



RADIO SERVICE NEWS

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INTER-PHONES ARE HOT ITEMS

FIRST SERVICE MEETS BRING BIG TURNOUTS

More Meetings to Be Held In Many Other Cities and Towns

Philadelphia — Before interested gatherings of servicemen, numbering over 400 in New York and 350 in Philadelphia, the Technaural Series of RCA Fall Service meetings was inaugurated in a big way.

The New York meeting was sponsored by local RCA Victor Distributors and held in conjunction with the RMA Trade Show and IRSM Convention. The Philadelphia meeting was sponsored by Raymond Rosen Company, with the Philadelphia Radio Service Men's Association participating.

Service Association officers present expressed the view that servicemen undoubtedly were pleased with the material presented and the demonstrations that were given. Comments heard after the meetings indicated exceptional interest in technical details and applications of various types of microphones, volume expansion and compression, remote volume control, and of course the 60 and 100 watt permanent magnet loudspeaker.

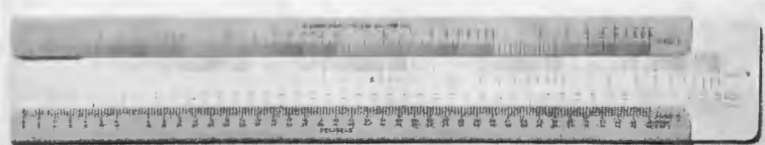
Powerful Magnet

At the Philadelphia meeting, in order to remove any doubts as to the "holding" ability of the permanent magnet, used in the 100-watt speaker, one was placed on a table and everyone invited to test his strength by trying to lift a small bar of iron from the magnet. We do not know whether any person present lost a fingernail or perhaps pulled a wrist out of joint, but we do know that no one lifted the bar from the magnet. Of course a couple were able to slide the bar off the magnet. There is still some doubt as to whether their feet were on the floor or braced on the side wall of the auditorium when this was done. At any rate everybody agreed the magnet had plenty of magnetic strength.

New Slide-Rule Shown

The explanation of an original method of dial calibration of spread- (Continued on Page 7, Column 5)

Handy New Tool



Here is a special slide rule developed by the RCA Service Division and now being distributed by RCA Commercial Sound distributors. It enables the service engineer not only to use a simple and accurate harmonic method for dial calibration and alignment of band spread receivers, but also to convert power ratios to decibels, and vice versa. The price is 50c. Many distributors are offering the rules as door prizes at RCA Technaural Service Meetings

Added Efficiency For Her



The boss' secretary becomes even more efficient when she can talk back and forth with the boss over an RCA Victor-Phone. This two position system requires no wiring. Just plug the two units into a power line and talk. The whole system costs only \$76.50

Six-Page Ads In "Life" Tell Story of RCA

New Magazine Within A Magazine Helps Sell RCA Products

RCA Radio Tube dealers are now benefiting from the most spectacular advertising scoop in years—the six-page advertisements run by RCA once a month in the magazine Life. RCA's latest advertising triumph (Continued on Page 6, Column 2)

New Antenna Designed For Big Buildings

Multi-Wave Antennaplex Solves The Problem For Hotels, Apartments

The usual jungle of antenna wires atop apartment houses and hotels is eliminated and far better foreign and domestic reception for any number of receivers is afforded by RCA's latest achievement in antennas, the RCA Multi-Wave Antennaplex, designed for use on all buildings housing a large number of receivers.

At last cliff-dwelling owners of fine multi-wave radios can enjoy them to the full. But the RCA Multi-Wave Antennaplex does more than provide, with a single antenna, better reception of foreign and domestic broadcasts, including police, aviation, and amateur calls. It is also a boon to the apartment house, hotel, or hospital manager who might wish to use the roof of his building as something other than a site for a maze of individual antennas. Radio departments in stores that keep a large number of receivers ready for demonstration (the RCA Magic Wave Antenna (Continued on Page 7, Column 3)

Talk-Back Systems Easily Sold To Offices, Factories and Homes

Two-Position System Requires No Wiring; Operates From A-C or D-C Power Line

Package merchandise in the truest sense—and a hot item for dealers and service engineers—is the new RCA Victor-Phone Inter-Communicating System that requires no wires. It, along with a multi-position

wired system, is shown in the new RCA Commercial Sound Catalog No. 211 now being distributed by RCA Commercial Sound jobbers.

The strictly package-merchandise item is a two-station inter-communicating system that requires no wires and which retails for only \$76.50. Just plug the two handsome units



This is the remote unit of an RCA Victor-Phone multiple-position wired system. Note the switch that enables the remote position to call the master unit

into either an A-C or a D-C 110 v. outlet, press the button, and talk. That's all there is to it with this system for which innumerable uses will be found in both offices and homes. Because of the ease of installation, the system can be readily sold over the counter. It also makes an ideal item for quick demonstration and easy sale by service engineers in the prospects home or office.

Uses Carrier Frequency

The system makes use of the carrier frequency of the power supply lines. The 100 kc. frequency to (Continued on Page 4, Column 5)

Jobbers Offer Liberal Deals On Equipment

Service Tools and Sales Aids Free With Tube Orders

"Write your own deal" is what RCA Radiotron distributors are saying in effect these days, and as a result service engineers are getting RCA Oscillographs, Oscillators, Tube Checkers, sales promotion material, etc., on the most liberal "deals" ever known in the tube business.

Rather than offer selected items on deals formulated at the factory, and which might not suit all dealers, RCA has made an arrangement (Continued on Page 6, Column 3)

New 150-Watt Transmitter Is Announced

ACT-150 Designed For Use By Advanced Amateur Operators

Real broadcast quality and appearance in a transmitter—the ambition of every "ham"—is now available to advanced amateurs in a new 150-watt RCA transmitter known as the ACT-150. It has every feature of design and performance an amateur could wish for and some the amateur might not think of, and sells to amateurs at only \$625, f.o.b. factory.

The new RCA transmitter will be available through RCA amateur distributors about November 15. The price of \$625 includes a separate (Continued on Page 3, Column 4)

A Dream



The RCA Amateur Transmitter ACT-150 is of the type of equipment most amateurs dream of owning some day. Now they can have it at less cost than ever before

Explains Output System of RCA Receiver 816-K

Technical Details of New Deluxe Instrument Told by Engineer

By PAUL F. G. HOLST
RCA Engineering Dept.

The sound output of a radio receiver is determined by two factors, first the amount of electrical energy the output system can supply to the speaker and second the efficiency with which the speaker transforms this energy into sound. Due to the difficulty in defining and measuring speaker efficiency, the power output of a radio receiver is usually rated as the electrical energy which the output system can supply to the speaker. In this connection, it should be noted that the speaker used in the 816-K is twice as efficient as the corresponding speaker in the 1937 receiver line, which makes the 30 watt rating of the 816-K the equivalent of 60 watts in the 15-K.

