below. Also with this hookup the set will operate even though the dial light has burned out.

Albert N. Giddis,  
128 Crawford St.,  
Lowell, Mass.

### Bosch Model 360

I have had several American Bosch All Wave Receivers Model 360 brought in which would oscillate severely after being used a few minutes. As soon as they are touched on the bench, they begin to work for a few minutes. Then off they go to a violent squeal. The grounding of condensers and resistors particularly in the cathode of tubes is to a lug which is held by a rivet through the tube shield, chassis plate, tube socket and lug. This is apparently a good ground, but it is not so all of the time. I drill a hole in the chassis and bolt a lug to the chassis, then solder a jumper to the old ground of socket. I do this with each ground. This eliminates a chance of future trouble. This applies to other sets of similar construction.

Ralph E. Sanford,  
M. H. Sanford & Son,  
Arena, N. Y.

### Auto Antenna Lead

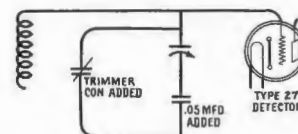
Many men use a great deal of shielded lead-in on Auto Radios, especially Convertible Coupes. This cuts down the Signal strength and produces a loud hiss. To overcome this, run RCA transmission line from the aerial to the set covering the last 18 inches with a shield loom and grounding both ends.

S. A. Gartrell,  
Darien Electrical Co.,  
Darien, Conn.

### Philco Model 65 Cross Modulation

Cross modulation (powerful local stations breaking through other stations being received) may be remedied as follows:

1. Add a variable trimmer capacitor across the variable condenser that tunes the detector grid circuit (27 tube).



2. A .05 mfd. capacitor is connected in series with this same tuning condenser.

3. The trimmer is then adjusted for maximum signal.

This is similar to the way the oscillator condensers are adjusted on later model superheterodynes and has been found very effective on this early model.

Mr. Glocksberg,  
L & M Radio & Supply Co.,  
331 Collinsville Ave.,  
E. St. Louis, Ill.

### RCA Output Meter Change

Installation of a .5 mfd tubular inside my RCA output meter in series with high output enabled me to clip from ground to output tube

plate without danger of injuring the potentiometer. This saves a lot of time. There is room inside of case for the condenser.

James V. Clark,  
Clark Radio Service,  
Granville, Ohio.

### Ford V-8 Ignition Noise

To overcome very stubborn cases of ignition trouble in Ford V-8's, take the two hot leads from the distributor and generator and draw them out of the cable they are in and run them on the outside of the cable, taping them down. These leads are colored red and yellow and black.

S. A. Gartrell,  
Darien Electrical Co.,  
Darien, Conn.

### Magic Eye Output Indicator

Recently I saw a good application of the Magic Eye tube used in the new RCA Victor receivers, which was used as an output meter. The

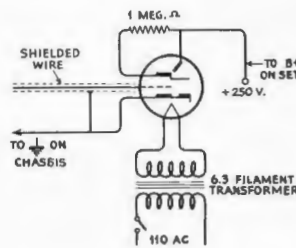


illustration shows the manner in which this was done and the trimmers are adjusted for the maximum amount that the Magic Eye will sharpen. The shielded wire is connected to the AVC bias circuit.

Edward C. Abounader,  
639 Elizabeth Street,  
Utica, N. Y.

### RCA Victor Model 242 Fading

Past experience has proven that about 80 per cent of the complaints received were from fading. It fades either completely or intermittently.

The main cause for fading in these models I have found to be the open circuiting of the .01 mf condensers used in the R-F and I-F grid return to ground circuit. A replacement of the faulty condenser or all of them, invariably cleared up the trouble. When replacing all condensers, I have found that by using a 0.1 mf condenser, instead of the specified values, the overall gain is increased considerably.

A. Rothman,  
925 Avenue T,  
Brooklyn, N. Y.

### Testing Speakers

Distortion in receiver caused by the defective speakers may be quickly checked by the following tip:

Insert a magnetic speaker in series with the plate of the final audio tube, disconnecting the voice coil of the suspected speaker if a dynamic is used. By using a point-to-point analyzer the magnetic speaker can be connected without disturbing the set connection.

Russell Rude,  
4609 W. 5th Street,  
Duluth, Minn.

### Motor Noise

In one of the new Ford V-8's there was a motor noise that could not be eliminated by any of the usual procedures. The only way I could clear this up was by shielding the resistor in series with the high tension coil, this resistor being under the dashboard. It gets hot when the car is operating.

Chas. Massie,  
Arma, Kansas.

### Slipping Dials

If you get a receiver with a friction drive dial which has been oiled too much, causing it to slip at different points on the dial, get a small box of Fuller's Earth at your druggist's and sprinkle some of it on the friction parts of the dial. In a few seconds the dial will work like new.

Wayne Storch,  
Beecher,  
Illinois.

### Sears, Roebuck and Montgomery Ward Battery Sets

When looking for one of those hard-to-get driver transformers for battery sets using a Class "B" output stage of two 30's or one 19, try RCA Stock No. 6710 Transformer (list Price, \$2.22). It'll do the job better, costs less and is much easier to obtain.

Zimmerman Wholesalers,  
Hagerstown, Md.

### Farm Lighting Plant Interference

In installing 32 V farm sets, considerable complaint of ignition interference will be encountered if proper shielding is overlooked. For an efficient and economical plan that will prove satisfactory, obtain an adequate supply of Model A Ford condensers (if regulation type capacitors are not available), installing one at each commutator brush, both sides of coil and each outlet and entrance at breaker point box. Make sure all wiring is short as possible from coil to plugs, etc. Use heavy-duty type shielded ignition cable only for these connections, otherwise the spark will ground out before reaching plugs. Ground frame of plant. Run aerial at right angles to source of noise where possible. Bear in mind that isolated plants always shield easier than jobs under same roof.

J. B. GORDON,  
San Jon Garage,  
San Jon, New Mexico.

### Clean Chassis

When a radio set comes into my shop the first thing I do is to thoroughly clean it, and in most cases they need it badly. I have a small hand air pump to rough clean the entire chassis and speaker, and this is especially good to get the dirt and dust out of the hard-to-get-at places. I then finish cleaning with a soft cloth. The condenser gang is cleaned with pipe cleaners and the tube contacts are also checked and cleaned. The entire set will dissipate heat better and will also work better when it is clean. This procedure only takes a few minutes and the customer is always pleased to see the set looking like new again.

P. J. ROBISCHUNG,  
1812 March Street,  
Kalamazoo, Mich.

### Tip on Tuning Wand

When you try to insert the RCA Tuning Wand in one of the new RCA Victor 1936 Magic Brain Receivers, don't get blue. While it looks impossible with the chassis in the cabinet, here's a little tip that will permit you to make it work.



Get out the old hack saw, cut the wand in half and then secure the half sections together by means of an appropriate steel spring as shown in the illustration. This permits the wand to be easily inserted into the coil shields, or removed for inserting the other end. The catalog No. 6679 Tuning Wands—Net Price \$1.10, now in stock—have a spring in the middle.

# AMPLIFIER GIVES 20 WATT OUTPUT WITH 108 DB GAIN

## Overall Distortion Less Than 6%—Frequency Range Extends From 50 to 10,000 Cycles $\pm 1/2$ DB

Extreme flexibility, small size and excellent operating characteristics feature the new RCA All-Purpose Amplifier recently announced by the RCA Commercial Sound Section. Designed with the most severe requirements of the commercial sound field in mind, the RCA All-Purpose Amplifier is unique in its ability to fit any type of installation whether it be a public-address, phonograph-reproduction or radio-distribution system.

