



RADIO SERVICE NEWS

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

JULY, 1937

CAMDEN, NEW JERSEY

Vol. 3, No. 34

MAGIC WAVE ANTENNA NOW READY

PUSH-BUTTON TUNING NEW RCA FEATURE

Armchair Control, Overseas Dial, Sonic-Arc are Other Advances

"Push a button, there's your station!" is an advertising slogan that is already becoming familiar to millions of Americans. It refers to but one of the remarkable features of the 1938 line of RCA Victor receivers which was only recently announced but which has already taken the trade by storm. 50% more receivers were ordered at the wholesale distributors' convention in Chicago than were ordered the previous year, reflecting the confidence of RCA Victor distributors that they have a "hot" line.

Real Features, No Gadgets

The strong sales features of the new RCA Victor line will appeal particularly to service engineers since the features are not mere "gadgets" but are actual technical advances. Push-button electric tuning, armchair electric control, a new "Sonic-Arc" type of Magic Voice, and a marvelous new dial on 13- and 16-tube receivers that actually gives 9 full inches of dial space to short wave bands that occupy scarcely one-quarter of an inch on most dials, are some of the outstanding features that will appeal to service engineers.

No Dialing Required

No "dialing" or turning of knobs is involved in the new RCA Victor electric tuning. RCA engineers have evolved true push-button control that is actually fool-proof. The mechanism is uncanny in operation. It will not get out of order even if several buttons are pushed.

Any RCA Victor model with electric tuning can also have "armchair control." The small, neat

(Continued on Page 5, Column 5)

But Don't Go Near the Water!



They didn't want to get their swimming suits wet, so Betty Reller, Patricia Dunlap, and Sunda Love made a canopy of a beach towel when a shower threatened to disrupt their pent house party. All three are popular CBS performers

Plenty of Sales Tools Back New RCA Victor Line

An unusually fine array of sales promotional and advertising material will be available to dealers to tie-in with the great advertising campaign RCA Victor is putting behind their outstanding 1938 line now on the market.

The complete program is de-

(Continued on Page 2, Column 1)

Display Service Available To A Few More Stores

Orders For Famous Displays Now Accepted on While They Last Basis

The opportunity is still open for just a few more quick-acting dealers to benefit from the complete 1937 RCA Radiotron Window Display Service, undoubtedly the finest planned assortment of display material ever offered by a tube manufacturer.

The material is so costly that orders were taken in advance from dealers and no large surplus produced. With only 117 sets of material remaining in the warehouses of RCA Radiotron, orders are now accepted on a "while they last" basis. Since none of the material shipped so far to the earlier subscribers has been of a seasonal nature, dealers who are fortunate enough to get their orders in in time

(Continued on Page 8, Column 1)

Easily-Installed New Aerial Reduces Noise on All Bands

Operates Several Radios At Same Time; May Be "L" Type 20 to 100 Feet Long or Vertical Pipe

Service engineers' prayers for an antenna that was highly efficient and also easy to erect in any location have at last been answered!

Out of their wealth of experience in designing antennas for both commercial and home use, RCA engineers have developed an astounding antenna that reduces noise on both the standard broadcast and the international short-wave bands, operates from a number of radios at the same time and is amazingly easy to install. The new antenna is appropriately named the RCA Magic Wave Antenna and has a list price of only \$6.95 for a single outlet installation.

Two Transformers Used

The complete Magic Wave Antenna System consists of an antenna proper which may be of any practical length, an antenna-to-transmission-line coupling unit, a transmission line and a line-to-set coupling unit. Each of the coupling units has two magnetite core transformers, one responding most efficiently over the standard broadcast band, the other over the short-wave bands.

Factors contributing to noise reduction are low impedance ground connection to the antenna coupling unit, low capacity between transformer windings, balanced capacity of transmission line coupling to windings to ground, and low capacity of primaries to shield in line-to-set couplings.

An advantage of the RCA Magic Wave Antenna that will appeal to service engineers is its adaptability. The antenna may be a single-wire "L" type of any length from 20 to 120 feet, or a vertical signal collector made of several lengths of ordinary iron pipe may be used. It may be installed with equal ease on apartment houses and homes, as a complete new installation or as a connection to an existing antenna.

(Continued on Page 2, Column 4)

DeLuxe Features in New Amateur Receiver 111

16-Tube Instrument Offers Utmost in Performance; Costs Only \$189.50

A truly fine receiver at a price you can afford to pay is the apt description of a handsome new RCA amateur receiver known as the ACR-111 which is now attracting much attention at RCA Amateur equipment distributors. A deluxe instrument with many unusual features, it sells for only \$189.50.

The ACR-111 is a 16-tube super-heterodyne with two tuned r-f stages and a frequency range of 540 to 32,000 kilocycles. It has electrical

(Continued on Page 7, Column 1)

ASK YOUR RADIOTRON DISTRIBUTOR for the plan that puts RCA Radio Tubes on your shelf now—to be paid for later

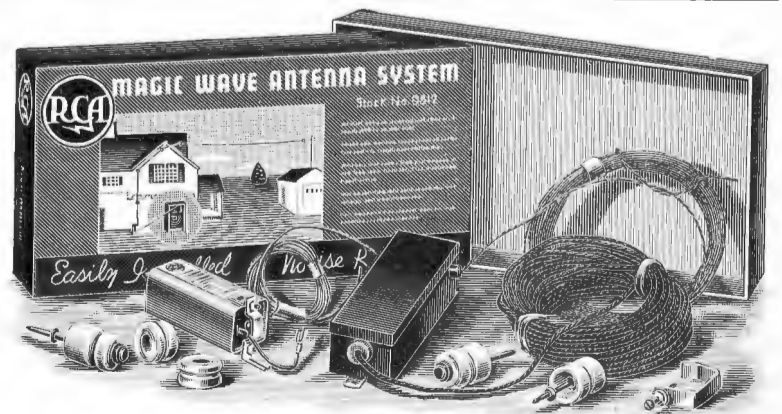
Striking Billboard

DEALER'S IMPRINT GOES HERE



This is the way RCA-Victor's sensational feature, electric tuning, will be brought home to the public over dealers' signatures on thousands of billboards throughout the country.

Versatile! Efficient! Simple!



Outstanding in performance, appearance, and ease of installation is the new RCA Magic Wave Antenna that can be connected to either any ordinary antenna wire or to a vertical signal collector. And the list price is only \$6.95. It will operate as many as 16 radios at one time through the use of additional distribution and receiver coupling transformers.

Tells How To Make Surrealist Window Display

Unconventional New Form of Art Makes Arresting Window Trim

By THOS. J. BERNARD
RCA Advertising Department

Recently the Museum of Modern Art in New York put on an exhibition of Surrealism, that very modern form of art which seems to arouse in the uninitiated a wide range of emotions—all humorous.

To date we have not been able to find anybody who can tell us exactly what it means, but we have seen the effect. In New York the biggest and best known stores ran in "surrealistic" windows, and the papers were full of "surrealistic" ads—even staid old Sloane's ran a screwy ad saying they could do this kind of decoration if called upon, but that the bulk of their business was in supplying fine furniture of the more conventional design.

Surrealism Draws the Crowds

Whatever you may think of Surrealism, it's a great drawing card. People will stop and stare at a surrealist window. This is particularly true of those cities visited by the Surrealist Exhibition, but it is also true of the rest of the country because of the national publicity surrealism has received via the news services, rotogravure sections, magazines and so forth.

Therefore, we give you a suggestion for a Radiotron window in the surrealist manner—with explanations. Have a sign painter make a large-size copy in colors of the illustration shown elsewhere on this page. Two side cards should also be painted, one giving the general story on Surrealism and the other the detailed explanation of the window. Suggestions for this copy are given in the next column.

As for color, let the sign painter use his surrealist judgment, but be sure to give the floating figure a black body and salmon pink face and hands. Make the umbrella black with a red splash on right side, red stick, black handle. The tube is black, roof yellow, brick wall red.

The Radiotron Advertising Department will be glad to hear what success dealers have with their Surrealist window. If enough dealers are interested, another illustration for a Surrealist window will be re-

SJiZoQT . . . Oh, Nerts!



Surrealistic art may not mean anything to you, but it can be used to make a very effective window display. This is one of the now famous RCA Radiotron Check-Up Window Displays

produced in the next issue.
Copy for Card No. 1:

DON'T ASK US . . .