The output system and its associated power supply of the 816-K is shown in Fig. 1. The output energy is furnished by a pair of RCA-6L6 "Beam Power Tubes" in push-pull connection. In addition to their high power capacity, these tubes have a high efficiency due to the sharp "knee" in their plate current characteristic, which makes a greater undistorted plate swing possible. They have furthermore the advantage that the distortion introduced by single ended operation of a 6L6 consists of even harmonic of low order, a type of distortion of less objectionable character, than any other, and which may be can-

Shadow Tuning



And now how do you like enchanting Noel Mills, shown above? Maybe you've heard her over NBC in the "John's Other Wife" and "Kitchen Cavalcade" programs

non-linearity of each tube does not introduce undue distortion on account of the cancellation of even harmonics which, as mentioned above, is practically the only type of distortion introduced by each of the tubes. The "Class AB" opera-

output power, arrangements have been made to drive the control grids of the output tubes. Referring to Fig. 2, it will be noted that unless the control grids are driven positive, it is impossible to utilize the part of the tube characteristic located between (a) and (b). However, when the grid voltage on either tube becomes positive the tube will draw grid current as shown in Fig. 3 and a driver stage

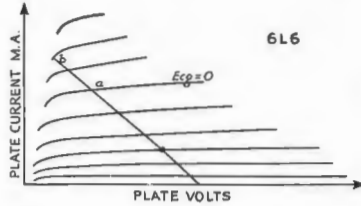


Figure 2

is required to supply the power consumed by the control grids. It will be noted that this load is only present over a part of each cycle, and it is therefore necessary not only that the driver stage is capable of supplying the required power, but also that the impedance in series with each grid is kept so low that the intermittent load of the output grids does not affect the voltage output, a condition which would introduce distortion.

The driver stage consists of an RCA-6F6 pentode operated as a triode to secure a low plate im-

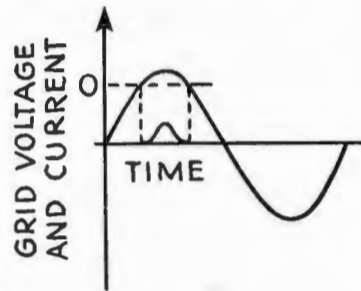


Figure 3

pedance. This tube is coupled to the output stage by means of a step-down driver transformer. It has been found that this transformer must have a very low leakage inductance in order to avoid objectionable distortion. For this reason, the 816-K uses a split winding transformer for this purpose.

The output stage is coupled to the speaker by means of the output transformer whose primary purpose it is to match the speaker impedance to the tubes. This matching is further improved by means of the resistor-capacitor network connected across the primary. The network serves to keep the load on the tubes more nearly constant and resistive over the part of the audio range where the speaker has an inductive impedance.

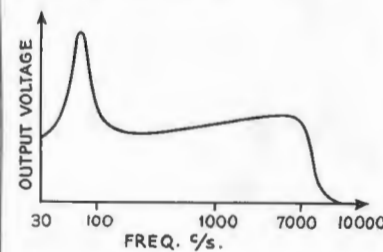


Figure 4

In addition, the output transformer serves as a low-pass filter with a frequency characteristic as shown in Fig. 4, where it will be seen that the frequencies above 7,000 cycles/second are attenuated to a considerable extent. This feature is highly desirable inasmuch as no signals passed by the r-f and i-f circuits will be lost, but the effect of spurious signals, such as monkey-chatter, hiss and distortion, will be eliminated to a large extent.

This performance is obtained by means of a capacity loaded tertiary winding on the output transformer.

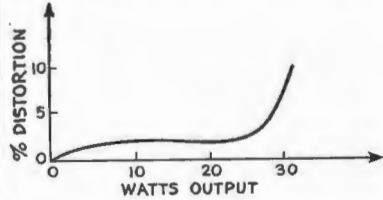


Figure 5

The action of the tertiary is that of a trap circuit shunted from plate to plate across the output. The resonating elements in this absorption circuit is first the tertiary capacitor and second the leakage inductance between the primary and the tertiary windings. This low-pass filter is further improved through the addition of the two capacitors from each of the anodes to ground.

Just Plug In and Talk



With two of the devices shown above, and nothing else, you have a communicating system that requires no wires. Just plug two of these RCA Victor Phones in on any A-C or D-C line and talk. List price is \$76.50 per pair, with tubes. If more than two stations are needed, the RCA Victor-Phone Master Wired System should be used

Police Radio Reduces Crime, Chiefs Agree

Savings to Taxpayers and Greater Efficiency Also Reported

The value of police radio communications as a powerful deterrent to the commission of crime and as a swift means of apprehending criminals, was almost unanimously stressed by police officials from many sections of the country who participated in a symposium conducted by the Police Radio section of the RCA Manufacturing Company.

A committee of three judges consisting of Charles W. Newns, Supervisor of Police Radio in Philadelphia; James S. Howell, Chief of the Electrical Bureau of Camden, N. J., and Louis F. Neese, Supervisor of Police Radio of Trenton, unanimously selected three of the statements in the symposium for special prizes which were presented by the RCA Manufacturing Company. Superintendent of Police Charles A. Wheeler, of Bridgeport, Conn., a veteran of 43-years of police work was awarded first prize. Second prize was awarded to Desk Sergeant D. W. Hawkins, of the Petersburg, Virginia, police department. Third prize went to Chief of Police Samuel

D. McLeod, of New Bedford, Mass. The judges announced that so many of the statements were of uniformly high calibre that 63 were singled out for Honorable Mention.

50 Per Cent Less Crime

Statements submitted by scores of police heads stressed the importance of radio in discouraging crime, especially of the petty variety, because of the speed with which police aid may be summoned to the scene of trouble. Some cities reported a reduction in crime as high as 50 per cent since the use of radio. Many cities whose police budgets had been drastically cut during the depression years were able to make up for a deficiency of personnel and increase protection through the mobility of police radio cars.

One New England city reported a saving to taxpayers of \$164,000 annually since the installation of a police radio system through a consolidation of precinct headquarters and reduction of personnel. Another city in the midwest effected a saving of \$36,000 a year with an increase in operating efficiency. In an Eastern city, police radio has cut down fire department trips by 75 per cent; two police cars have been equipped with three fire extinguishers each and respond to all fire alarms before the general alarm is turned in. In another city large reductions in insurance rates were made possible through the installation of a police radio system by the local government.