### High Gain

The MI-4281 (All-Purpose) Amplifier System has sufficient gain to give full output from an RCA Inductor Microphone, an RCA Velocity Microphone, a Sound Powered Microphone, a magnetic pickup, or the output from the detector of a radio receiver. The gain is also sufficient to permit the use of the microphones for sound re-enforcing in theatres or other places where desirable. The over-all

of audio amplification, microphone volume control, master volume control, tone control, music-voice switch and provisions for phonograph input.

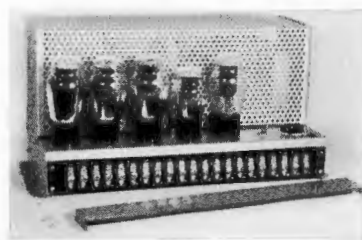
The input transformer has taps for matching two impedance inputs, 250 ohms or 500 ohms. This transformer is mounted in a specially designed nickeloxy case which can be rotated by the person installing it to reduce the pickup from any stray magnetic field to a minimum. An additional feature is the variable compensator on the last stage of the voltage amplifier which permits the high-frequency response to be reduced by any desired amount.

### Power Amplifier MI-4256

The power amplifier contains the power transformer, two rectifier tubes, two output tubes, driver tube and the output transformer. A terminal board having 21 screw terminals for connecting in the speakers and making voltage connections to the voltage amplifier is provided on the front apron.

The output transformer is the type commonly known as the "balanced center-tap-to-ground." It is ruggedly built and designed to reduce excess talk to a minimum when the units are used on separate channels and the output wires carried in the same conduit.

A unique feature is the use of two rectifiers. One of these supplies the necessary plate and grid voltages to the various tubes while the second rectifier supplies fixed bias to the power tubes and field excitation for either one or two 1000-ohm speakers connected in series. It is interesting to note that while the power amplifier is rated at 20 watts, the unit is capable of taking a peak load of 35 watts.



Power Amplifier Showing Terminal Strip

gain from 250 ohms input to 15 ohms output is 108 db.

### Built In Two Units

To increase flexibility and reduce hum to a minimum, the amplifier has been built on separate bases in chassis form. This type of construction makes it possible for one Voltage Amplifier to drive as many as four power amplifiers, making a total of 80 watts output. It also gives flexibility in mounting. If desired, the amplifier may be fitted to a standard rack. All controls and terminals are on the apron of the base, making the units readily adaptable to any desired type of mounting.

The amplifier system has its own power supply for operation from 50 or 60 cycle commercial 110-volt lines. The input is fused. The power consumption is 130 watts.

### Voltage Amplifier MI-4231

The voltage amplifier contains the input transformer, three stages

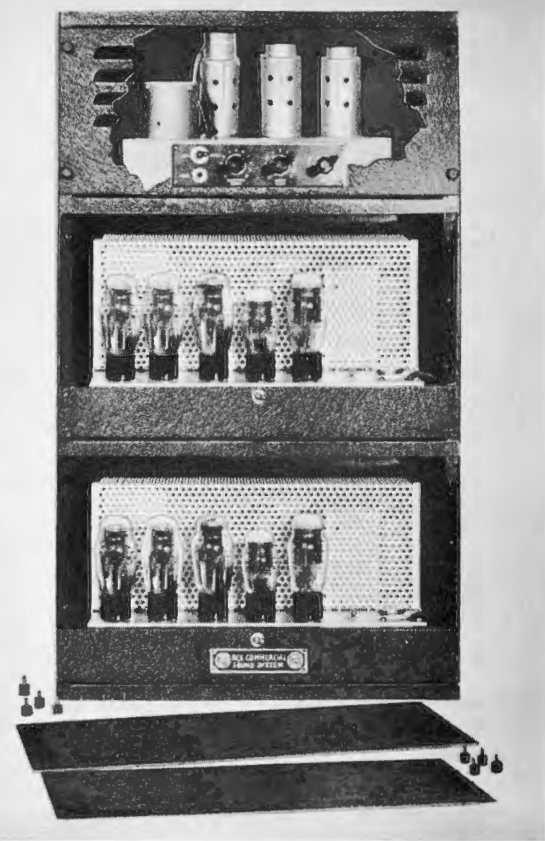
### Specifications

Radiotrons	1 RCA-57	Voltage Amplifier
	2 RCA-56	Driver Stage
	1 RCA-59	Output Stage
	2 RCA-2A3	Rectifier
	1 RCA 80	Rectifier
	1 RCA-83	Rectifier

Input Impedance—  
250 ohms or 500 ohms.  
Power Output—  
20 watts + 32 DB. Output Level.  
Gain—  
108 DB.  
Frequency Response—  
 $\pm 1/2$  DB., 50-10,000 cycles.  
Power Consumption—  
130 watts.

## Small But Powerful

RCA  
All-Purpose  
Amplifier  
Is Shown  
Mounted in  
Cabinet with  
an extra  
20 Watt  
Amplifier  
thereby giving  
40 Watts  
Output





# MODERNIZATION OF OLD RADIOS BRINGS PROFIT

## Increasing Low Response And Adding AVC Easily Done

Lacking the money to buy a new, high-priced instrument, or, perhaps, having a sentimental attachment for the old radio, many a set owner would find an agreeable solution in the addition of the latest convenience and performance features to his present set at relatively low cost.

Here, indeed, is a market made to order for the service engineer. While not to be compared with the cost of a new receiver, the jobs represent a substantial income and profit to the service engineer. And they are easily done.

By using RCA Parts, such features as increased low frequency response, manual compensation, addition of automatic volume control, diode detection and many others may be added to receivers not having such characteristics originally.

The following features show some of the possibilities in this direction. Others will suggest themselves to the wide-awake service engineer.

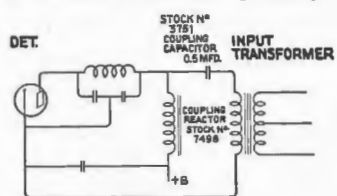
### Hum Reduction

The RCA Stock No. 8911 Filter Reactor (List Price, \$3.15) is char-

acterized by an extremely low d-c resistance—59 ohms—although its a-c impedance at 60 cycles is 4700 ohms. It is capable of carrying large values of direct current. Many radio service engineers find this choke a valuable asset as a means of additional series filtering for the power supply with a very low voltage loss. Adding this filter to circuits normally having only the speaker field as a reactor, greatly increases the filtering of the circuit with a consequent reduction in hum.

### Increasing Low Frequency Response

A considerable increase in low-frequency response may be obtained in receivers using transformer-coupled audio stages by adding a parallel feed for the detector plate circuit, thereby removing the direct current from the primary of



the audio transformer. The parts required for such a conversion are:

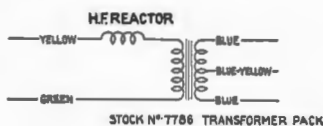
- |   |                   |
|---|-------------------|
| 1 Stock No. 7498 Choke ..                 | List Price \$2.05 |
| 1 Stock No. 3751—0.5 mfd. Capacitor ..... | .40               |

The diagram, applicable to a large number of receivers, shows the proper manner of making the connections.