This window may not be a true example of Surrealism but our decorator did his best. All we know are a few general principles, so . . . if after reading the explanation on the other card . . . you still do not understand it, we recommend that you skip the whole thing. Surrealism is sweeping the country. It is, the proponents tell us, a form of art. We present it for what it's worth. If you prefer good, solid, understandable values, stripped of anything remotely connected with the sub-conscious,

STEP INSIDE

Copy for Card No. 2:

WHAT IS IT?

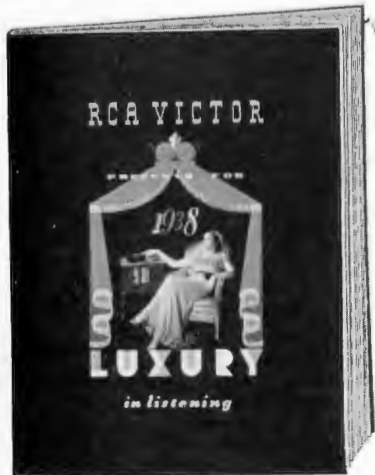
The gentleman with the union suit and florid complexion is the spirit of radio. As to general attitude and disregard of the law of gravity he resembles the Man on the Flying Trapeze. Nor are his supernatural powers thus limited; he is even freer than the air and can penetrate the walls—even though they be made of brick—of our domestic strongholds with the greatest of ease. The umbrella is symbolic of protection. Radios must be protected from the ravages of time and wear, dust and neglect. Once your radio is given a Check-Up (forgive us the taint of commercialism), all is well; with the substitution of strong new RCA Radio Tubes for old worn-out tubes, your radio enjoyment is bolstered against the elements as by a fortress. It can thumb its nose at its enemies. Surrealism is nothing if not honest, but in achieving this supreme virtue, the artist defeated himself. The salmon pink hands and face of the central figure shows that the artist failed of a completely objective viewpoint; he identified himself with the subject, and was embarrassed. The string is another clue to failure. It is a concession to inhibition. At an early age the artist fell head first over a bannister and learned to his lasting grief that you may, perhaps, break the other laws of nature with impunity, but the law of gravity has a way of getting back at you. The red splotch on the umbrella may be interpreted variously, depending on the degree of harmony between the spectator's secret desires and what he ate for dinner.

Plenty of Sales Tools Back New RCA Victor Line

(Continued from Page 1, Column 2)

scribed and illustrated in a large book entitled "The Road to Greater Profits." Distributors' salesmen now have copies of this book and will be glad to go through it with dealers.

"Luxury in everything but price" aptly describes the new RCA Victor line. With this as its theme, a beautifully-printed 48-page book,



page size 11 x 14 inches has been prepared for dealers' counter use. It shows all the models of the line in handsome settings and illustrates all the salient features. It is but one of many new and useful items to make selling easier for the dealer and retail salesman.

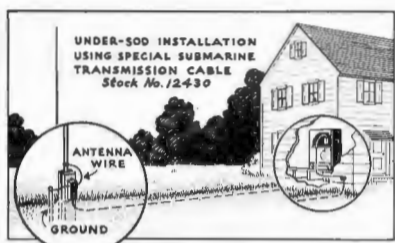
New Antenna Operates Many Radios at Once

(Continued from Page 1, Column 4)

No doublets or transmission line of critical length are required. The transmission line may even be buried in the ground—a desirable feature, especially if a vertical signal collector is used.

Ideal for Radio Stores

The Magic Wave Antenna Kit for single outlet installations includes one antenna coupling unit and one receiver coupling unit. By using a distribution transformer and an additional receiver-coupling transformer for each additional receiver, four receivers may be operated at the same time from one Magic Wave Antenna. With five distribution transformers and 16 receiver-coupling transformers, 16 radios may be operated at the same time from the one antenna, still with only slight reduction in efficiency. Thus the Magic Wave Antenna is an ideal antenna for dealer use.



A vertical signal collector with Magic Wave Antenna Kit

Either a vertical or a horizontal installation of the Magic Wave Antenna gives excellent results on apartment buildings. A screen may be used on the roof as the electrical ground for the antenna-coupling transformer, thus simplifying installation.

Soldered at Factory

Undoubtedly this remarkable new development solves the service engineer's antenna problems and by its ease of installation will enable him to sell more antennas at a greater profit. The public, too, will welcome the Magic Wave Antenna because of its amazing efficiency along with its neat appearance and low price.

The RCA Magic Wave Antenna comes completely assembled and ready to install. For the standard single outlet installation, Stock No. 9812 Kit should be used.

Contents of Kit

- 1 antenna coupling transformer
- 1 receiver coupling transformer
- 60 ft. antenna wire
- 45 ft. transmission line
- 5 ft. ground wire
- 5 porcelain insulators
- 1 ground clamp

Accessories

The following accessories are available for connections to more than one receiver or for under-

Catalog Shows Radiotron Sales Aids; Many Free

Appropriate Direct Mail Pieces, Displays, etc., Easy to Find

RCA has just issued two new publications that will be welcomed by the trade.

To be of still further assistance to thousands service shops and dealers who depend mainly on RCA Radiotron for window displays, sales promotion material, technical information, business forms, etc., RCA Radiotron has prepared a special catalog showing these items. It can be obtained free from RCA Radiotron distributors or direct from RCA Radiotron Advertising



Department, Camden, New Jersey, by asking for RCA Radiotron Sales Promotion Catalog, Form No. 2038.

Many Free Items

Another useful booklet which can be obtained from the same sources is a catalog showing all the RCA Radiotron cuts and ready-made ads for which mats can be furnished. This catalog is Form No. 811.

Almost everything a dealer might need for his selling activities is shown in the sales aids catalog. There are dozens of tested direct mail pieces and sales promotional plans. Two whole pages are devoted to items that are sent free on request. Every dealer or service shop should write for these catalogs and keep them on file.

Stock No.	Description	List Price
9814	Distribution Transformer	\$3.00
9813	Receiver Coupling Transformer	2.50
9816	Magic Wave Transmission Line (not recommended for underground lead-in)—45 ft.	1.50
12429	Submarine Transmission Line (for underground lead-in)—	
	45 ft.	2.00
12430	90 ft.	3.75

Beautiful Setting, Beautiful Sets



Above are shown an assortment of new RCA-Victor receivers that embraces the three types of dials, Sunburst, Straightline, and the remarkable Overseas dial. The back-ground display, available to all RCA-Victor dealers, is a handsome and versatile unit. The three panels can be changed from time to time. Each display is really two displays, since another appropriate picture appears on the back of each panel, which can be reversed in its frame

Hollywood Bound



One of the most beautiful artists on the NBC roster is Florence George, shown above, whose lovely coloratura soprano voice is heard Tuesdays at 7.45 p. m., EDST, over NBC-Blue network. Her beauty and talent have won her a movie contract

Oscillograph Gives Double Image Response

(This technical discussion of the new RCA Oscillator No. 150 is continued from our January issue)

By O. M. OWSLEY
RCA Engineering Department
A brief explanation of double image response of the No. 151 RCA oscillograph follows: Refer to Figure 1 and assume that the cathode ray oscillograph timing axis is locked at 120 cycles, exactly twice the frequency of the pyramid sweep voltage, and that the horizontal deflection progresses from left to right on screen of the cathode ray. In 1/120-second the r-f oscillator frequency progresses from 440 to 480 kc, tracing the response curve on the screen from left to right controlled horizontally by the timing axis oscillator. At the end of 1/120-

corresponding to the alignment frequency. It will be noted that in the Figure 1 the transformer is purposely shown misaligned so that both traces will be fully visible.