Radio Dramas

Numerous dramatic incidents illustrating the speed with which police aid is summoned by radio were cited by the police chiefs. Would-be robbers of a mill treasury in a New England town were caught, identified and had signed confessions within 90 minutes of the time the first radio call went out and the prisoners began serving 20-year state prison sentences four days after capture. In a Southern city, a police radio car crew caught a burglar red-handed on the second floor of a house while a card party was in progress on another floor, before anyone in the house was aware of the burglar's entry.

A train wreck was averted by police radio when a patrolman noticed a rod hanging from a car of a passing freight train and got word to a railroad official in a few seconds so that the train was stopped in time. In Kansas, the kidnapper of an entire family was apprehended in a few minutes by police radio co-operation between several cities. In several cities, police officials reported that radio has done away with antiquated methods of calling a patrolman off the street when wanted.

RCA TEST EQUIPMENT

On Attractive Deals

RCA has made it possible for your RCA Radiotron distributor to offer you all RCA Test Instruments on no-cost deals with the purchase of RCA Radio Tubes. Now you can have the equipment you need. Just

ASK YOUR
RADIOTRON DISTRIBUTOR

You Can't Miss It



It seems there's no advertising medium that is not being used to tell the public about the 1938 RCA Victor line. Mook Electric Supply Company, Cleveland RCA Victor Distributors, capitalized on public interest in the recent National Air Races to bring the RCA Victor Electric Tuning message before the crowd of 300,000 gathered at the aviation classic. RCA Super Power Speakers supplied the sound for the enormous throngs

Guest Star



Helen Jepson, whose spectacular rise to fame as a radio star and Metropolitan Opera prima donna is a tradition of radio, is one of the most popular of guest stars. She has been heard frequently on RCA's Magic Key program.

Organize New Service Men's Association

Organization To Be Run Entirely By Active Members

Chicago—A movement to bring all service men and all service men's organizations together in a national organization to be managed entirely by the service men themselves is underway, according to an announcement from Jerome J. Kahn, trustee of the Reorganization Committee Serviceman's Association.

"Radio Service Men of America, Inc., is the name designated for the new national service men's association which has just been organized in Chicago," stated the written announcement. "The organization is new in every respect, and is run entirely by service men. . . . Basically, it is anticipated that Radio Service Men of America, Inc., will function as a central source for gathering and disseminating information on developments in the radio field, that it will serve as a central liaison between manufacturers and local service men's associations, and that it will serve as headquarters for improving and promoting the welfare of the service man.

Existing Groups Approve

"Mr. Joe Marty, with the active assistance of the Sales Managers Clubs, both eastern and western divisions, and a number of interested manufacturers, has been busy contacting service organizations in the east and middle west. Mr. Marty states that every group he has visited and to whom he has explained the purposes of Radio Service Men of America, Inc., has assured him of their approval and

Want Prompt Service? Here's How to Get It

Dealers and service engineers can be sure of getting prompt service and can save themselves needless correspondence when ordering RCA Radiotron sales promotional material if they will follow the ordering instructions given in the RCA Radiotron Sales Aids Catalog, according to H. E. Hortman, in charge of the distribution of this material.

RCA maintains a large department equipped with the most modern apparatus for imprinting sales promotional material for dealers. Every effort is made to ship material as promptly as possible, but one week should be allowed as time required for imprinting, since special campaigns some times put an unusually heavy burden on the imprinting department.

Observance also of the following points will speed up service and eliminate unnecessary correspondence, according to Hortman:

1. Print imprinting instructions clearly. Follow specifications in catalog—usually not over three or four lines.
2. Order in quantities specified in catalog.
3. When ordering the service man's coat, counter coat, or shirt, be sure to specify whether gray or white and give the measurements called for in the catalog.
4. Tube Test Stickers No. 604 have been discontinued and superseded by No. 1402 Stickers which can be used on either metal or glass tubes.
5. Orders sent direct to us by dealers must be accompanied by remittance.

promised 100 per cent co-operation. "Local organization or individual service men in cities where there is no organization are cordially invited to write for more details to Mr. Joe Marty, Monadnock Block, Room 1533, Chicago."

"Hams" Adopt RCA Universal Transformers

Unit First Designed For Class B Radios Useful In Amateur Work

Trust the "hams" to recognize something good in the way of radio equipment. Many of them have discovered that the RCA Universal Transformer for Class B Radios, No. 9552, is an ideal unit for many amateur purposes. As a result sales of this unit are soaring far beyond what was expected of a transformer originally designed for a specialized field.

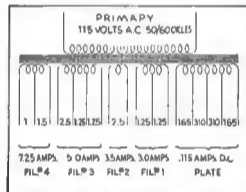


No. 9552 Transformer

There are four types of RCA Universal Power Transformers. All have the same attractive appearance, universal mounting brackets, and numerous windings. The No. 9552 Transformer has made a hit with amateurs because it

has the quality amateurs must have and because its secondary has a voltage of 475 each side of center tap and a current rating of 115 milliamps, making it excellent for low power amateur transmitters, modulators, etc. The list price is \$6.00.

Reduce Inventory
To the service engineer RCA Universal Transformers appeal because with only the four units the



Taps of No. 9522 Transformer

great majority of all repair jobs can be handled.

With these four units plus the RCA Universal Interstage Audio Transformer and the RCA Universal Output Transformer, a service shop can handle the majority of jobs with only a very small investment tied up in transformers of all types.

A Complete Line

The audio transformer, No. 9632, has a center tapped primary and a center tapped secondary for connecting either from or to any single or push-pull stage. The list price is \$2.00.

Investigate RCA Universal Transformers at your parts jobber. As one dealer reported, he preferred RCA Universal Transformers because he "never had to replace a replacement."

New 150-Watt Transmitter Is Announced

(Continued from Page 1, Column 5)

rate speech amplifier and a set of coils for one band, but does not include tubes, or crystal, microphone and other accessories which the amateur may wish to choose for himself.

150 Watts Output

As its name indicates, the ACT-150 has 150-watts output CW and phone from 10 to 160 meters (1715 to 30,000 kcs.). The special speech amplifier insures high quality voice reproduction. Elaborate shielding and other refinements of design make R-F feedback practically impossible—a performance feature that will appeal to every amateur operator.

Specifications

OUTPUT: 150 W. on all frequencies; 1715-30,000 kcs.
POWER REQUIREMENTS: 1150 W. 100% Modulation; 900 W. C-W.

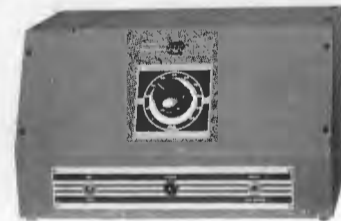
POWER SOURCE: 110-120 v. 50/60 cycles.

MODULATION: High Quality, High Level, Class B Plate Modulation.