### Increasing High-Frequency Response

By replacing the usual inter-stage transformer in a receiver using a push-pull output stage, with the RCA Transformer-pack Stock No. 7786, List Price \$4.25, the high-frequency response of most receivers may be materially increased without altering their selectivity. This transformer includes a choke, tuned to the higher end

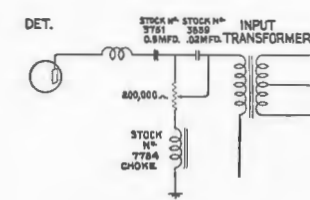
of the audio band, thereby materially increasing the output of their frequencies.



### Adding Low-Frequency Tone Control

A good low-frequency response is not always an unalloyed asset. It is often desirable to reduce that low-frequency response to avoid rumbling and hum present in the carrier wave of some stations, and to decrease the boom in voice, present in receivers having excessive response in the voice-frequency range.

The suggested method, applicable to receivers using an audio system having at least one coupling capacitor, is to connect two coupling capacitors in series (0.5 mfd. for maximum lows and 0.02 mfd. for minimum lows). A 200,000 ohm tone control connected across the 0.02 mfd. capacitor shorts it out, thereby increasing the low response. The addition of the Stock No. 7784 low-frequency choke, connected in series with the tone control, increases the low response further as the 0.02 mfd. capacitor is shorted out.



- |   |                   |
|---|-------------------|
| Stock No. 7784 Choke .....              | List Price \$1.30 |
| Stock No. 3639 Capacitor—0.02 mfd. .... | .25               |
| Stock No. 3751 Capacitor—0.5 mfd. ....  | .40               |

### Diode Detection and Automatic Volume Control

Diode detection, greatly eliminating demodulator distortion, and automatic volume control are two major features of modern receivers. Adding these features greatly improves the operation of receivers not having them. The following material is required for a typical installation.

- |          |                                      |            |
|----------|--------------------------------------|------------|
| Quantity | Stock No.                            | List Price |
| 1        | 6484 I-F Transformer (175 kc.) ..... | \$1.70     |
| 1        | 6485 Volume Control (Tapped) .....   | 1.20       |
| 1        | 3634 Capacitor (160 mmfd.) .....     | .34        |
| 1        | 3616 Capacitor (300 mmfd.) .....     | .34        |
| 1        | 6282 Resistor (60,000 ohm) .....     | .20        |

The i-f transformer is especially close coupled, and is designed to feed a high-gain 58 Pentode into

# TUNE-UP HELPS SELL SERVICE FOR ENGINEERS

(Continued from page 1, column 1)

ducted by service engineers to their customers by means of two mailing pieces furnished at postage cost. Samples of these postcards are shown on this page.

4. Special "Tune-Up Plugs" on RCA Radiotron spot broadcasts three times a week over 20 NBC key radio stations, plus a plug three times a day over all stations owned

or operated by NBC, will advise the customer to see his service man or dealer for a special radio set "Tune-Up."

### Sets Require New Tubes

Surveys have shown that 38 per cent of all radio receivers are in poor condition, requiring new tubes, new parts or a general overhauling. By offering a definite amount of service for a definite price, the service engineer can successfully exploit this large market. The charge of \$1.50 has been found most effective, and is high enough to cover the service engineer's costs for the services offered. The \$1.50, however, is not the chief profit derived from the Tune-Up; the profit lies in the additional service work uncovered and the sale of RCA Tubes and Parts for replacement, for which a regular charge is made.

This campaign has been proven in tests conducted in a number of key points throughout the country. Its results have been sensational. Complete details of the plan are available from the RCA Radiotron Distributors who are located in the 39 key cities where the campaign is to be featured. These distributors are arranging the tie-in of the local advertising and the supplying of cards for direct mail purposes. See your distributor at once so that your participation will be assured.

### Order from Camden

Dealers and service engineers living outside of areas covered by local advertising may obtain tie-in ad mats and the two direct mail pieces direct from RCA Radiotron Division, Camden, N. J., to tie in with the spot announcement and the magazine campaign. The charge is \$1.00 per 100 cards for the Government stamped postcards. The special letter with business reply card (imprinted at four different places) is \$1.50 per 100. However, the service engineer or dealer must obtain from his local post office permission to have a business reply stamp printed on this card. This permission must accompany the order.

By obtaining permission from the post office, this card may be sealed with a precancelled stamp.

On page eight of the Sept. 1935 issue of RCA Radio Service News, the transformer advertisement showed the Stock Number of the Universal Output Transformer for tropical use as Stock No. 9853. Actually this should be 7853.

## Helps To Sell Service

# 250 STANDARD RADIO TUNE-UP 150

### What you get

1. Inspect and clean chassis
2. Check speaker and connections
3. Check all power connections
4. Test and label all tubes
5. Clean interior of cabinet
6. Check aerial installation
7. Inspect aerial and ground connections
8. Inspect lightning arrester
9. Clean and polish radio set
10. Free estimate of any additional repairs

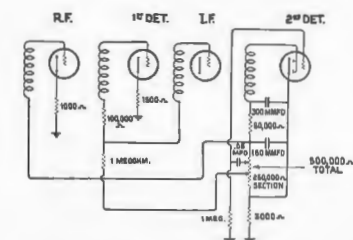
## ALL FOR ONLY \$1.50

GET YOUR SET IN ORDER FOR THE BIG FALL PROGRAMS

(SPACE FOR YOUR IMPRINT)

This card helps you sell service tubes and parts. Order through your RCA Radiotron Distributor or direct from Camden, N. J. Imprinted on government stamped postcards for \$1.00 per 100. Ask for Tune-Up Card No. 1.

a diode detector tube at maximum energy transfer. By using this transformer, any superheterodyne having a 175 kc. intermediate stage may be changed to diode detection using a 55, 2A6, 2B7 or similar 6-volt tube. The remaining part of the kit may be used for adding A.V.C. with this same change. Such a change eliminates troublesome r-f volume controls, the low end of the control being tapered so as to give even graduations over the entire scale. The volume control has four tapped connections meeting all A.V.C. grid voltage requirements. The diagram shows the proper manner of making these connections.



### Manual Compensation

During the last few years, the trend of radio and phonograph reproduction has been to alter the characteristics as the volume is reduced. This is to compensate for the changes in the sensitivity of the human ear at different frequencies for different volume levels. Usually this compensation takes the form of reducing the middle register of the audio range a greater amount than the high and low frequency reproduction as the volume is reduced.

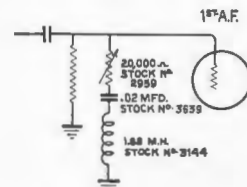
While it is difficult to add such automatic compensation to a radio set not already having it, manual compensation nevertheless may easily be added. A great improvement in tone is the direct result.

The parts required for adding such compensation to any receiver

having more than one audio stage are:

- |   |                   |
|---|-------------------|
| 1 Reactor Stock No. 3144 ..                       | List Price \$1.20 |
| 1 Capacitor—.02 mfd. Stock No. 3639 .....         | .25               |
| 1 Variable Resistor—20,000 ohms Stock No. 2959 .. | 1.15              |

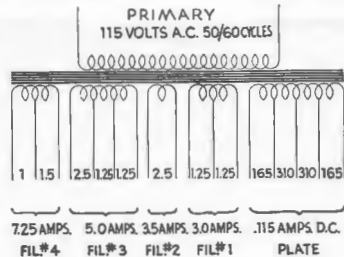
These are connected between grid and ground of the first audio stage.