A feature of the instrument which should be explained at this point is the variable band sweep. In the explanation and figures of double image response the sweep was referred to as being 40 kc in width (440-480) as this is the maximum sweep. If, when viewing a transformer, this sweep is too great (transformer response is narrow), the sweep can be narrowed to any amount desired by setting sweep control to desired value spreading the transformer response on the cathode-ray oscillograph screen. This change in sweep is effected by changing the amplitude of the pyramid voltage applied to the grid of the frequency control tube by means of the sweep voltage control R-1 which is calibrated in kc sweep. This change in the amount of bias swing changes the gain of this tube, thus controlling the amount of sweep. The variation in nominal frequency setting due to a reduction in sweep from 40 to 5 kc is very small. It is a constant amount

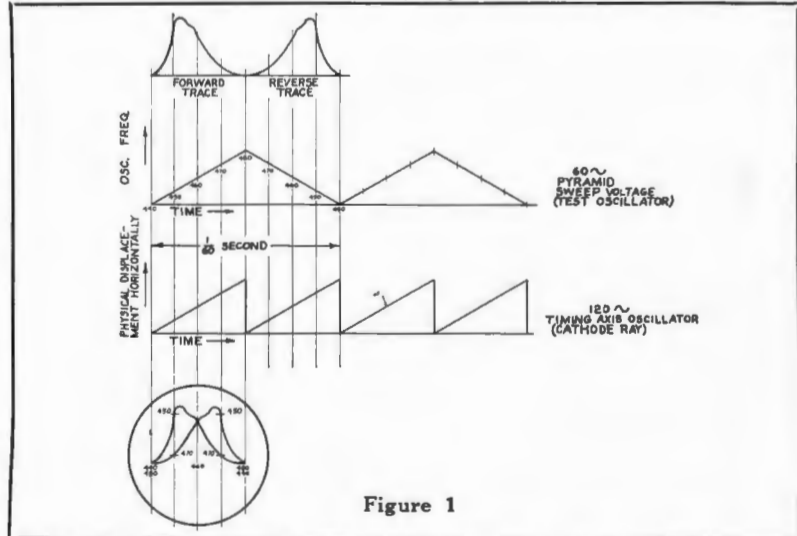


Figure 1

second, the r-f oscillator frequency starts decreasing and during the next 1/120-second changes from 480 to 440 kc. At the reversal point (peak of the pyramid voltage) the cathode ray oscillograph timing axis oscillator has caused the horizontal deflection to reach its maximum on tube screen, its voltage drops to zero and the beam returns to the left side of the screen. The voltage then builds up again, tracing the reverse resonance curve (480-440) of the second half of the sweep cycle, thus giving the two superimposed curves, i.e., being the reverse of each other with respect to frequency except at the point

and at the higher frequencies represents a negligible percentage. At 400 kc it may amount to approximately 1/4 of 1%. If alignment frequency is desired closer than these tolerances it is advisable to calibrate the instrument at the alignment frequency with the sweep adjusted to the desired amount. The amount of sweep for any setting of

1936 SERVICE NOTES

Bound Volumes of all RCA Victor Service Notes for 1936 can now be had at your distributor for only \$1.25 Net.

STILL A BARGAIN

Higher costs have forced an upward revision of prices of two popular RCA Radiotron sales aids, which nevertheless are real bargains even at the new prices. Shipping Label No. 625 is now \$2.00 per 1000 with dealer's imprint. Shipping Label No. 624, is now \$2.15 per 1000 with imprint. No. 625 is a plain label, while No. 624 carries printed instructions to postmaster and space for insurance data. Either label gives a neat appearance to packages and impresses the recipient with the business-like methods of the store.

the sweep control remains constant for all r-f frequencies.

Improved Frequency Modulation
Another feature of the instrument is the absence of amplitude modulation when frequency modulation is employed. Amplitude modulation takes place, to some extent, in all test oscillators using rotating condensers, etc., as means of frequency modulation. This amplitude modulation cannot be checked by simply rotating the condenser by hand and measuring the output voltage as it occurs due to the rate of change of frequency (dynamic characteristic of circuit). It can only be found by comparing the visual picture with the alignment curve taken with laboratory curve drawing equipment. This amplitude modulation (output less at one end of sweep band than other) causes a properly aligned circuit to appear misaligned when viewed on the oscillograph. When frequency modulation is accomplished electronically it is possible to overcome this defect by the proper compensating networks (See May issue) so that resonance curve as viewed on the oscillograph screen is an exact duplicate of one drawn by point to point test methods or one drawn by laboratory curve drawing equipment. Misalignment due to amplitude modulation as it occurs in the older systems of frequency modulation is quite noticeable in the older type of radio receivers using peaked i-f transformers and is extremely so in the newer type flat topped i-f transformers. This misalignment may cause serious receiver interference from adjacent channel transmitters. It should be pointed out here that it is almost impossible to compensate an oscillator over a wide frequency range (90-32,000 kc) for pure frequency modulation. Since the absence of amplitude modulation is such an important qualification the unit was developed on the beat frequency principle with frequency modulation taking place at a fixed frequency, 800 kc. When this 800 kc oscillator is properly compensated the mixed output, regardless of frequency, will be free from amplitude modulation.

Applications
The No. 150 Oscillator is equally as useful for R.F. visual alignment and checking of receiver oscillator tracking as it is for I.F. work. In fact, it is a decided advantage over the meter method. The constant k.c. sweep regardless of r-f frequency offers advantages over many of the older type methods.

Ready-Made Ads



If you want real help with your Check-Up and RCA Radiotron advertising, ask your distributor or write direct to the RCA Radiotron Advertising Department, Camden, New Jersey, for this catalog showing the cuts and ready-made ad mats that are available

F. B. Ostman and E. C. Cahill Are Given New Jobs
Cahill is Now Service Manager; Ostman Joins Sales Department



E. C. Cahill

Two promotions that are of particular interest to service engineers recently took place in the big RCA family. F. B. Ostman, who made thousands of friends in the service industry as manager of the RCA Service Division and whose constructive editorials in RCA Radio Service News have been widely praised, was recently appointed District Manager in Dallas. Ostman is succeeded as National Service Manager by E. C. Cahill, formerly Assistant National Service Manager. Cahill brings a splendid background of experience to his present position. Holding a degree in Electrical Engineering, he joined

RCA in 1928. Since then he has served in various capacities in the Service Department and has acquired a thorough understanding of the problems of service and service men.

High Fidelity P. A. Speakers Now Available

New Speaker Has Many Uses in Radio Stations, Hotels, Schools

A new RCA High Fidelity Console Loudspeaker has been developed to meet the exacting demands of the large broadcasting stations and certain sound amplifying installations for a truly high fidelity monitor speaker. It is ideal for music rooms and for classes in music appreciation, and hotel lobbies, where quality of reproduction is a factor of prime importance.



High-Fidelity Speaker

The cabinet has been designed and styled to meet the most exacting requirements of the modern trend in design. Receptacles are provided for supplying either AC or field to the unit, and also for audio input. The housing is completely enclosed.

Specifications

The speaker may be purchased alone or installed in the specially designed cabinet. Specifications are as follows:
Frequency Response—Substantially Flat 60 to 10,000 cycles.
Speaker Voice Coil Impedance—15 ohms.
Maximum Watts Input—10 watts.
Cabinet Dimensions—33 3/8" high, 28 1/4" wide, 16 1/2" deep.
Speaker Dimensions—Face 8" x 8", depth 7".
Cabinet Finish—Black with Aluminum Trimming.

Silas Egglemud, Ladies Man



"So she's coming around some evening to see my oscillator"

Mr. Egglemud's Boss



"No, Mrs. Doak, you couldn't possibly take the automatic volume control off and attach it to the baby"

NEW RCA ELECTRIC TUNING UNLIKE ALL PREVIOUS TYPES

Momentary Pressure on Button Operates Device; Owner Can Set It For Stations

By W. E. Newman
RCA Engineering Department

Electric tuning mechanisms of the past have been called "Remote Controls" and "Automatic Tuners," and have been used on radio receivers for tuning in stations without the necessity of turning the tuning knob. In the mechanical type the tuning was accomplished by operating a lever for rotating the tuning element to a predetermined setting; in the electrical type a motor was used for rotating the tuning element. In the latter the tuning is effected by holding the push button depressed until the station selected is tuned in.

After analyzing the inherent disadvantages of the various types that have been marketed, an entirely new design that would be a radical departure from existing designs was developed by RCA to overcome the disadvantages of the automatic tuners previously marketed. In developing the RCA tuner the idea in mind was to design an improved and simplified tuner of the motor driven type that obviated the necessity of holding a button depressed until the desired station was tuned in.

Tunes Eight Stations

The RCA tuner is designed for tuning in eight pre-selected stations, that may be tuned in by simply pushing a button for the station desired. These buttons are conveniently located on the front escutcheon of the tuning dial. A novel feature in this push button design is that they are interlocking which makes it unnecessary to hold the button for a particular station depressed until the station is tuned in by the tuning motor. All the parts for this push button assembly are made of stampings which are cheaper to manufacture and run more uniform in quantity production than parts such as plungers, sleeves and bushings made in screw machines which would be the alternative method of making the parts. Further, the construction used eliminates sliding bearings which give less trouble in service than plungers with sliding bearings that have to be held to closer tolerances.