CABINET DIMENSIONS: 20 7/8" wide, 17 3/32" deep, 46 7/8" high.

R-F STAGES: Crystal Oscillator RCA-807, Buffer/Doubler RCA-802, Driver 2 RCA-807, Power Amplifier 2 RCA-808.

AUDIO STAGES: SPEECH AMPLIFIER Input RCA-6J7, 2nd Stage RCA-6C5, Output RCA-6C5, Rectifier RCA 80, MODULATOR Drivers 2 RCA-2A3, Modulators 2 RCA-808.



Pre-amplifier of ACT-150

POWER SUPPLY: Exciter RCA-83, Bias and Driver Plate RCA-5Z3, High Voltage 2 RCA-866.

ANTENNA TUNING: Two variable capacitors series connected to antenna coupling.

METERS: 0-500 ma. P.A. plate; 0-200 ma. Selector Switch to oscillator plate, buffer/doubler plate, driver plate, P.A. Grid.; 0-15 v. modulation indicator; 0-3 a. antenna current.

SWITCHES: Filaments and bias supply, exciter plate, P.A. plate, tuneup, C-W and phone, high voltage interlock, speech amplifier.

CONTROLS: Osc. Plate, buffer/doubler plate, driver plate, P.A. plate, antenna tuning, neutralization, audio gain.

Shipping Weight 520 pounds—Net Weight 330 pounds.

Accessories

- Crystal Oscillator Coil \$1.75
- Buffer/Doubler Coil 1.75
- Driver Coil 1.75
- Final Amplifier Coil 8.25
- RCA Transmitting Tubes required, Amateur's net price. 48.00
- RCA Receiving Tubes required, List price 12.40
- RCA Aerodynamic Microphone (MI-6226), Amateur's net price 15.90
- RCA V-Cut Crystal and Holder (TMV-135), Amateur's net price 9.85

Silas Egglemud



"The boss is so dumb he thinks an oscillator is a kisser."

New NBC Star



Lora Marlo, glamorous new dramatic find, will be heard over the NBC networks during the coming dramatic season and we thought you'd like to see a picture of her. Especially this one.

combination of the side speakers and the center of the proscenium arch loudspeakers.

In the early days of sound reinforcing, it was considered very bad form to cross the beams of the loudspeakers, but more recently it has been found, in a large number of installations, that very excellent results can be obtained by crossing the beams of the speakers, or, in other words, to direct the sound of the loudspeaker located on the right of the stage to the left far corner, while the speaker on the left side of the stage is directed to the far right-hand corner.

Directional Baffles Best

In a study of thousands of speaker installations, it has been found that directional baffle loudspeakers fulfill the requirements of an ideal loudspeaker for auditorium installations. By means of these directional baffles, it is possible to direct the sound efficiently to the desired areas. It has also been found that the efficiency of a flat baffle speaker is from 3 to 7%, while the efficiency of a well-designed directional baffle, together with a speaker mechanism, may vary from 25 to 60%, depending on the design of the speaker mechanism, and also on the design of the baffle.

The angle of distribution of a flat baffle is considered to be 90 degrees, thus making it hard to control the output, while with directional baffles the degree of coverage can be controlled in the design of the baffle. At this point, it may be interesting to explain just how the distribution angle is determined. In the placing of loudspeakers and the proper use of baffles in large installations, knowledge of the distribution angle is essential.

Distribution Angle of Speakers

To determine the distribution angle, a constant frequency tone is applied to the loudspeaker. A microphone is then placed directly in

front of the speaker) of the amplifier output is available for the ear. Due to the great advances in mechanical and electrical design of loudspeakers, public address speakers have been built with efficiencies up to 60%, thus making it possible to use smaller amplifiers, and still obtain sufficient coverage for large auditoriums.

Placement of Material

Now, let us consider that the types of loudspeakers have been determined upon, their placement and also the acoustic requirements have been calculated. The question now arises, where shall the acoustic treatment differ from the example auditorium when no sound reinforcement was used? Basically, it is the same, except that more care must be taken in the placement of the material. When an amplifier system is used, the signal striking the ear is a great deal higher than that when only the human voice, unamplified, strikes the ear. Even with the use of directional type baffles, the sound out of the covering area of the loudspeaker is greater than the voice unamplified would be. Therefore, if you will recall the characteristics of our problem auditorium, in each of the end bays (total of nine) we assume 48 square feet of glass surface. Now as glass is an excellent reflector of sound, it is recommended that these windows be draped in order to absorb the sound striking them, instead of having the sound reflected back by the glass.

Sound acts very similar to light, in that it is reflected back at the same angle as it strikes a reflector. This sometimes can be used to advantage, but under most conditions it causes trouble. In a low-ceilinged room where the sound is projected nearly straight out, it is very essential to have the windows draped in order to properly use the average microphone. These drapes absorb some of the sound and this makes it

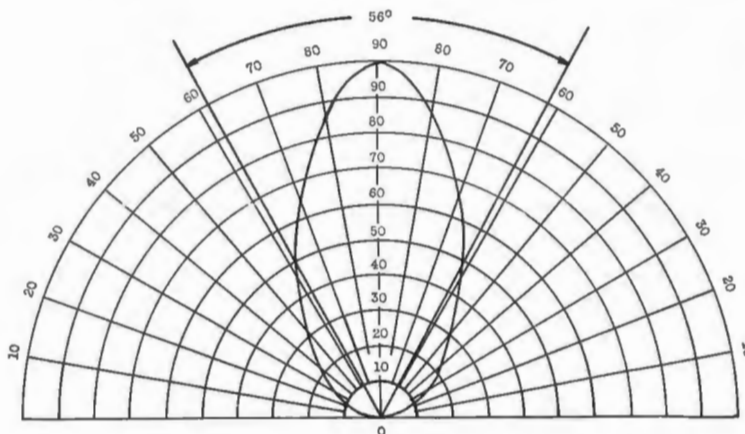


Diagram of Loudspeaker Coverage

front of the loudspeaker and a measurement is made of its acoustic output. Then, on the same radius, the microphone is moved to one side in steps of say 5° or 10°, with measurements taken at each point.

When these measurements have been taken, they are plotted on a chart as shown, that is, in this special problem as shown on the chart, the 10° measurement happens to be 86% of the measurement made directly in front of the loudspeaker. The measurement made on the 20° line is 65% of the direct measurement, and the measurement made on the 30° line is 45%, and so on until the curve is made. In other words, the measurements are plotted on the graph and a smooth curve drawn through them. Then we note where the curve passes through the line of 50% response, and we call this the "angle of distribution." Of course, this angle should be equal on both sides of the zero axis and the angle is measured between the two lines passing through the 50% response arc.