The amount of resistance in the circuit determines the amount of compensation and should be adjusted to suit the wishes of the listener.

### Heavy Duty Power Supply

A heavy duty power supply capable of handling a load of 115 ma. at 400 volts may easily be built



around RCA Universal Power Transformer Stock No. 9552, List Price \$6.50. This transformer is of heavy duty, rugged construction and makes an ideal basic unit for a Class "B" or 2A3 power supply. Many "hams" find this transformer excellent for power supply requirements in their transmitter as it will stand a high factor of overload.

## Gets Results

### Get Your Radio Ready FOR THE FOOTBALL GAMES!

Don't run the risk of missing a single play of the games! We offer football fans the following special service:

1. Inspect & Clean Chassis
2. Check Speaker & Connections
3. Check All Power Connections
4. Test & Label All Tubes
5. Clean Interior of Cabinet
6. Check Aerial Installation
7. Inspect Aerial & Ground Connections
8. Inspect Lightning Arrester
9. Clean Radio Set
10. Free Estimate of Any Additional Repairs.

### SPECIAL PRICE \$1.50

Don't delay. Phone or call. Enjoy radio at its best!

### DEALER'S NAME

This free mat is part of the Tune-up Campaign. Supplied by your RCA Radiotron Distributor or direct from Camden, N. J.

## A Business Builder That Works Every Time

**A STARS AND STATION BOOK**  
Will Tell You!

Use the Coupon Enclosed  
**GET A RADIO SET TUNE-UP AT A SPECIAL PRICE**

What We Do:

1. INSPECT AND CLEAN CHASSIS
2. CHECK SPEAKER AND CONNECTIONS
3. CHECK ALL POWER CONNECTIONS
4. TEST AND LABEL ALL TUBES
5. CLEAN INTERIOR OF CABINET
6. CHECK AERIAL INSTALLATION
7. INSPECT AERIAL AND GROUND CONNECTIONS
8. INSPECT LIGHTNING ARRESTER
9. CLEAN AND POLISH RADIO SET
10. FREE ESTIMATE OF ANY ADDITIONAL REPAIRS

# YOUR IMPRINT

YOUR NAME HERE  
STREET & NUMBER  
CITY & STATE

Dear Radio Listener,  
Having old radio sets requires little care in our business and we have discovered that most radio troubles are caused by lack of just ordinary care of the radio set.

It is to be sure, in the ordinary course of the world, radio do not wear out. If the ground and aerial connections are kept tight, the volume control kept free of corrosion, etc., and the tubes replaced when worn, the set will be in good condition. This simple thing is all that is usually necessary. This simple thing is all that is usually necessary. This simple thing is all that is usually necessary.

Every radio set should have a "Tune-Up" at least once a year.

Our regular charge for such "Tune-Up" is \$2.00. We have a special charge for our service so that we can afford to do the work and to be honest with our customers.

Therefore, if we could save time and gasoline by making several "Tune-Ups" in one day on the same neighborhood, we could charge less. This month in our "Radio Tune-Up Month" one of our service men will be making in your neighborhood. Please repair bills by letting this coupon below to get a "Radio Tune-Up" at special price. Look on the back name to see what this involves.

Just mail the coupon—no postage needed—no show us later. This offer is good in your neighborhood only for one week.

Sincerely yours,  
RCA Radiotron

**GOOD FOR ONE DOLLAR**

When mailed or presented within 30 days to person named below, we will repair \$2.00 Radio Set Tune-Up.

Customer: I use your Radio Set Tune-Up for \$2.00. Please see me when you can.

NOT TRANSFERABLE

Four imprints on this effective mailing piece give distinctive individuality.

Be sure to send your Business Reply Card Permit Number. When ordering this letter, ask for Tune-Up Card No. 2.

Increase your income by using this letter. It has been tested in several key cities and the results have been amazing. Imprinted at four places with your name, address and phone number. The price is \$1.50 per 100. Order direct from your RCA Radiotron Distributor or from Camden, N. J., if order is accompanied by remittance,



# RCA PARTS DISTRIBUTORS NOW IN FORTY-FOUR STATES

## Over 200 Distributors Equipped to Give Service Engineers Prompt Service on All Needs

You may now obtain your genuine RCA parts through over 200 Authorized RCA Parts Distributors, located in forty-five states and the District of Columbia. These distributors are conveniently located in all large cities and are anxious to help Service Engineers with their many problems. If you are not acquainted with your RCA Parts Distributor, find out where he is from the following list and give him a call the next time you need a part.

**Alabama**  
Auto Service Company, 1920 Fourth Ave., S., Birmingham.  
The Modern Home Appliance Co., 15 S. 20th Street, Birmingham.  
Moore-Handley Hdwe. Co., 20 So. 20th Street, Birmingham.  
McGowan-Lyons Hdwe., Mobile.  
Teague Hdwe. Co., Montgomery.

**Arkansas**  
Beem Radio Co., Little Rock.  
Gunn Distributing Co., 417 W. Capitol St., Little Rock.  
Wise Radio Supply Co., Ft. Smith.

**Arizona**  
Nielsen Radio Supply Co., 621 N. Central Ave., Phoenix.

**California**  
Automotive Service, Inc., 958 Van Ness St., San Francisco.  
Braun Corp., 2260 E. 15th St., Los Angeles.  
Coast Radio Co., 266 So. 1st St., San Jose.  
Coast Radio Supply Co., 123 10th St., San Francisco.  
I. S. Cohen & Sons, 1025 Market St., San Francisco.  
B. F. DeJarnett Whse. Radio Parts, 2501 Tullare St., Fresno.  
Electric Supply Dist. Co., 435 2nd St., San Diego.  
Leo J. Meyberg Co., Inc., 335 W. Washington Blvd., Los Angeles.  
Leo J. Meyberg Co., Inc., 70 Tenth Street, San Francisco.  
Motor Rim & Wheel Service, 1367 S. Flower St., Los Angeles.  
Radio Supply, 912 S. Broadway, Los Angeles.  
Radio Television Supply Co., 1701 S. Grand St., Los Angeles.  
San Francisco Radio Exchange, 1284 Market St., San Francisco.  
Wenger Co., 1020 Oak St., Oakland.  
Wholesale Radio & Elect. Supply Co., 140 9th Street, San Francisco.  
Braun-Knecht-Heimann Co., 584 Mission St., San Francisco.

**Colorado**  
Auto Equipment Co., Denver.  
Hendrie & Bolthoff Mfg. & Sup. Co., 1635 17th St., Denver.  
Inter State Radio & Supply Co., 1639 Tremont Pl., Denver.

**Connecticut**  
Thomas H. Brown, New Haven.  
D'Elia Elect. Co., 1330 Fairfield Ave., Bridgeport.  
Harty & Young, Inc., 203 Ann Street, Hartford.  
Mac's Radio Service & Lab., 200 Bank Street, Waterbury.  
The Post & Lester Co., 10 Chestnut St., Hartford.

**Delaware**  
F. R. Gooding Co., Fifth & French Sts., Wilmington.

**Florida**  
Electric Supply Co., 121 S. Franklin St., Tampa.  
Glover Weiss Co., 2 E. Bay St., Jacksonville.  
Pan-American Radio, Inc., 1805 N.E. Second St., Miami.  
Thurow Radio Distributors, 100 E. Case St., Tampa.  
Southern Hdwe. & Bicycle Co., 2336 Liberty St., Jacksonville.