Unit Assembly

The selector mechanism is a unit assembly mounted at three points on the rear end plate of the variable condenser. The shaft of this unit is coupled to the variable condenser shaft through a flexible coupling. The reason for mounting this unit at three points and through the flexible coupling is to avoid setting up strains in the condenser

structure that would cause deviation in the condenser calibration. It will be noted that the selector rotor consists of eight independently adjustable clutch assemblies made up of stacking washers and spacers on a shaft. Each of the adjustable clutch rings have a key slot at the periphery and directly opposite this slot is an insulator for breaking the motor circuit at a contact brush. There are eight contact brushes wired to their respective push buttons at the front of the receiver. At the rear of the selector unit is mounted a toggle switch for reversing the motor and condenser rotation at either extreme end of the condenser rotation. This switching arrangement has simplified the design of the selector mechanism since it has reduced the number of contact brushes at each of the selector rings.

Simplified Construction

Some of the automatic tuners previously marketed had as many as three contact brushes per selector or a total of twenty-four for an eight station selector, whereas in this new RCA device there are a total of only eight. In quantity production this represents an appreciable saving in time required in adjusting the contacts. At the top of the selector is a row of holes for a key for setting up stations. By inserting the key provided, in any one of the holes so it registers with the key slot on the periphery of its respective clutch ring it is possible to lock the clutch ring in position so that it will not turn when the condenser rotor is rotated. This enables the setting or logging of stations anywhere within the rotatable range of the condenser. The stations may be logged close together with this arrangement since the clutch rings are independent of one another, and when one is adjusted the other clutch ring settings are not disturbed. The best procedure for setting up or logging stations is: First, set the AFC Control at the front of the receiver on "Electric" position, then push the push button on which it is desired to set up a station. This will electrically cause the selector to stop with the key slot in the clutch ring in alignment with the key hole in the frame of the selector unit. Then insert the key in the hole corresponding to the push button and rotate the tuning knob to the station to be set up or logged. And after the station is tuned in accurately by visual

observation of the magic tuning eye, then remove the key from engagement with the clutch ring and proceed with setting up the remaining stations in a similar manner.

Easy to Set

This procedure of setting up stations is very simple for the user of the receiver and he should not experience any trouble, nor is there any danger of damaging the mechanism should he fail to remove the key and turn the AFC Control into "Electric" position and start tuning in stations by pushing in buttons. However, should this happen he would lose the setting for the station on the selector that had the key inserted, but, would not disturb the settings of the other stations that may have been set up. Should this happen it would only be necessary to turn the AFC Control to "Manual" position and reset that particular station again. After the eight stations are set up on the selector then the key should be replaced in the rubber grommet on the top of the selector frame and the receiver is then ready for Electric Tuning providing the AFC Control is rotated to the "Electric" position.

Motor of Special Design

The tuning motor is mounted on top of the variable condenser for the purpose of facilitating assembly and adjusting in production. This motor was especially developed for this application and is of the shaded pole type, but reversible. The rotor of this motor is provided with longitudinal motion for two reasons: First, to operate the AFC and amplification suppression switches at the front end of the motor, and second, to provide disengagement of the motor from the driving mechanism to the tuning condenser when the motor is de-energized. It will be noted that the motor engages with the drive mechanism through a pin and arm coupling. The reason for this is to provide a quick coupling and disengagement. This coupling also makes it unnecessary to maintain perfect alignment of the motor shaft and the driven pinion on the condenser end plate which is very desirable should it be necessary to make a replacement in the field.

GLOWING SIGN IN TUBE MAKES GOOD DISPLAY

Novel "Neon" Bulb Can Also Be Used As Night Sign



from RCA Radiotron distributors.

For Windows or Interiors

Many uses for the Glow Tube will suggest themselves to stores that realize the effect of novelty in window or interior displays. Several of the tubes might be screwed into sockets to outline a window, or with a little ingenuity special display pieces can be rigged up using the tube. In the store, one or more tubes could well be used to mark the RCA Tube department.

Low Current Drain

Since the tube consumes less than two watts it makes an ideal night lamp.

A special registration feature makes it possible to have the letters "RCA" face in any direction when the lamp is in a socket.

For scarcely more than the price of an ordinary lamp, dealers can now get a novel display piece that has great attention-getting value. The letters "RCA" inside the bulb shown here have a "neon" glow when the bulb is screwed into either an A-C or D-C 110-volt outlet. The price of the RCA Glow Tube is only 60c. It can be obtained

SHOP NOTES

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

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

Parts Identification

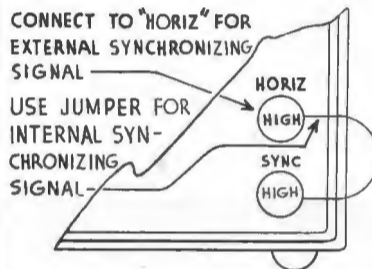
The numerals stamped on various parts of RCA receiver assemblies are for manufacturing use only and should not be interpreted as stock or catalogue numbers. Always order replacement parts by the Stock Numbers supplied in service lists, and in the event this number is unavailable, order by careful description of the part desired, including the factory markings.

84BT6 Tube Complement

Some receivers of this type employ a '42 output tube. Present specifications call for an RCA-41 in the output stage, and it is recommended that this tube be used for replacement on all receivers. The '41 fits the '42 socket, no circuit changes are necessary, and performance does not change. Battery drain changes to 2.65 amperes.

Synchronizing Control—Model 151 C-R Oscillograph

Unless proper connections are made at the "HORIZ-SYNC" terminals, it will be impossible to lock-in the synchronizing signal or to control it correctly. The terminal marked "HORIZ" is the input to the horizontal amplifier, and the "SYNC" terminal is used for connection purposes only in order to employ internal synchronization.



When external synchronization is to be used, attach the source of the signal to "HORIZ" and "O" terminals of the oscillograph, and turn the Amp.-H switch to "Timing." For internal synchronization, a jumper lead such as shown above should be connected between "HORIZ" and "SYNC," and the Amp.-H switch placed in the "Timing" position.

Defies Heat Waves



Virginia Verrill, comely CBS singing star, takes refuge from the heat in an indoor pool when her studio engagements prevent her getting away to the shore during the summer

Motorboating—Models 13K and 15K

Low frequency oscillation or motorboating with resultant audio distortion may occasionally be due to an open joint in the 10 x 10 mfd. Stock #13025 capacitor used as by-pass for the audio and driver stage cathodes. The condition may be either continuous or intermittent.

Model 5T7-O

This instrument has a chassis and speaker identical with those of Model 5T7. The cabinet finish is plain maple instead of blonde maple as on the 5T7. All electrical and mechanical service data of 5T7 are directly applicable to 5T7-O.

Repairing Pickup Unit

If inspection or tests indicate that a pickup of the type employed on Models 9U, 9U2, D22, etc., is unstable due to loose solder at the point where the centering spring is attached to the armature, careful repair should be effected as follows:

- (1) Remove armature from pickup assembly and thoroughly clean parts to be soldered.
- (2) Obtain a soldering iron of approximately 100-watt capacity; adjust or modify it so that the point is short and stubby in order to concentrate the heat.
- (3) Apply an acid flux to the junction of spring and armature, and solder as hurriedly as possible to prevent the heat from spreading. Solder consisting of 50% tin and 50% lead should be used. See that it flows between the spring and the walls of the hole in the armature.

WARNING: This repair requires that a quick, clean, solid joint be made in the minimum of time. Excess heating will affect the resilience of the spring; therefore avoid application of the iron for too long an interval.

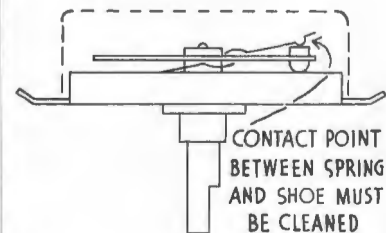
Magic Eye Deflection—C11-1, D11-2 and T11-8

Deflection of the Magic Eye on short wave stations is generally limited by the comparatively low signal strength obtained. The original circuits of these models are arranged so that excessive overlapping does not occur on strong standard wave stations, and, at the same time, some indication is possible on the average weaker short wave stations. Better deflection can, however, be obtained by using an RCA-6G5 tube in place of the 6E5, and making minor circuit alterations as follows:

- (1) Remove 2.2 megohm resistor R-11 from circuit.
- (2) Change value of capacitor C-24 to .025 mfd.
- (3) Re-connect resistor R-10 to the junction of R-9 and R-7 (lug labeled C-21 on chassis wiring diagram) instead of to R-8 and R-7. This connection can be conveniently made at the base of the second I-F transformer.