Acoustic Output Defined

Putting it briefly, the distribution angle is the angle at which the intensity of the sound coming from the loudspeaker decreases 50% both sides of the center. To the uninitiated, 50% may seem a very high percentage, but to the average human ear this decrease is hardly noticeable except by direct comparison, and that is not possible in a large auditorium.

It may also be a good idea at this point to define acoustic output. Acoustic output is a translation of the electrical output of the power amplifier by the loudspeakers to audio output. The ordinary loudspeaker in a radio set receives the output from the receiver amplifier and transfers this energy to sound. In this transfer, due to the inefficiency of the loudspeakers, only 3 to 7% (depending on the design of

when no absorption material is used, the sound can be heard bouncing back and forth between the floor and ceiling as many as seven times.

As the auditorium fills, the reverberation time will change; let us, therefore, calculate the time with full audience to show how it changes.

$$T = \frac{.05 V}{\text{abs}} = \frac{.05 \times 763,375}{26,914} = 1.42 \text{ seconds approximately.}$$

It will be seen that the time of decay of the sound will vary from 2 seconds with no audience to 1.42 seconds as the auditorium fills to its maximum capacity.

Placing Loudspeakers

Now, let us consider the use of loudspeakers in this sample auditorium. One of the first considerations is the placement of the loudspeakers. These loudspeakers should be so located that they will be ahead of the microphone placement, or, so that they will project the sound out over the microphone. They must also be located so that complete coverage of the seating area can be obtained. In the placement of the speakers, there is more than one condition to take into consideration. The most critical condition is illusion. The loudspeakers should be so placed that the sound coming from them appears to come from the person using the equipment, and not from the side of the stage or from some other position.

The best location for the loudspeakers, to give the proper illusion, has been found to be in the center of the proscenium arch. But, if because of the building structure or some other reason, this is impracticable, the loudspeakers may be placed at each side of the stage. It has often been found necessary to place loudspeakers at the side of the stage when the auditorium has deep balconies, in order to cover completely the areas under these balconies. At the same time, it becomes necessary to place loudspeakers in the center of the proscenium arch for the coverage of the balcony; and in this set-up we have a

AUDITORIUM ACOUSTICS WITH SOUND REENFORCING

by Albert K. Ward, Commercial Engineer
RCA Manufacturing Company, Inc., Camden, N. J.

In this article we discuss sound reinforcement in an auditorium which has been analyzed for acoustic treatment.

In the last article it was found that the reverberation time, without any sound absorbing material used in the construction of the building, was 2.62 seconds, while the optimum time for this size auditorium has been found to be approximately 2 seconds. When sufficient absorbing material has been added to decrease the reverberation time below 2 seconds, the sound should be amplified in order to project the sound to the far corners of the auditorium. Too much absorbing material will make the auditorium sound dead, but this is a problem that should not bother us in a large auditorium (of approximately 197 ft. x 125 ft.), due to the fact that it is practically impossible to have enough wall area for covering with absorption material to give this effect.



A. K. Ward

Empty Hall Calculations

Therefore, we will now calculate the absorption material required for the auditorium without taking an audience into consideration, as would be done in most places if plenty of money is available.

$$1000 \times 4.7 - .1 = 4600 \text{ more Sabine units (absorption units).}$$

$$4600 \div 76 = 6052 \text{ square feet approximately of material required.}$$

This then would give a grand total of $10,890 + 6052 = 16,942$ sq. ft. of absorbing material to be placed on the ceiling. The placing of the absorbing material on the ceiling will keep the sounds from the floor, such as hand-clapping, stamping of feet, yelling, etc., from echoing from the ceiling. In some auditoriums we have found that

NEW TWO-WAY TALK SYSTEMS EASILY SOLD

(Continued from Page 1, Column 4)

which the units are tuned may be varied ± 25 per cent, thus permitting as many as three systems to operate in proximity to each other without interference. Voices up to ten feet from the instrument will be picked up and transmitted to the other unit of the system at any reasonable distance away on the power line providing no transformer intervenes on the line.

"Direct mail campaigns and novel store displays will prove effective sales stimulators for both this system and for our wired communicating system," stated W. L. Rothenberger, manager of the RCA Commercial Sound Section. "However, if I were a dealer or service engineer and wanted some extra profits right quick, I'd tuck one of these unwired systems under my arm and head for the large office buildings or high class residential sections. Try it, and you'll be surprised how often you'll have a hard time keeping your sample for the next call."

Multi-Position System

For inter-communicating systems that require more than two positions there is the RCA Victor-Phone Master Wired System. By rotating the Selector Switch of the master unit of this system, any one of five (or less) remote positions may be called. After the selector switch of the master unit is turned to the proper position, conversation with a particular remote unit can be carried on without touching the "talking" switch of the remote unit. When the operator of the master unit is out of the office, he can have his secretary hear all incoming calls by turning the selector switch to the "secretary" position.

Connections between the various units of this system are simple, only a three-wire cable being required to connect each remote unit to the master unit. Privacy is insured by the individual wiring of the system.

Specifications Wired System

The Master Unit, with tubes, is No. MI 6351, list price \$39.50. It measures $7\frac{1}{2}$ " high, $10\frac{3}{4}$ " long and $6\frac{1}{8}$ " from front to back. Power consumption is 45 watts. Tubes used: 1 RCA-6J7, 1 RCA-25L6, 1 RCA-25Z5. Net weight, $8\frac{3}{4}$ lbs.

The remote unit is No. MI 6352, list price \$12.50 each. Dimensions: height, $6\frac{1}{2}$ ", length, $8\frac{3}{8}$ ", depth, $5\frac{3}{4}$ ". Net weight, $2\frac{3}{4}$ lbs.

Specifications Unwired System

Dimensions: height, $7\frac{3}{4}$ ", length, $10\frac{3}{4}$ ", depth, $6\frac{5}{8}$ ". Net weight: 16 lbs. Carrier frequency: 100 kcs. ± 25 per cent. Tubes: 1 RCA-25Z5, 2 RCA-43, 1 RCA-75. Input power: 40 watts. List price, per pair, with tubes, \$76.50. Stock No. MI-6350.

RCA Victor-Phone Master Unit



This is the Master Unit of the RCA Victor-Phone. Note the switch that allows the operator of the Master Unit of an RCA Victor-Phone wired communicating system to call any one of five remote units. When the switch is turned to the "Secretary" position, the secretary can take all calls in the absence of the Master Unit operator

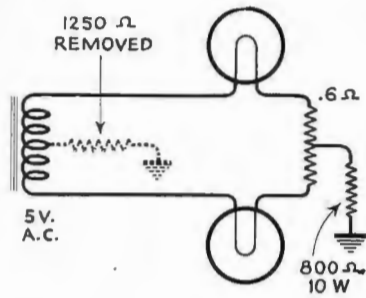
Service Tips



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.