**Georgia**  
Atlanta Phonograph Co., 27 Pryor St., S. W., Atlanta.  
Dixie Radio Distributors, Inc., 144 Walton St., N. W., Atlanta.  
A. S. Hatcher Co., 598 Third St., Macon.  
Radio Repair Service, 2405 Bull Street, Savannah.  
Radio Sales & Service Co., Columbus.  
L. J. Schaul, Jr., Augusta.  
Polk Musical Supply Co., 29 Pryor St., N. E., Atlanta.  
Wholesale Radio Service, Inc., 430 W. Peachtree St., Atlanta.

**Illinois**  
Allied Radio Corp., 833 W. Jackson Blvd., Chicago.  
Walter C. Braun, Inc., 601 W. Randolph St., Chicago.  
Central Scientific Co., 460 E. Oliver St., Chicago.  
Englewood Electrical Supply Co., 5801 S. Halstead Ave., Chicago.  
Klaus Radio & Elec. Co., 707 Main Street, Peoria.  
F. B. Lofgren Co., 1631 5th St., Moline.  
Midwest Radio Mart, 520 S. State St., Chicago.  
Newark Electric Co., 226 W. Madison St., Chicago.  
Radio Manufacturing Engineers, Peoria.  
RCA Victor Dist. Corp., 111 N. Canal St., Chicago.  
Sears, Roebuck & Co., W. Arthington & S. Homan Sts., Chicago.  
Schafer & Bowman, 7647-49 S. Wabash Ave., Chicago.

A. W. Sikking Co., Springfield.  
C. N. Stoelling, 424 N. Homan St., Chicago.  
Triangle Elec. Co., 600 W. Adams St., Chicago.  
Montgomery Ward, Chicago

**Indiana**  
Advance Elec. Co., 945 Mulberry St., Terre Haute.  
Smith Distributing Co., Inc., 15 N. Main St., Evansville.  
State Distributing Company, 316 N. Illinois St., Indianapolis.

**Iowa**  
Brown-Camp Hdwe Co., 1st & Elm St., Des Moines.  
Hieb Distributing Co., 908 Walnut St., Des Moines.  
Iowa Radio Corp., 1212 Grand Ave., Des Moines.  
Klaus Radio & Elec. Co., Inc., Davenport.  
Knapp & Spencer, Sioux City.  
Warren Elec. Co., Sioux City.

**Kansas**  
W. A. L. Thompson, Topeka.  
Graybar Electric Co., 323 S. Wichita St., Wichita.  
Lyons & Wyatt, 330 S. Broadway, Wichita.

**Kentucky**  
P. I. Burks & Co., 911 W. Broadway, Louisville.  
Smith Distributing Co., Inc., 831 E. Broadway, Louisville.  
Universal Radio Supply Co., 715 S. 7th Street, Louisville.

**Louisiana**  
Interstate Electric Co., 300 Spring St., Shreveport.  
Shuler Supply Co., 1700 Poydras St., New Orleans.  
Phillip Werlein, Ltd., 605 Canal St., New Orleans.

**Maine**  
James Bailey Co., 264 Middle St., Portland.  
Bartlett Radio Co., 620 Congress St., Portland.  
Parker's, 33 Cony St., Augusta.

**Maryland**  
Mattson's, 631-35 W. North Ave., Baltimore.  
Radio Elec. Service Co., 303 W. Baltimore St., Baltimore.  
Southern Wholesalers, Inc., 1511 Guilford Ave., Baltimore.  
Zimmerman Wholesalers, 114 E. Washington St., Hagerstown.

**Massachusetts**  
C. E. Beckman Co., 11-35 Commercial St., New Bedford.  
Capitol City Dist. Co., 364 Worthington St., Springfield.  
T. F. Cushing, 349 Worthington St., Springfield.  
Eastern Radio Co., 88 Pearl St., Boston.  
H. Jappe Co., 46 Cornhill, Boston.  
H. Jappe Co., 37 Mechanic St., Worcester.  
Saeger Elect. Supply Co., 201 Congress St., Boston.  
Woodrow Radio, Cambridge.

**Michigan**  
Budd Radio Co., 318 So. Washington St., Lansing.  
L. J. Chapman Co., Plainwell.  
Delta Hardware Co., 400 Ludington St., Escanaba.  
Radio Distributing Co., 129 Seiden Ave., Detroit.  
Radio Distributing Co., 235 Market St., S. W., Grand Rapids.  
Radio Specialties Co., 171 E. Jefferson Ave., Detroit.  
Reno Radio Co., 1314 Broadway, Detroit.  
Serlin Stores, Inc., 1419 Broadway, Detroit.  
Shand Radio Specialties, 203 W. Kearsley St., Flint.

**Minnesota**  
The Belmont Corp., 424 6th St., Minneapolis.  
Lew Bonn Co., 2484 University Ave., St. Paul.  
Jalisco Mfg. Co., 1215 Nicolet Ave., Minneapolis.  
Kelley-Howe-Thompson Co., 3095 5th St., W., Duluth.  
Lucker Sales Co., 601-08 N. First Ave., Minneapolis.

**Missouri**  
Aeolian Co. of Missouri, 1004 Olive St., St. Louis.  
Burstein Applebee Co., 1012 McGee St., Kansas City.  
Eshelman Music House, 117 N. 6th St., St. Joseph.  
Graybar Electric Co., 1644 Baltimore St., Kansas City.  
Jenkins Music Co., 1217 Walnut St., Kansas City.  
Modern Radio Co., Hannibal.  
Ozark Motor & Supply Co., 308 S. Jefferson St., Springfield.

Radio Laboratories, 1511 Walnut St., Kansas City.  
Suedekum & Sons, Cape Girardeau.  
Van Sickle Radio, 28 Tenth St., St. Louis.  
Walter Ashe Radio Co., 1100 Pine St., St. Louis.

**Montana**  
Pioneer Radio & Refrig. Service, Butte.

**Nebraska**  
Hicks Radio Co., 1422 "O" St., Lincoln.  
Radio Accessories Co., 2855 Farnam St., Omaha.  
R. S. Proudfit Co., 720 "O" Street, Lincoln.  
R. S. Proudfit Co., Omaha.  
Krich Radisco, Inc., 558 Broad St., Newark.

**New Hampshire**  
Radio Service Lab., 1008 Elm Street, Manchester.  
John B. Varick Co., Manchester.

**New Jersey**  
J. Harry Hearnen Co., Front & Warren Sts., Trenton.  
Krich Radisco, Inc., 558 Broad St., Newark.  
Radio Electric Service Co., 811 Federal St., Camden.

**New Mexico**  
J. Korber & Co., 111 W. Copper St., Albuquerque.

**New York**  
Air Associates, Inc., Roosevelt Field, Garden City, L. I.  
Barker, Rose & Kimball, 511 Baldwin St., Elmira.  
Bruno-New York, Inc., 460 W. 34th St., New York.  
Capitol City Distributing Co., 1039 Broadway, Albany.  
Chanrose Radio, 170-12 Jamaica Ave., Jamaica.  
Chapin-Owen Co., 205 St. Paul St., Rochester.  
Dymac Radio, 216 E. Genesee St., Buffalo.  
Fort Orange Radio Dist. Corp., 356 Broadway, Albany.  
Langdon & Hughes Elec. Co., 1020 W. Genesee St., Syracuse.  
Mac-Radio Co., 50 E. 3rd St., Mt. Vernon.  
W. R. McLaughlin, 254 Broadway, Troy.  
Onondaga Auto Supply Co., 351-353 Onondaga St., Syracuse.  
Onondaga Auto Supply Co., 249 State St., Watertown.  
RCA Victor Dist. Corp., 769 Main St., Buffalo.  
Reading Electric Co., Inc., 24-32 Frankfort St., New York.  
Sanford Samuel Corp., 136 Cortlandt St., New York.  
J. Strauss, 25 High St., Buffalo.  
Wholesale Radio Service Co., 100 6th Ave., New York.