Volume Control Repair

Many controls of the Stock #11237, #11205 and #5223 types have a construction as shown by the sketch below. Any noise developing on these units can be satisfactorily eliminated by cleaning the contact point between the phosphor bronze spring of the wiper arm and



the monel metal sliding shoe. The cleaning should be done by drawing a strip of crocus cloth or very fine sandpaper through the contact so as to clean both parts. A small amount of very light oil or Vaseline applied to the contact surfaces after cleaning will prevent future corrosion.

Service Tips



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

Noises in 1937 RCA Victor Auto Radios on Display Boards

After installing the 67M, 67M1, 67M3 radios on the triple display board I find that the antennas pick up vibrator noises. By grounding both ends of the antenna shields to a chassis of the display board the noise is eliminated.

D. E. Brummett,
Interstate Electric Co.,
Shreveport, La.

Microphonic Noise in RCA Victor 48

A terrific microphonic noise was encountered in an RCA Victor Model 48. After a new set of tubes effected no improvement, all the component parts were gently tapped to localize the source of the noise. The slightest touch on the power transformer would set the set into a bad microphonic howl.

The two rivets holding the transformer shells to the laminations were next drilled out to permit examination of the coil assembly, and the cause of the disturbance became immediately apparent. The electrostatic shield was soldered to one of the transformer shells and this connection had broken off. The slightest vibration was enough to cause an intermittent contact at this point. Resoldering the joint cleared up the noise entirely.

Sanford Miller,
1827 65th St.,
Brooklyn, N. Y.

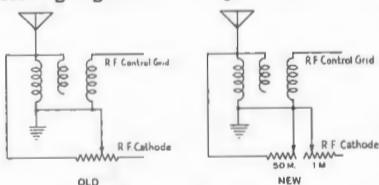
Increasing Selectivity of TRF Sets

When an old set becomes less selective, especially an old TRF set, the best solution of course is to sell a new radio, but when that can not be done and the customer wants to get certain stations, add a little feedback in the second RF stage by twisting a turn of insulated push-back wire between the second and third stage grids and adjust for best results. A small trimmer condenser on the first stage and attached to the panel can be used to best advantage in this case.

Chester Y. Sakura,
Eatonville, Wash.

Gulbransen Model 73 Volume Control

Although there are not many of these sets in the field today, occasionally the serviceman is confronted with the problem of replacing the volume control because it has become noticeably sharp on strong signals. A replacement con-



rol for this set is not easy to acquire. To overcome this difficulty, I installed a dual control (R.C.A. stock no. 10826) as shown in the illustration. After having done this, a smooth and positive control of volume was realized.

E. D. Mattox,
192 Cedar St.,
N. Plainfield, N. J.

Fading Volume Controls

On 1935 models of RCA, Philco and Grunow, fading volume controls need not be discarded. Pull a strand of wire from a piece of flexible hookup wire and solder it from the volume control rotor to the little copper rocker that makes contact to the resistance strip.

Glen Nye
1592 Front St.,
San Diego, Calif.

35 Tubes in Radiola 80

In regard to the tip in the July RCA Radio Service News on installing 35 super control tubes in Radiola 80 sets, I have been using this for some time. However, if the job is done as mentioned, there will be little control on any broadcasting stations located within a few miles. To complete this job, remove the red

and yellow wire going to the 2,000 ohm resistor in the cathode of the 2nd I.F. (at the resistor) and connect the wire to the cathode connection of the first I.F. tube. Install a RCA 35 tube in the 2nd I.F., thus making three in all. It gives perfect control and in many locations would eliminate the need for using the local long distance switch.

Glen Nye,
San Diego Auto Electric,
916 Union Street,
San Diego, Cal.

Sonotone Hook-Up for Magic Voice

For Sonotone hook-up in Magic Voice sets, if Earphone Adapter (9715) is mounted on left side of cabinet (facing cabinet) drill hole through chassis shelf close to left side of cabinet to admit lead cord to speaker. If mounted on right side use hole already drilled for speaker leads to chassis.

Do not drill through Magic Voice back, since it would interfere with removal of back and possibly tear leads loose when back is removed.

J. W. Schoof.

Crosley Model 127

This set has the peculiarity of playing for a while, then the signals become distorted and finally cut off, and at time will only play on the low frequency end of the dial. The cause of this is the screen grids in the 47 becoming red hot, causing them to sag and short out. The remedy is to replace the 6000-ohm resistor which feeds the screens of these tubes to that of a 10-watt resistor, the original being 1 watt.

R. A. Bromley,
Hamlin, W. Va.

Majestic 90 and 90B

When you have to replace the line ballast resistor in an old Majestic 90, 90B, etc., try rewinding the old form with wire from an old 20-ohm rheostat from a battery set. The wire is just the right size and length. It is also heavier wire than the original and will stand up better.

M. A. Nelms,
625 W. Ocean Ave.,
Long Beach, Calif.

Cleaning Volume Controls

Carbon tetrachloride is the radio serviceman's best friend. It cleans switch points and condenser bearings perfectly and will make a noisy wire-wound volume control as quiet as a new one, which is a fact most radio men know, but believe it or not, it will do the same for a carbon-type volume control.

M. A. Nelms,
625 W. Ocean Ave.,
Long Beach, Calif.

Mercury Rectifier Interference

In the Tips column of March, 1936, RCA Radio Service News, I noticed a tip on curing interference set up by mercury vapor rectifier tubes. A much easier way is to insert an R.F. choke in series with each plate lead and as close to the tube socket as possible. Most any R.F. choke may be used, as the value is not critical. The writer has used 175 K. C. intermediate frequency coils and antenna choke coils, etc., from old junked receivers.

Albert Gifford,
11 William St.,
Auburn, N. Y.

Oil Works Wonders

Many servicemen use light machine oil to lubricate moving parts in radio sets. This practice results in noisy controls, and the set is worse than before. Pure mineral oil, which may be obtained for a few cents in any drug store, works wonders in calming down noisy controls. Keep a small oil can handy, and use it on the end bearings on condenser shafts. Also put a drop of oil to the springs which bear against the shaft. Some variable condensers have several of these

springs. Some cases of oscillation can be traced to these springs. Scrape points of contact clean. Oil where they bear against the condenser shaft. Do not oil the pointed ends of these springs.

The wheels on dial cables should be oiled. Be careful the oil does not contact the cable or slot on which cable runs, otherwise a slipping dial will result.

Put a drop of oil on the lock washer (not really a lock washer but very similar in appearance to one), which is located on the shaft of most volume controls.

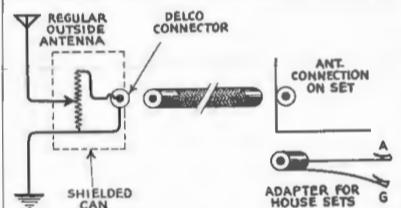
Many times a noisy volume control, especially of the carbon variety, may be made noiseless by applying mineral oil. A very high grade mineral oil is sold under the name Nujol.

Harry Farber,
213 Monroe St.,
Syracuse, N. Y.

Testing Potentiometer

I am submitting the following 'kink' which I have used for some years in my shop and hope you can use it on your 'Service Tips' page.

In order to facilitate the testing of auto sets as well as the comparison and testing of house sets for sensitivity, I use a potentiometer in the antenna connection of my test board in connection with a five-foot low capacity shielded cable of the auto radio type. Thus I can reduce the signal input to the set to approximately the same value as the car antenna.



The potentiometer is hooked up 'wrong end to' in order to lessen the 'shorting' effect on the antenna coil of the receiver at low signal settings.

B. F. Kelly,
1616 W. Beauregard,
San Angelo, Texas.

Repairing Shield

I had a set in which the grid lead coming out of the I F shield had been pulled so hard that it had ripped the shield about an inch and a half. The lead was replaced and the set was otherwise O K after re-alignment but that shield with the cut down the side looked terrible. Tin foil was much too bright. However, I found a deluxe wrapping paper in so-called gold and silver finish. The latter is actually a dull aluminum and matched perfectly when affixed with waterproof cement.

Edward J. C. Arnold,
42 W. Fordham Road,
New York, N. Y.

Eliminating Wheel and Body Static

The return of the static from the rear end housing of a car to the car frame is none too good in most automobiles, if the car is greased properly. Therefore, the paint should be removed from the drive shaft housing and a ground strap installed by using a piece of flexible wire from the strap to the frame. Make sure to scrape the paint from the frame connection and then repaint to prevent rust. Remove one stud that fastens the drive shaft housing to the rear end housing and clean paint from under the bolt head. Replace stud and you have a direct ground from the collector in the rear wheel assembly to the frame.