Modernizing Sparton 931

I was called on to modernize a Sparton 931. The set needed little attention; only the tubes were weak. As in my fourteen years' experience I have never handled anything but RCA Tubes, with the consent of the owner I proceeded to adapt this set to RCA Tubes. The original 182s were replaced with RCA 45s. As the 182s are 5-volt, while the 45s are only 2 1/2-volt, the filaments were put in series with the 1250-ohm biasing re-



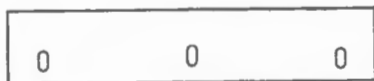
sistor from center tap of filament winding to ground removed, and an 800-ohm, 10-watt resistor from the center arm of the .6-ohm hum-balancer to ground substituted, as shown in diagram.

The six 484s were replaced by RCA 56s. The only change in this circuit was to load each side of the respective filament winding with .03-ohm resistor of heavy wattage. (In my case, I used a 1/16" iron wire for the resistor.) The owner not only paid my bill but congratulated me on a good job well done.

Alfred Pogany,
5145 Wyalusing Ave.,
Philadelphia, Pa.

Non-Tear Ring Binder

Here is a simple device that I have found very effective in preventing Service Manual sheets from catching and tearing at the rings of a loose-leaf binder. Preferably it should be made out of tough, hard cardboard, but even the back of a writing tablet will do. Cut two



strips, each about two inches wide and the length of the sheets used. Punch as in diagram, using a 1/4" punch. Note that center hole is about 1/4" further in toward center of strip. Place strips on the outside of Service Manual sheets and you will be surprised at how the sheets are kept from catching and tearing.

Norman E. Nelson,
P. O. Box 9,
Clifford, No. Dak.

Safety First Tongs

While servicing a set "hot" I have found a pair of photo print tongs, made of bamboo, and available in any photo supply store, of value since loose connections can be spotted by taking hold of individual wires with the tongs and shaking them. As the tongs are non-metallic, danger of shorts or a bad shock are eliminated. Also parts may be held in place for soldering without danger of burned fingers.

C. H. Pickett,
16908 Marlowe,
Detroit, Mich.

35's for 24's

Where '24 type tubes are used in sets prior to the '35 tubes in cathode control circuits, I find replacing 24's with 35's in the control tube sockets will result in improved control. In some old circuits it may

be necessary to install a screen to cathode resistor in order to completely control the volume.

Edmond Bense,
1946 Polk Street,
San Francisco, Calif.

Stromberg-Carlson No. 642 and Others Using Similar Sockets

Here is a tip on how to repair faulty sockets of this type without even unsoldering a single connection:

Drill out just the lip of the brass rivet on the underside of the socket and put out bakelite socket top. Then spread the contacts with a hook made of stiff wire. Emery the contacts. Tap the remainder of the rivet in the socket top to correct screw size and reassemble. This makes a perfect job.

Harry Goldstein,
1750 University Ave.,
Bronx, New York City.

Drifting on High Frequencies

With an Atwater Kent Model 318, I experienced some trouble with drifting on high frequency end of scale. I found that I could eliminate this trouble by cleaning the oscillator trimmers.

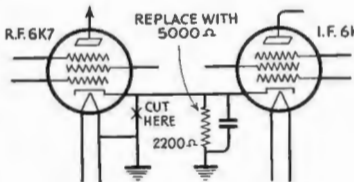
R. O. Parry,
Siegling Music House, Inc.,
Charleston, S. C.

(Editor's Note: This tip applies to all receivers.)

Noise in G.E. E86

In some localities I have found the G.E. E86 to be very noisy between stations. Here is the way I cured this:

On the 6K7 I-F socket you will find a 2,200-ohm bias resistor. Remove this and install at 5,000-ohm

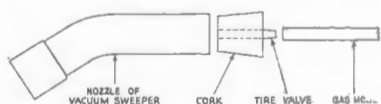


resistor. Remove cathode lead on the 6K7 R-F socket. Connect this to the 5,000-ohm resistor. By doing this you will delay the AVC to a higher bias on both the R-F and I-F tubes.

W. J. Dean,
406 Washington St.,
Gary, Indiana.

Another Chassis Cleaner

Here is a sketch of my device for cleaning dust out of radio chassis and cabinet. A large cork has a tube valve inserted through it onto



which is fastened a 6-foot length of gas hose. This cork is inserted into the nozzle of sweeper. The gas hose can be worked around chassis, cleaning it thoroughly.

Russell R. Kerr,
800 Warrington Ave.,
Pittsburgh, Pa.

Locating Interference

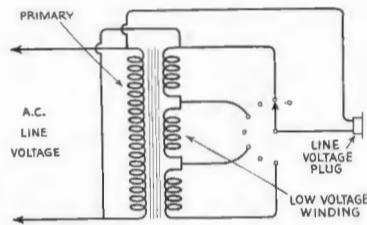
Frequently noise and interference which I am called to remedy comes from a source outside the home of the radio owner. When I am unable to locate it in the same building, and it is otherwise difficult to locate at the time of the call, I have found it helpful to patrol the neighborhood in my car, usually in the evening, with car radio on at full volume and tuned between stations. I listen for any unusual noise picked up as I pass street lights, signs, flashers, and power lines, trying to locate the same sort of noise as the customer complains about. The

car should be stopped often to tune the car radio across the full dial, listening for increase in any noise picked up. When possible, I have the device that I think is causing the trouble turned off to prove that it is source of the noise. I find most everyone is willing to co-operate in eliminating the trouble and usually will pay for the serviceman's time.

Frank M. Gray,
Vinson Carter Electric Co.,
25 East Adams St.,
Phoenix, Arizona

Testing for Fading

On a receiver which fades in the customer's home but works O. K. in the shop, fading can often be brought on again by stepping up the input A-C to the receiver in the manner described. A simple and economical method is shown in the accompanying diagram. A transformer with several low voltage windings can be connected to an



inductance switch in such a manner that these low voltages are added to line voltage as may be required. The windings are connected in series in the proper phase so that they are additive. If, upon connection, the primary voltage is reduced the connections to the low voltage winding should be reversed.

C. H. Ramm,
218 So. Bronough St.,
Tallahassee, Fla.

6F6 in Sparton 666M

When servicing these sets, do not fail to check the 6F6 output tube, because if the emission of this tube gets low the plate and grid bias voltages of the other tubes will be thrown far off normal, often far enough to cause some of the other tubes to run red hot, causing damage to the tubes and putting a very heavy strain on other parts of the set.