**North Carolina**  
Carolina Wholesale Radio Co., 308 N. Greene St., Greensboro.  
Christian-Harvard Furn. Co., 118 Parrish St., Durham.  
Freck Radio & Supply, Asheville.  
Lewis Sporting Goods Co., 112 W. Hargett St., Raleigh.  
Radio Supply Co., 218 W. 4th St., Charlotte.  
Southern Radio Corp., 208 S. Tryon St., Charlotte.

**North Dakota**  
Dakota Electric Supply Co., 123 Broadway, Fargo.  
Quanrud, Brink & Heinbold, Bismarck.

**Ohio**  
Aitken Radio Corp., 1014 Madison Ave., Toledo.  
Baumgardner Dist. Co., 1015 Jefferson St., Toledo.  
Bell Radio Parts Co., 61 E. Goodale St., Columbus.  
Brighton Sporting Goods Corp. (The Sun Radio Co.), 110 E. Market St., Akron.  
Burns Radio Co., 140 E. Third St., Dayton.  
Cleveland Dist. Co., 1301 Superior Ave., N. E., Cleveland.  
Copp Radio Laboratories, Stratford at Monument Ave., Dayton.  
Dine-Dewees Co., Canton.  
Goldhamer, Inc., 610 Huron St., Cleveland.

*The Sign of Confidence*



**AUTHORIZED DISTRIBUTOR**  
**REPLACEMENT PARTS**  
*Service Equipment*

Look for this sign when you want the finest in replacement parts or test equipment. Distributors displaying the "Authorized Distributor Sign" of the RCA Parts Division have been chosen for their ability to serve you well. They maintain a large stock of the parts you need and are prepared to offer helpful advice on the most difficult problems. The list on this page shows the RCA Parts Distributor nearest you.

The Hughes-Peters Electric Corp., 178 N. Third St., Columbus.  
Johnson Elec. Supply Co., 329 Main Street, Cincinnati.  
Mooch Electric Co., Akron.  
Mooch Electric Supply Co., 504 Cleveland Ave., N. W., Canton.  
Mooch Electric Supply Co., Youngstown.  
Northern Ohio Laboratories, 2073 W. 85th St., Cleveland.  
Pixley Electric Supply Co., 129 E. Chestnut St., Columbus.  
The Progress Elec. Co., 6207-09 Broadway, Cleveland.  
Radio Servicemen's Supply Co., 628 Prospect Ave., Cleveland.  
Ross Radio Co., 325 W. Federal St., Youngstown.  
Rowlands-Halleck Co., 1018 Lima Trust Bldg., Lima.  
Schuster Elec. Co., 2169 Spring Grove Ave., Cincinnati.  
The Standard Supply Co., Portsmouth.  
Thompson Battery & Radio Service, 393 W. Main Street, Zanesville.

**Oklahoma**  
Hales-Mullaly, Inc., 1-7 N. E. 6th St., Oklahoma City.  
Radio, Inc., Tulsa.

**Oregon**  
Harper-Meggee, Inc., Portland.  
Stubbs Electric Co., 33 N. W. Park Ave., Portland.

**Pennsylvania**  
Cambria Equipment Co., 12 Iron St., Johnstown.  
Cameradio Co., 603 Grant Ave., Pittsburgh.  
Consolidated Radio Corp., 612 Arch Street, Philadelphia.  
James B. Duncombe, 1011 W. 8th St., Erie.  
Hamburg Bros., 963 Liberty Ave., Pittsburgh.  
Herbach & Rademan, Inc., 438 Market St., Philadelphia.  
Hollenback Radio Supplies, 2221 8th Ave., Altoona.  
Radio Center Appliance Co., 35 N. 9th Street, Reading.  
Radio Distributing Co., 1128 Market St., Harrisburg.  
Radio Elec. Serv. Co. of Penna., Inc., 7th & Arch Streets, Philadelphia.  
Radio Elect. Service, 1024 Hamilton St., Allentown.  
Radio Service Co., 50 Hazle St., Wilkes-Barre.  
Radio Electric Service Co., 3145 N. Broad St., Philadelphia.  
Rapson - Peterson & Shields, New Castle.  
Raymond Rosen & Co., N. W. cor. 31st & Walnut Sts., Philadelphia.  
Tydings Co., 620 Grant St., Pittsburgh.  
Weymann Co., 13th & Arch Sts., Philadelphia.  
Williamsport Radio Supply, 302 Locust Street, Williamsport.

**Rhode Island**  
Ballou, Johnson & Nichols Co., 128-134 Dorrance St., Providence.  
W. H. Edwards & Co., 32 Broadway, Providence.  
Kraus & Co., 89 Broadway, Providence.

**South Carolina**  
R. E. Mehman, Inc., 1438 Main St., Columbia.  
Paynes for Music, Inc., Main at Washington, Greenville.  
Siegling Music House, Inc., 243 King St., Charleston.  
Wallace D. Du Pue, 138 W. Main St., Spartanburg.

**South Dakota**  
Power City Radio Co., Sioux Falls.  
Dakota Radio Service Co., 304 Broadway, Yankton.

**Texas**  
Amarillo Hardware Co., 506 Tyler St., Amarillo.  
Automatic Sales Corp., 325 M & M Bldg., Houston.  
Peaslee Gaulbert, Houston, Texas.  
Southern Equip. Division, A. B. Frank Co., San Antonio.  
Southwestern Music Corp., 517 A. S. Ervay St., Dallas.  
United Appliance Co., Texas & Pacific Whse., Fort Worth.  
W. G. Walz Co., 500 San Francisco St., El Paso.  
Wilkinson Bros., 2503 Commerce St., Dallas.

**Tennessee**  
Bryant & Trimble, 406 Broad St., Chattanooga.  
Radio & Sound Serv., 204 W. Clinch Ave., Knoxville.  
Riechman Crosby Co., 223 S. Front St., Memphis.  
Tennessee Valley Appliances, Inc., 171 Eighth Ave., N., Nashville.  
Tennessee Valley Appliances, Inc., Knoxville.

**Utah**  
Zions Coop. Mercantile Inst., 351 ZCMI Ave., Salt Lake City.  
Felt Radio Co., 150 S. Main St., Salt Lake City.

**Virginia**  
Benjamin T. Crump Co., 1301 Franklin St., Richmond.  
Johnston Gasser Co., Richmond.  
Peterson-Baker Co., 608 Jefferson St., Roanoke.  
Radio Supply Co., 408 Monticello Ave., Norfolk.

**Wisconsin**  
Radio Parts Co., Inc., 332 W. State Street, Milwaukee.  
S. G. Van Loan, 4th & State St., LaCrosse.  
Taylor Elec. Co., 201 E. Washington St., Madison.  
Taylor Elec. Co., 720 N. Jackson St., Milwaukee.  
Wirtz Co., 2532 N. 3rd St., Milwaukee.