Ernest L. Gibbs
Regional Radio Service Instructor
Chevrolet Motor Company
Stuart Building
Seattle, Washington.

Note: Mr. R. J. Patterson, of Van Nuys, California, has also submitted the same suggestion, but he believes that a brush and holder are better. Editor.

ENGINEER EXPLAINS THEORY OF NEW RCA BAND SPREADER

Overseas Dial of Some 1938 RCA Victor Radios Gives Each Short-Wave Band 50 Times More Dial Space

By J. D. REID
RCA Victor Engineering Dept

Short wave reception in the internationally assigned entertainment bands has become of greater importance to the American listener in the last few months. Signals from the principal European stations are stronger and more consistent due to increase in transmitter power and the use of directive antennas for the North American Continent. Station schedules have also been lengthened and more time is devoted by these stations to programs broadcast in English.

In an ordinary short wave receiver with all wave coverage, the short wave bands are crowded in narrow spaces over the dial which makes correct tuning extremely difficult. The ability to identify a station or to re-tune the receiver to the same station requires considerable practice. The usual short wave scale covers a frequency spread of 5600 kilocycles to 22,000 kilocycles of which less than 5% is required by the six international entertainment bands at 49, 31, 25, 19, 16 and 13 meters. It would be desirable from the standpoint of ease of tuning to spread out these bands to the width of the standard broadcast scale. To accomplish this and still maintain a continuous frequency coverage would require 18 to 20 separate bands of 1000 kilocycles each. Such a design would of course be impractical.

50 Times Further Apart

The new 1938 RCA Receivers incorporate a type of electrical band spread which brings to the customer the four principal short wave entertainment bands with a greater ease of tuning than on the standard broadcast band. Short wave stations are spaced over 50 times further apart on the dial than on former short wave receivers. The principal station names are printed directly on the dial together with their respective megacycle marking. The customer merely turns the dial pointer to the station name and then accurately tunes his receiver by the maximum deflection of the Magic Eye.

Each of these four spread bands is approximately 280 kilocycles in width and occupies a space on the dial about 10" in length. The exact ranges are as follows:

Meter Band	Range in mc.	Width in kc.
49	5.97—6.24	270
31	9.41—9.69	280
25	11.68—11.92	240
19	15.09—15.38	290

The 16 and 13 meter bands are not included on the band-spread scales since these bands are of

lesser importance to listeners in this country. These higher frequencies are only suitable for daylight transmission and reception over very long distances.

A simplified Magic Brain coil structure has been designed for these spread bands. The antenna and radio frequency stages are each fixed tuned in the middle of each band while the oscillator circuit is tuned over the entire band by a split section of the variable condenser. In this manner, higher inductance antenna and R. F. circuits may be used which result in increased gain and greatly improved signal to noise ratio. Both the antenna and R. F. stages use a special tapped coil construction which avoids the cost of separate coils. The R. F. stage has no primary coil and is inserted in the plate circuit of the radio frequency tube.

The oscillator design requires separate coils with a magnetite core inductance adjustment for each coil except on the 49 meter band. Each oscillator circuit is aligned to its

(Continued on Page 8, Column 1)

PUSH-BUTTON TUNING NEW RCA FEATURE

(Continued from Page 1, Column 1)

remote control box is easily connected to the receiver and is just as efficient as the electric control built into the cabinet. True luxury in tuning!

Sharing honors with electric tuning as outstanding sales features of the year is RCA Victor's amazing "overseas" dial found on the 13- and 16-tube models. It makes it even easier to locate a short-wave station than a station in the standard broadcast band. The technical details of this achievement are given in another article of this issue. Other models in the RCA Victor line have beautiful new "Sunburst" and "Straightline" dials, both remarkably attractive and easy to read.

With a long list of other potent sales features in addition to electric tuning, improved dials, and the Sonic-Arc Magic Voice, RCA Victor dealers are enthusiastically planning complete sales campaigns to take full advantage of their favorable market situation.

50 Times Easier to Tune



Here is a close-up of two sensational features of the new RCA-Victor line: electric tuning and the new "overseas" dial. Notice the eight tuning buttons with their station designations and the dial above which gives each short wave band a dial space over nine inches long, makes short-wave tuning 50 times easier

DeLuxe Features in New Amateur Receiver 111

(Continued from Page 1, Column 5)

band spreading in each band except the broadcast band. The dust-proof, eight-inch, full electro-dynamic speaker is mounted on a separate easel.

Resembles Commercial Receivers

In construction and circuit design the ACR-111 closely resembles the finest receivers used in commercial communication work. According to E. C. Hughes, of the RCA Amateur Division, the new receiver must be seen and used to be fully appreciated. Plunger-type air dielectric trimmer capacitors, constant-percentage electrical band-spread, three magnetite-core i-f transformers, delayed and amplified A.V.C. are only a few of a long list of features.

Specifications

Circuit: 16-tube Superheterodyne, two tuned r-f stages, air dielectric trimmer capacitors in high frequency circuits, two 460 kc. magnetite core i-f stages with crystal filter, separate h-f oscillator, A.V.C., noise suppressor, noise limiter, heterodyne oscillator, audio amplifier, push-pull output stage, electron-ray tuning and signal strength indicator, and an integral power supply.

Tubes: 4 RCA 6K7's as r-f and i-f amplifiers; 4 RCA 6J7's as high frequency oscillator, heterodyne oscillator, noise suppressor and first detector; 1 RCA-6H6 second detector; 1 RCA-6R7 A.V.C.; 2 RCA-6C5's as first and second audio amplifiers; 2 RCA-6F6 push-pull out-



Panel-type ACR-111 Receiver

put amplifiers; 1 RCA-6E5 electron-ray tuning and signal-strength indicator; 1 RCA-5Z3 rectifier. All tubes metal except RCA-6E5 and RCA-5Z3.

Dials: Band-selection dial accurately calibrated in megacycles. Separate-aperture calibration spread dial (0-100 degrees). Tuning drive ratio 100 to 1.

Band Changing: By switch from front panel (Rotary type with self-cleaning contacts).

Power Supply: Built-in; Rating A, 50/60 cycles, 105-125 volts; Rating B, 25 cycle, 110-125 volts, available on special order. Rating C, 100/130—140/160—195/250 volts, 40-60 cycles. Primary power consumption 120 watts.

Power Output: 5 watts (undistorted), 8 watts maximum.

Accessories: The ACR-111 is supplied complete with coils, tubes, power supply and speaker. See it at your RCA Amateur distributors or write to Amateur Section, RCA Manufacturing Co., Inc., for Folder No. 2051 describing this splendid new receiver.

New Amateur Receiver



Here is a remarkable new RCA receiver that offers every feature an amateur could want, yet it costs only \$189.50. This price includes coils, power supply, and speaker

The Voice of Radio Service

A forum for members of the radio service industry. Letters of general interest will be published even though the views expressed may not agree with ours

HE-MAN TOOLS

..... I disagree with both you and _____ and the others who are making test apparatus look just too too dainty. Borrowing a friend's _____ with the square meter I was surprised to find people saying such things as "Don't you use a regular tester?" and "Is that an electric clock?" Psychologically people think of the somber round meters as precision scientific instruments and of the fancy ones as toys.

If I were a sales engineer I would have duplicates of the RCA 150 and 151 oscillographs made up in sombre scientific black, relieved with bright red markings and red knobs. Red seems to be associated in people's minds with science too. Incidentally that's the color scheme of your tube cartons and customers seeing the two together would make the desired connection.

Edward J. C. Arnold,
42 W. Fordham Road,
New York, N. Y.

MORE ON DISCOUNTS

The last issue of RCA Radio Service News carried a letter from Mr. Rosekilly of San Francisco regarding the ability of a customer of his to get a discount of 40%. The Editor added a footnote desiring to know where he can get those discounts. Dear Editor: You do not have to go to the Pacific Coast, come to Boston, Mass.

With some earlier experience, I have been 100% radio since 1924. For at least seven years one prominent Boston dealer has handed out discounts promiscuously. No matter who you work for; that entitles you to a discount ranging from 20 to 40%. A party I know wanted a good radio a few years ago and, seeing the dealer's sign, went in. He selected an RCA-Victor Model 280 (check the price of that model) and took out his check book

to pay cash, list price. The salesman asked who he worked for. He had retired from U. S. Customs. He was handed a discount of 30%! _____ is the only radio I know of that can't be purchased at a discount.