D. M. Raw,
Raw & Boddy,
Clearwater, Minn.

Quick Test for AC-DC Radios

A short cut in locating open filament circuit in AC-DC sets quickly (and who doesn't need short cuts on AC-DC sets?) is to use a 15-watt 110-volt lamp bulb on a length of lamp cord, with prods of some sort on the free ends. Plug the dead set into an outlet, turn on the switch, and test the wiring beginning with the AC line cord entering the set. If there is voltage there, the lamp will light. If not, carefully examine the line cord for breaks, and repair if found. If the line cord has a resistance in it, check the resistance lead at the plug, and I have found many a broken lead here due to amateur repairmen putting on a new plug. (They don't see the small resistance wire, so don't connect it up.) If you have voltage at the set, test each tube filament with your prods, and the one causing the test lamp to light is your bad tube. A simple and QUICK way to locate open filament wiring, and it really does save time over testing each tube separately in the checker, and does not burn out the rest of the tubes like you do sometimes if you try shorting filaments to accomplish above results.

Noel L. Havermale,
612 So. 20th St.,
Quincy, Ill.

Quality Control



Shown above is a scene from the Quality Control Laboratory, one of the units of the "world's greatest tube laboratories" of the RCA Radiotron Division at Harrison, New Jersey.

Eternal Vigilance Protects Quality of RCA Radio Tubes

Test Procedure at Harrison, N. J., Tube Plant Is Highly Organized

By FORREST CRAIN, RCA Radiotron Division

"Quality," says Webster's Dictionary, is "excellence of character."

However, this "excellence of character" must be properly controlled and preserved before the term can be applied to a manufactured item and it classed as a quality product. With this thought in mind, let us go behind the scenes of the RCA Radiotron factory at Harrison, New Jersey, and see for ourselves just what is being done to preserve this "excellence of character" in RCA Radiotrons.

Naturally, the first step in attempting to manufacture a quality product is to make certain that the raw materials used are the finest obtainable.

There are sixty-five various types of metal, chemical compounds and gases used in the manufacture of radio tubes; this is in addition to as many as forty separate and distinct parts which must be assembled with the greatest of care, otherwise the potential uniformity of the product is lost.

Inspection Service Department

Before any raw materials are accepted from a supplier, samples must be submitted to an Inspection Service Department. While this department is set up mainly to advise on the quality of raw materials, its reports also help the Engineering Department to exercise control over quality in regard to factory requirements.

Materials which pass this Inspection Service Department are then processed, built into parts and assembled into sample tubes. These tubes are then checked for certain electrical characteristics in a series of exhaustive tests which prove, beyond a reasonable doubt, the degree of quality of the raw materials used to build them.

Hourly and Daily Checks

The assembly of Radiotrons is an important factor in our attempt to preserve quality and uniformity. "Spot checks" on dimensions, clearances, and electrical characteristics are made at each stage of assembly and compiled into daily reports.

In addition to the spot checks made on each individual operation, certain parts require complete assembly into tubes in order to run comprehensive tests. For example, the measurement of heater dimensions can be made only on the completed tube; emission characteristics of cathode spray can be ascertained only by testing the as-

sembled tube. These checks, as well as others not mentioned here, are made hourly or daily as required in order properly to control processing and assembly.

Quality Control Laboratory

In order to insure further the uniformity and standardized operating characteristics of Radiotrons, the finished tubes are given further tests in the Quality Control Laboratory. These tests are made and recorded in order to place the responsibility for tube failure in cases where defects were not "noticed" in assembly. For example, should a certain type of tube show an increase in rejections because of gaseous content, the Engineering Department will be aware of this situation immediately upon receipt of the hourly reports made up on individual inspection in the Quality Control Laboratory. By checking back to the exhausting process, sealing, effectiveness of the "getter" and the quality of the glass being used, the cause of the gaseous condition can readily be determined and corrected before any of the defective tubes leave the factory.

The Quality Control Laboratory might be called a double-check on all "spot checks" made during assembly. In addition, it is the germinating spot for methods of improving and developing designs which will result in increased tube efficiency and reduced costs.

The customer, service man and the "ham" operator are interested in knowing the condition of their tubes because tubes control the performance of the device in which they are used.

Life Tests

The operating abilities of a tube are usually indicated and described by its prevailing electrical characteristics. In order to control these characteristics all types of tubes are regularly given what is known as a "life test." This test is made with equipment which will determine the variations in characteristics that take place under normal operating conditions. To more fully insure against variations under normal operating conditions, tubes are placed on "life test racks" for a period of 500 hours and operated under extreme conditions. The tubes are then checked for changes in electrical characteristics and a detailed report compiled.

When the finished tubes have passed the rigid inspection in the Quality Control Laboratory, and before they are packed in sealed cartons, they are again checked in or-

(Continued on Page 6, Column 3)

Widely-Known RCA Officials In New Posts

L. W. Teegarden Now In Charge of National Tube Sales

Recent promotions in the RCA family have shifted to new territories or new jobs a number of RCA sales executives who are widely known among dealers and service engineers.



L. W. Teegarden

Perhaps the most widely-known of the officials who have recently been promoted is L. W. Teegarden, who is known as "Tee" to thousands in every branch of the radio trade. Tee's long experience and familiarity with the problems of radio dealers and service men make him well qualified to direct sales of RCA Radio Tubes. After serving with the sales department of the Edison Mazda Lamp Works for many years, Tee joined the RCA Radiotron Company in 1930. Since then he has established a record of success as district manager of Radiotron sales in the Cleveland and New York offices. Two years ago he was placed in charge of sales of all RCA products in the New York and New England territory. In his new post he makes his headquarters at Camden.

Other promotions of interest to many dealers and service engineers are as follows:

Blakeslee to Camden
M. F. Blakeslee, formerly Manager of the Chicago District, has been appointed Manager of the Eastern Division, with headquarters at Camden, New Jersey.

Richard A. Graver, formerly Manager of the Cleveland District, has been appointed Manager of the Chicago District.

A. G. Kemp, formerly package goods sales representative in Cleveland, has been appointed Manager of the Cleveland District.

E. J. Rising, formerly Manager of the San Francisco District, has been appointed Manager of the Los Angeles District, replacing E. W. Isehower, resigned.

Ed Braddock, well known among amateurs, has been placed in charge of sales of amateur receivers and transmitters. His office is at Camden.

New 50-Watt P. A. Amplifier Is Announced

Expander and Suppressor Circuits Incorporated In New Instrument

Development of a new 50-watt Class "A" amplifier with built-in expander and suppressor circuits to enhance musical reproduction and prevent blasting and overloading in large-scale public address and sound re-enforcement installations has been announced by the Commercial



Voltage Amplifier
Sound Section of the RCA Manufacturing Company.