**Wyoming**  
Casper Supply Co., 444 S. Center St., Casper.

**West Virginia**  
Hamburg Bros., Wheeling.  
Ott-Helskell Hdwe. Co., Inc., 86 19th St., Wheeling.  
Shumate Radio Service, Bluefield.  
Sound Systems, Inc., Huntington.  
White Electric Co., Clarksburg.

**Washington**  
Harper-Meggee, Inc., Terry & Republican Sts., Seattle.  
Harper-Meggee, Inc., Spokane.  
Seattle Radio Supply, Inc., 2319 Second Ave., Seattle.  
Spokane Radio, 611 First Ave., Spokane.

**Washington—D. C.**  
Capital Radio Wholesalers, Inc., 3167 Mt. Pleasant St., N. W., Washington.  
Southern Wholesalers, Inc., 1519 L Street, N. W., Washington.  
Star Radio, 409 11th St., N. W., Washington.

## South American Service Shop



One of the advantages of owning a radio in Lima, Peru, is the excellent service facilities offered by the RCA Victor distributor, F. W. Castellano y Hno., Casa Central, La Merced 650, Lima. A new RCA 100-watt transmitter is operated by this distributor under the call letters of OAX4F.



# RCA MODULATOR MAKES 600 K. C. ALIGNING EASY

## Eliminates Need for Rocking Tuning Capacitor When Adjusting Trimmers

By W. J. Zaun and T. Y. Flythe  
RCA Service Engineers

Elimination of the difficult and heretofore the only method of aligning the low-frequency oscillator tracking capacitor—rocking the main tuning capacitor—is just one more of the many time-saving features of the RCA Oscillograph.

The method used with the Oscillograph is to rock the r-f signal

frequency (modulate it) instead of rocking the circuit. As this has been one of the most difficult of adjustments in the field, its simplification is a real contribution to the technique of all progressive service engineers.

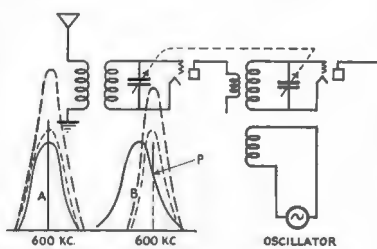
### Reasons for Old Method

Rocking of main tuning control of a radio receiver has always been necessary while making the oscillator low-frequency adjustment, in order to bring the oscillator to the correct frequency when the r-f and first detector circuits are exactly resonant with the incoming signal. This is shown by illustration A, which gives the relations for ideal alignment of a typical RCA Victor receiver. The full-line curve represents the combined resonance curves of the antenna and detector tuned circuits. The dotted curve pictures the i-f system response. The dashed curve is the summation of the i-f tuning and the r-f tuning when the oscillator is 460 kc. (the i-f) above the signal frequency.

### Effect of Detuning

Figure B illustrates the effect of detuning the receiver slightly so that the signal frequency is not on the peak of the r-f resonance curve, but falls in line with point P. By adjusting the heterodyne oscillator

trimmer to the proper frequency (1060 kc.), a peak indication will be observed due to the resonance of the i-f (dotted curve) system; although the r-f (antenna and detector) are somewhat off-resonance. Retuning of the gang condenser would therefore be necessary to bring such circuits into alignment.



Alignment Conditions

But, changing of the gang condenser also changes the oscillator frequency, so that it does not remain aligned. The proper method of adjustment, therefore, requires that the gang condenser be continuously rocked backward and forward while regulating the oscillator trimmer.

### Uses RCA Frequency Modulator

When using the RCA Victor Stock No. 9558 Frequency Modulator in conjunction with the

Cathode Ray Oscillograph for alignment, the rocking operation may be neglected, since the Frequency Modulator automatically sweeps the signal through a range in the same manner as the circuit tuning is swept by rocking of the gang condenser. It is immaterial whether the signal is rocked or the receiver rocked. In the normal set-up for alignment, the low frequency signal (600 kc.) should be tuned in on the receiver, and the Frequency Modulator placed in operation so as to sweep this signal. The image which results on the Cathode Ray Oscillograph will represent the combined resonant characteristics of the antenna, detector and i-f circuits. If the oscillator trimmer is then adjusted until the image has maximum height, exact alignment will be obtained. It is to be observed that changing the position of the gang condensers alters the coincidence of the forward and reverse waves while the adjustment of the oscillator trimmer changes the amplitude (height).

### REMINDER

A small lamp, connected in parallel to your soldering iron, serves as a reminder to turn it off at night, according to S. J. Rosenheim, 828 E. 7th St., Los Angeles, Calif.

# SERVICE NOTES SHOW ALIGNING OF 1936 RADIOS

## Instructions Enables Service Engineer to Duplicate Factory Adjustments

That the RCA Victor Service Notes for the new 1936 RCA Victor receivers are up to their usual high standard is indicated by the complete manner in which the subject of aligning with the Cathode Ray Oscillograph is treated.

This information is given in detail, thereby enabling the service engineer to duplicate the original factory adjustments, even on the most involved receiver. Operations of the Frequency Modulator is also described.

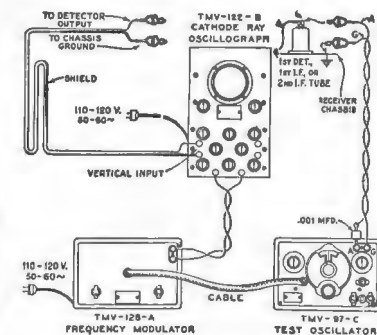


Illustration from Service Notes showing alignment procedure

While there are a number of cathode-ray oscillographs on the market, there has been a dearth of practical instructions for their use in servicing receivers. A study of these RCA Victor Service Notes throws light on many details which previously were obscure to the average service engineer.

Other features of the new RCA Victor Service Notes include diagrams with all values given, voltage charts and complete replacement parts lists.

Service Notes on RCA Victor receivers may be obtained through all RCA Victor Instrument distributors.

# VISITOR PRAISES RADIO SERVICE AS SEEN IN U. S.

## Britisher Is Impressed With Prompt and Efficient Service

A recent visitor to America from England was so impressed by American service facilities that in his report, printed in "The Voice", a house organ of the Gramophone Company, he commented enthusiastically on the excellence of American service facilities. His comments follow:

"The one aspect of American radio which impressed me immensely was the service facilities. Although the regular radio, refrigerator and washing machine dealers have service engineers, naturally the drug store and other shops cannot afford to have their own men. Consequently, in every district there are service companies which exist solely for repairing receivers on behalf of those dealers who have not their own service staff.

### More Meters and More Knowledge

"The radio in my car developed a small fault the night before the relay of the King's Jubilee speech. I stopped at a small town in Pennsylvania. The local radio service man had more meters and more knowledge than any one of his kind I have met before. Although there are probably hundreds of types of different radio sets used in America, I am quite confident this man could have located a fault in any of them. He was not an exception, however, and it appears that radio repairing is as much a service in the U. S. A. as laundering or window-cleaning is here."

# GIVE PRESTIGE TO YOUR WORK USE RCA PARTS AND TEST EQUIPMENT

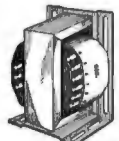
By using RCA Test Equipment you identify yourself as a service engineer of authority and standing. By using RCA Parts in repair work you insure satisfactory performance to your customers and a quality reputation for yourself. Cash in on the RCA trademark by using RCA Parts and Equipment, some of the most useful and popular items of which are shown below.