Sells Repairs, Not Radios

I have a Radiola 50 in my shop now with a twelve dollar repair job. When the customer learned the charges he wanted to junk the set. He named the concern above mentioned whom he knew would give him 30% but another company would give more. He checked it and told me this morning that he could purchase a \$150.00 RCA-Victor Radio for \$85.00 cash. Where does the retailer fit? I do not try to sell new radios. I talk against it if I can get even a small repair job. Do not think I am picking on RCA. You can purchase _____, _____, and all the rest. Also repair parts.

I won't dare you to print this but I would like to know what the situation is in other parts of the country. If you would like to print it go ahead; strike out names if you wish. Leave mine in.

Raymond C. Wyman,
51 Central Avenue,
Medford, Mass.

ROSEKILLY AGAIN

I received the News today, which is a kind of ominous date [April 1st] for the remark you make at the end of my letter: "Where can we get those discounts." Not taking advantage of the day?

Surely you get an employee's discount of over 40% on company lines, and when it comes to buying other things at discounts surely the good old firm has a friendly purchasing dept. which will buy your needs for you at the same price, or close enough, to what the firm would get it at?

While you may not be able to get 40% off on tires, surely anyone handling your auto sets will give you at least 25%? And possibly you have read the *Readers Digest* article entitled "Only Saps Pay Retail Prices," in which the numerous ways of getting discounts are fully dealt with.

Sorry, but I think you are trying to kid this child.

As regards our chiseling friends about whom I wrote you, after no satisfaction on even the labor on the antenna job, I arranged for a loose wire to flap around by their front window, whereby they kicked to the landlady, who called me, who fixed the wire and cut their lead-in and freed that end of the aerial; then, by a quick trip to the roof, the top part was soon down on the sidewalk in the car, and one chiseler did not get away with too much, after all. *Strangely* enough, I have had no further calls from this party.

Life is at times very strenuous out here among the Indians and the log cabins and the crude settlers.

George Rosekilly,
4037 26th St.,
San Francisco, Cal.

\$49.95 Record Changer Opens New Markets

Low Price and Compactness Make Device Good Service Item

At last there is a high quality automatic record-changing mechanism at a price that opens up a highly profitable market for service shops. Service engineers on the job in homes will see many opportunities for selling the new RCA Record Changer No. 9800 that has a list price of only \$49.95.

The \$49.95 Record Changer will undoubtedly appeal to a large market. This remarkable mechanism, almost fool-proof in its simplicity, plays and automatically changes eight 10-inch records and repeats on the last record, or it will play and repeat 12-inch records when loaded singly.



No. 9800 Record Changer

The dimensions of the unit are such as can be fitted into many old radios and combination instruments: length 13 1/2", depth 10 1/4", height above motor board 4 1/2", underneath depth 3 7/8".

Needles Inserted From Top

For those prospects to whom price is not of paramount interest there is another new RCA Record Changer, No. 9820, which lists at \$99.50.

Record Changer No. 9820 is the same as the automatic mechanism that has been used in RCA Victor de luxe instruments for several years, except that No. 9820 has a new crystal pickup and spring balanced tone-arm. This pick-up is suitable for playing standard, long-playing and transcription type records although No. 9800 is supplied for 78 R.P.M. only. A new feature of this pickup is that it is loaded from the top, the needle automatically adjusting itself to proper playing position. The crystal pickup and arm alone can be obtained as Stock No. 14818, list price \$14.95.

TELLS THEORY OF SONIC-ARC MAGIC VOICE

(Continued from Page 6, Column 3)

capacity C_1 and the effective capacitance of the $C_2 L_2$ circuit. A further study will show that at frequencies above the central dip the currents will have components in the direction shown by the arrows in Figure 1 which, while they appear to be opposite in direction, actually represent the same phase in the acoustic circuit since the current I_2 is at the back of the cone while the cur-

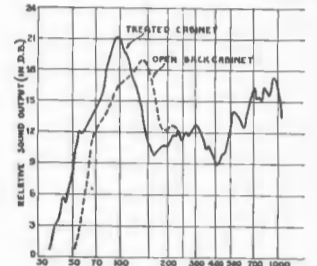


Figure 3

rent I_1 is at its front. In other words, the two currents flow into the capacitor C_2 at the same instant. In the acoustic circuit this means that air is flowing into the openings at the same time as the cone is moving back into the cabinet. Obviously, the sounds created by these motions will add.

A comparison between a cabinet equipped with the new Sonic Arc Magic Voice, and the same cabinet with no treatment (open back and bottom) is given in Figure 3, while

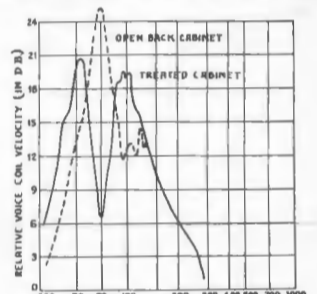


Figure 4

Figure 4 shows the corresponding voice coil velocities. It should be noted that the Magic Voice is operative only in the low frequency range. It has only minor incidental effects at higher frequencies. It should also be noted that the chief effect of the Magic Voice is to increase the low frequency response, and any attempt to demonstrate its performance should be conducted with this fact well in mind.

Creates Extra Sales

ENJOY YOUR RADIO While You Work!

With this RCA Victor EXTENSION SPEAKER

No longer need you miss your favorite radio program because you are busy in the kitchen or upstairs. With an RCA Victor Extension Speaker connected to your present radio you can have music at the flick of a switch wherever you want it—in the kitchen, dining room, sun porch, den or bedroom. Does not affect normal operation of radio. \$9.50 Call us for a free demonstration. Price, only



YOUR IMPRINT HERE

Doubles the pleasure of your Radio

An extension speaker is an item that is easily demonstrated—and sold—by service engineers when in the customer's home. Above is a card that will bring in many an inquiry and costs little. It can be obtained, stamped and imprinted, for only \$1.25 per 100. Order Form No. 1883

Collegiate Radio Star



Both a senior at college and an accomplished radio star is beautiful Mercedes McCambridge, NBC performer who is making a name for herself as a radio actress

A Big One



Want a big oscillograph? Here's a laboratory-type RCA oscillograph with a 9-inch screen that has a net price of \$800.00.

Display Service Available To A Few More Stores

(Continued from Page 1, Column 3) will be able to make full use of the material.

Two Units Now Ready

In August subscribers will receive the Giant Tube Display, in which a gorgeous full size cut-out girl compares a metal tube with a 100,000-watt. The climax of the service is the football display, which is shipped in October. It can be used in many different ways all during the height of the Fall selling season. This display comprises 11 pieces.

The regular price of the Service is only \$2.85, which includes a Pictorial News Service and various special window streamers such as the World Series baseball scoring streamers that are familiar to all dealers and to millions of the public. Orders for the service should be sent without delay to Radiotron distributors or direct to RCA Radiotron Advertising Department, Camden, New Jersey.

Engineer Tells Theory of New Band Spreader

(Continued from Page 5, Column 5) own dial calibration independent of the other bands. The circuit used is a compound Hartley circuit with the cathode connection tapped near the center of the lowest frequency coil and the higher frequency oscillator coils then shunted across this coil without shifting the cathode

tap. An air trimmer is used to align the dial calibration for the 49 meter band since any inductance adjustment of this band would be reflected to the higher frequency oscillator coils.

Each oscillator circuit is tuned by a small variable section of the main variable condenser. The total capacity change of this section is approximately 15 MMF which results in a frequency change in each oscillator of about 280 kilocycles. In order to obtain stability of the oscillator circuit with respect to small changes in capacity caused by vibration and movement of leads, a padding condenser of 100 MMF is connected in shunt with the small tuning condenser on the 49 meter band and left connected for the higher frequency band-spread ranges. To maintain the same width of tuning range, 280 kilocycles, on the higher frequency bands, additional padding condensers are shunted across the oscillator circuits. A total capacity of 200 MMF is required for the 31 meter band and 300 MMF for the 25 and 19 meter bands.

Frequency Drift Precautions

One of the most serious considerations in the design of such a spread band system is frequency drift of the oscillator circuits caused by changes in humidity and temperature. Since each spread band range is calibrated in station names and also in 10 kilocycle divisions spaced over $\frac{1}{4}$ " apart, it becomes of greatest importance that oscillators drift be reduced to a minimum. A change of 1MMF in distributed capacity or an equivalent percentage change in inductance will shift the dial calibration 20 to 25 kilocycles or about $\frac{1}{2}$ " on the dial scale.