## RCA UNIVERSAL TRANSFORMERS



### RCA POWER TRANSFORMERS

Four RCA power transformers cover the vast majority of power transformer replacements in radio receivers. Power transformers fit sets from 4 to 12 tubes. Stock No. 9556 (4 tube)—List Price, \$2.06; Stock No. 9553 (5-9 tube)—List Price, \$4.75; Stock No. 9551 (10-12 tube)—List Price, \$6.00; Stock No. 9552 (Class B)—List Price, \$6.50.



### RCA OUTPUT TRANSFORMERS

One open frame and one specially impregnated output transformer cover the majority of output transformer replacements. Both are identical electrically. Fit any output tubes (either single or push-pull) to all cones (1 to 15 ohms). Output Transformer—Stock No. 7852—List Price, \$1.95; Output Transformer (Special Tropical Impregnation)—Stock No. 7855—List Price, \$2.42.

## RCA ANTENNA SYSTEMS

Designed by the world's leading antenna engineers, RCA Antennas give exceptionally fine performance on all wave bands. Through the use of a unique double-tuned system and a transposed lead-in, complete coverage of all short-wave bands is accomplished and noise pickup greatly reduced. Assembled and soldered at the factory to make installation easy. Many thousands of installations of this antenna in all parts of the world have proven its efficiency under all conditions. Recommend it to your customers. You'll never apologize for its performance.



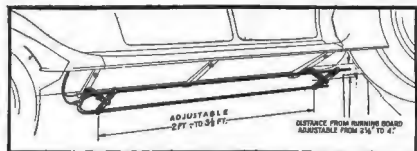
### RCA DE LUXE STORE ANTENNA

All the performance of the De Luxe System plus a special switch for demonstrating up to four receivers in dealers' stores. A necessity for the merchant selling all-wave receivers regardless of their manufacture. Stock No. 9580—Net Price, \$10.80.



### RCA WORLD-WIDE ANTENNA KIT OF ESSENTIAL PARTS

A kit of the essential parts of the standard world-wide antenna system, for dealers, service men and experimenters who desire to furnish their own wire, insulators, etc. Special instruction sheet provided for selecting scientific antenna lengths for special experimental purposes. Stock No. 9550—List Price, \$5.00.



### RCA DI-POLE AUTO ANTENNA

The sensation of the 1935 Auto Radio season. A noise-reducing antenna for all automobiles, easily mounted under either running board. Especially designed for new steel-top cars, not having a roof antenna. Gives an appreciable reduction of ignition noise pickup by antenna. Stock No. 9605—List Price, \$2.60.



### RCA AUTO ROOF ANTENNA

A neat, quickly installed antenna for cars not having antennas installed in roof at factory. Easily installed by pinning to inside fabric of car roof with six safety-type fasteners. Stock No. 7622 (gray cover)—List Price, \$1.50.

## RCA SERVICE TEST EQUIPMENT

Proper servicing of modern receivers is dependent upon professional skill plus proper equipment. RCA Service Equipment enables the service engineer to duplicate factory test methods with consequent improvement in work and reduction in time.



### RCA CATHODE RAY OSCILLOGRAPH

Introduced last year, the RCA Cathode Ray Oscillograph has proven to be one of the greatest aids yet developed for scientific service work. It is also invaluable to dealers for demonstrations and window display purposes. The RCA Cathode Ray Oscillograph is a complete instrument with two power supplies, two amplifiers, internal timing-frequency generator and six tubes, including RCA-906 Cathode Ray Tube. Stock No. 9545—Net Price, \$84.50.



### RCA TEST OSCILLATOR, TMV-97-C

The RCA Test Oscillator is a necessity for all service engineers. It is light (5 lbs.), portable (includes handle), has self-contained power supply (batteries) and covers an extremely wide frequency range (80 kc to 25,000 kc). In conjunction with the RCA Frequency Modulator, it operates perfectly with the RCA Oscillograph for aligning circuits. Other features include modulation switch, external modulation jack, use as a heterodyne frequency meter, extremely low leakage and an easily read, directly calibrated dial. Stock No. 9595—Net Price, \$34.50.



### RCA FREQUENCY MODULATOR

Visual alignment of tuned circuits with the Cathode Ray Oscillograph requires an r-f signal to be swept through the resonant frequency of the circuit under test. The RCA Frequency Modulator in conjunction with a Test Oscillator provides just such a sweep frequency and also generates an a-c synchronizing voltage simultaneously. Stock No. 9558—Net Price, \$27.50.

### RCA VICTOR SERVICE NOTES

Five Bound Volumes of RCA Victor Service Notes include the complete service notes for all RCA, RCA Victor and Victor Talking Machine Company radio receivers manufactured from 1923 to 1935. A necessity for service engineers. Handsomely bound in maroon cloth with gold lettering. Net Price per Volume \$1.00 (P.O.B. Camden, N. J.)



### RCA VICTOR CABINET REFRESHING KIT

A simplified kit, containing all important items for refreshing ordinary scratches and marks on radio cabinets. Contains many items not ordinarily available. Complete in durable leatherette case, opens like a purse. Stock No. 9546—Net Price, \$2.80.



## RCA PARTS AND ACCESSORIES

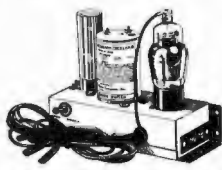
RCA parts and accessories include practically every part a Service Engineer may require for repairing receivers of all types and manufacture. Their quality means ready acceptance by your customers and the RCA trade mark is a prestige builder for you. Use them whenever possible.

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### RCA PARTS CATALOG

A new illustrated 92-page catalog, just issued and containing thousands of parts, is available through all RCA Parts Distributors. Included in the catalog is a complete index of all RCA Victor, G.E., Westinghouse and Graybar receivers together with many diagrams and other special information.



### RCA AUTO RADIO LOCK

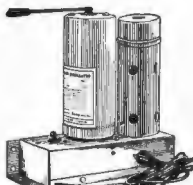
A necessity for every owner of an auto radio. Easily installed, fits all receivers and is as theft-proof as a spare-wheel lock. Lock barrel made by Yale. Use this lock as an extra profit item when doing auto radio work. Stock No. 4375—List Price, \$1.35.

### RCA PHONOGRAPH OSCILLATOR

A simple device for broadcasting records into your radio receiver. Excellent tone quality, easily and quickly installed and works perfectly with all pickups. Uses either 2A7 or 6A7 tube. Includes radio-record switch and special connectors for obtaining power. Stock No. 9554—List Price (less tube), \$7.75.

### RCA BEAT OSCILLATOR

For the amateur who desires to listen to CW code signals with the ordinary short-wave receiver the RCA Beat Oscillator is ideal. Covers range from 415 to 700 kc. Adjustable pitch control. Includes operating switch and connectors for obtaining power from receiver. Uses either 58 or 6D6 tube (not included). Stock No. 9606—Net Price, \$7.50.



### RCA OUTPUT INDICATOR

See your output with this visual output indicator. Impresses your customers and gives quick, accurate indication of the proper alignment point. Consists of a tapped step-up transformer, a potentiometer, a glow tube and necessary binding posts. Stock No. 4317—Net Price, \$4.80.