To reduce frequency drift caused by humidity, all oscillator and radio frequency coils, terminal boards, range switches, R.F. sockets, variable condenser terminal boards, etc., are impregnated in a special high grade wax and then cold dipped to form a heavy wax seal. The resistors used in the oscillator circuits are the insulated type to reduce capacity changes with humidity.

Frequency changes caused by the normal temperature rise of the chassis and variation in room temperature present a serious problem. The coils expand with an increase in temperature which results in an increase in inductance. The distributed capacity of component parts including the variable condenser increases. Both of these effects lower the frequency of the oscillator circuit and would cause considerable shift in dial calibration. To compensate for this shift toward a lower oscillator frequency, the 100 MMF padding condensers are designed with the proper negative coefficients of capacity as the temperature increases. The oscillator frequency and therefore, the dial calibration for the spread-band scales remains fixed, after the short initial warm up of the tubes, over the normal variations in room temperature and the additional increase in chassis temperature after the receiver has been placed in operation.

Easy to Load



A feature of the new RCA Crystal Pickup, Stock No. 14818, is that the needle is inserted in the pickup from the top and automatically adjusts itself to the correct position. This pickup comes complete with needle positioning bracket for \$14.95 list.

TWO IMPROVED RECORD PLAYERS NOW AVAILABLE

Record Players Attach to Radios; Are Easily Sold By Service Men

To help radio dealers and service shops capitalize more fully on the remarkable revival of interest in recorded music and on the tremendous growth of the market of music-lovers created by such outstanding radio projects as the Metropolitan Opera and symphony orchestra broadcasts, RCA Victor has announced two greatly improved record playing instruments in the low-price range. The new instruments are of the type which reproduces phonograph records when connected to electrically operated radio sets.

As a successor to the trail-blazing R-93 model, which established a unique record of continuously mounting sales since its introduction, RCA Victor introduces record-player model R-93-A, with a suggested list-price of \$18.50 in the East. In appearance the new instrument resembles a handsomely finished chest or cigar humidor. The Camden engineers have made a number of notable improvements in the R-93-A. These include a more efficient motor insuring more constant speed of the turn-table; an improved pick-up arm, which gives an even better tonal range; quieter operation and marked improvement in the bass response through the use of bass compensation.

Plays 10- or 12-Inch Records

To replace another popular record-player, Model R-93-2, RCA Victor introduces the latest in de luxe record-players, Model R-94, at suggested list-price of \$28.95, in the East. This instrument is housed in a handsome hinged cabinet of choice walnut veneers, beautifully finished. Its mechanism is completely new and a vast improvement over its predecessor. Both 10-inch and 12-inch records may be played on it with the lid closed. Automatic starting of the turntable and bass compensation are two of its superior features. The excellent tonal balance of the previous model has been retained and in addition uniformly good reproduction at low volume has been provided by a new compensated volume control.

Judging from the sales records of the previous record-playing instruments, the new RCA Victor record-players have a three-fold value to all radio dealers. They help increase the unit of sale; they stimulate repeat store traffic in his establishment; they open up additional sales opportunities with existing time payment radio accounts, and they help to make his store headquarters for musical entertainment of all kinds—not just radio entertainment.

Good Technical Stories Found In RCA Review

Of special interest to service men are several timely articles in the July issue of RCA Review. Among them are: "New Features in Broadcast Receiver Design," "A New Antenna Kit Design," "Batalum' a Barium Getter for Metal Tubes" and "Recent Developments in Diversity Receiving Equipment."

In reviewing the subject matter in the new July issue of RCA Review it is seen that there are two articles on broadcast receivers and their antennas, one on television transmitters, one with references to television, one on direction finders, one on broadcast transmitting antennas, one on communication receiver systems, one on the technique of receiver tube construction and one mathematical paper dealing with modern tube problems.

Special Rates

Special two- and three-year rates now apply to RCA Review. The rates for United States and Canada are: 1 year, \$1.50; 2 years, \$2.50, and 3 years, \$3.50. The foreign rates are \$1.85, \$2.20 and \$4.55 for 1, 2 and 3 years.

Volume II of the famous Television book is expected to be off the press about August 15, when complimentary copies will be dis-

Experiments In Television Are Begun By CBS

RCA Equipment Ordered For Experimental Station On Chrysler Building

Further progress in the development of practical television is indicated by the following excerpt from an editorial that recently appeared in the magazine "Broadcasting:"

"The fact that RCA has taken an order for television equipment from CBS, which will install its experimental transmitter atop the Chrysler Building in New York, would at first blush indicate that television's elusive corner is about to be turned. As a matter of fact, CBS, like RCA-NBC, intends to conduct exhaustive tests along the same lines as those of RCA from the Empire State Tower and with much the same equipment. Neither network really knows when television will be ready for the public locally in New York, where it will most likely get its American start.

Research Benefits Whole Industry

"On the other hand, the sale of RCA equipment to CBS is significant to the broadcast advertising industry for several reasons. First, it shows that RCA has no intention because of its technical advantages, of 'hogging' television for its network subsidiary, which means that it will undoubtedly sell or license apparatus freely to all comers (meaning all licensed broadcasters wanting it) when television is ready. In the meantime, it is conducting the laboratory and field research at enormous expense—an expense which no single broadcaster could conceivably bear.

"That RCA has a preeminent place in television development so far seems to be borne out by the fact that the British have officially adopted the Marconi-EMI system as against all others, a system which is virtually a counterpart of RCA's, and also by the fact that the Russian government has ordered complete television transmitting and receiving apparatus from RCA. All who saw the 343-line demonstrations in Radio City last winter were deeply impressed; it is said the new 441-line images are even better, aside from being bigger."

tributed to all paid RCA Review subscribers on record at that time.

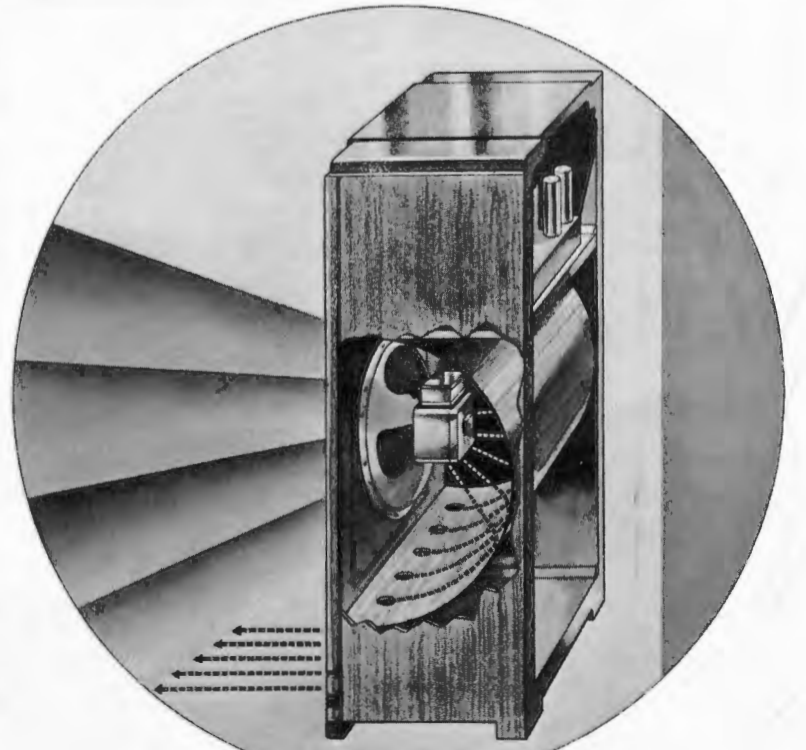
For the convenience of our readers subscription cards for RCA Review are being enclosed with this issue of Service News.

On Location



This picture proves that Joe E. Brown can get interested in something other than baseball and fire fighting. Here he is shown on location near Hollywood listening intently to a sound technician's explanation of part of the RCA Photophone Sound Recording equipment. Leading Hollywood film companies are now producing films recorded by RCA's Ultra-Violet process

Sonic-Arc Magic Voice



The view above shows the structural details and principle of the amazing new "Sonic-Arc" Magic Voice. The curved back and scientifically placed holes direct the sound waves from the back of the speaker so that they reinforce the waves from the front rather than partially cancel the front waves as in ordinary speakers