The new amplifier consists of two units—a voltage amplifier and power amplifier which together,

Catalog



The complete new line of RCA Sound Equipment is shown in this handsome, two-color catalog which is now available from RCA Commercial Sound distributors on request. Be sure to get your copy

Six-Page Ads In "Life" Tell RCA Story

(Continued from Page 1, Column 2)

is actually a magazine within a magazine. Appropriately, the section is called *Listen*. The millions of readers of *Life* cannot fail to see and enjoy these unique advertisements, cannot fail to be impressed with the superiority of RCA Radio Tubes and other RCA products.

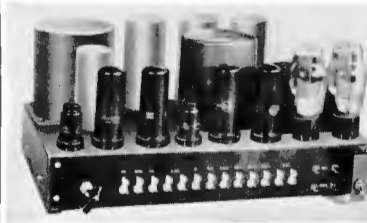
Perhaps never before has an advertiser made his story so entertaining to the reader. *Listen* follows the style of *Life*, telling a story mainly by pictures. Although *Life* is only one year old, the story-in-pictures technique has made the magazine so popular that each issue is sold out soon after it gets on the news stands.

Listen is carefully designed to be just as interesting as the editorial matter of the magazine. Because RCA is the only manufacturer active in every phase of radio, from broadcasting to home reception, there is no dearth of interesting material. And since tubes are the heart of all types of radio apparatus, RCA Radio tubes naturally come in for a good share of attention that will react in favor of dealers who feature the RCA brand.

make up one of the most advanced RCA amplifying systems ever made available for sound re-enforcement work. It is particularly adapted to large outdoor and indoor installations, such as in auditoriums, ballrooms, fairs, ball parks, beach patrols, race tracks and rail and ship terminals. The combined voltage and power amplifier system lists at \$260 F. O. B. Camden, New Jersey.

Remote Mixing

The voltage amplifier unit is of the high-gain type, and incorporates newly designed high level mixing circuits. From one to four power amplifiers can be driven by a



Power Amplifier

single one of the new voltage amplifier. Also, it can be operated in conjunction with RCA's new remote electric mixing system which provides efficient, noiseless mixing of input circuits from any remote point.

The voltage amplifier is highly flexible and ideal for applications requiring high power, especially where multiple mixing positions or remote mixing control, either fixed or portable, may be desired. Space is provided for adding two signal mixing units in addition to the two included in the specifications. For compensating between speech and music pickup, there is a switch for cutting out low frequencies. The expander circuit gives record reproduction a new and lifelike tone.

Jobbers Offer Liberal Deals On Equipment

(Continued from Page 1, Column 4)

with distributors whereby they can design their own deals. "Custom-made deals" is the result with distributors offering deals designed to meet exactly the needs of the individual. In this way the dealer or service man has a much wider choice of free merchandise and gets it on more liberal terms.

Pencil with 60 Tubes

One distributor is giving the very latest type tube checker with an order for only 500 RCA Radio Tubes. Other test equipment is offered on similar terms. The famous RCA Service Engineer's Pencil, with the color-code bands, is given with an order for only 60 tubes. A serviceman's coat is free with an order for 80 tubes.

And so it goes. Ask your RCA Radio Tube distributor about this easy way of getting test equipment and sales promotion material.

VIGILANCE OF LABS GUARDS RCA QUALITY

(Continued from Page 5, Column 5)

der to prevent tubes damaged in storage from being shipped out.

Due to the fact that the radio and its component parts are in a state of continual progress, it is important that exhaustive research and development be made into technical fields in order to find out just what types of electrical designs and devices will do a certain job right.

Although the activities of the Research and Development Laboratories may sometimes overlap, nevertheless the objectives of each may be clearly defined.

In attempting to evolve the possibilities of new types of tubes for transmitting and receiving purposes and to perfect the types now in use, untiring activity along this line often opens up broader fields for extensive research. This aggressiveness often leads to long and tedious experimental research, which the manufacturer interested only in immediate sales would possibly ignore. Yet it is only through the untiring efforts of these departments that our progress is made.

Development Laboratory

In the Development Laboratory trained engineers are busy improving existing types of tubes and the designs of tubes for which there will be a demand in the near future. Here all new developments are worked out, new ideas presented by the Research Laboratory are built into finished tubes for testing purposes, and all new developments carefully checked before being sent to the factory for production. This department occupies the largest section of the Radiotron Laboratory and has its own special factory where all developmental tubes are assembled by the most skilled personnel obtainable.

Research Laboratory

The Research Laboratory is concerned with new ideas in radio tube characteristics and design as well as with basic materials and processes used in manufacture. Very little attention is here given to the present types of tubes. Research activities are usually confined to the physical and chemical sciences.

Commercial Engineering Section

Another important section of the Radiotron Laboratories has as its duties the collection, compilation and distribution of technical data in a clear and concise manner for the use of engineers and service men. This work is done with remarkable efficiency by the Commercial Engineering Section. The engineers of this department handle all technical correspondence with users of RCA Radiotrons and are constantly on the lookout for information which will be interesting and helpful to the technical man.

SELLING TIPS

Selling Tips are our readers' contributions for selling their services or products. All readers of RCA Radio Service News are invited to submit their ideas for increasing business. All Selling Tips printed will win one of the new RCA Service Engineer's Pencils. Let's have yours.

Big Returns

Here is another postcard of my own design. Some of your readers might be interested to know that this card pulls better than my card shown in your September issue. I have received as many as seven calls from 100 of these "What to

made a friend. At the same time that I call on old customers, I inquire of the patient and nurses as to others in the hospital who might want a radio. The results are well worth while.

B. G. May,
R. E. May & Son,
Jacksonville, Ill.

Sells Polish

When a set comes into my shop not only is the radio checked but also the condition of the cabinet. As a result of experiments I have developed a polish that will cover light scratches. Customers frequently ask what I use to restore the appearance of their radios. Now I have a number of customers not only using the polish but sending in their radios more often to be cleaned as well as repaired.

W. G. Hostetter,
4034 Main St.,
Kansas City, Mo.

Tables From Cabinets

We have made a number of interesting tables and stools from old radio cabinets. The top of the cabinet is removed, the center part cut away, and the top replaced on the bottom part with wood screws, making a handsome coffee table or stool for which customers can easily be found.

Ben Wolf,
372 Tremont St.,
Boston, Mass.

Convincing Demonstration

Here is an idea that has increased my tube sales over 20 per cent in the past year: I have two midge radios that are identical except that one has new tubes, the other old tubes. When a customer comes in and complains about noise and static, I let him listen to the two sets. This convinces many of them that regardless of other trouble with the radio, a new set of tubes would help.

Lawrance Fink,
1334 St. Johns Place,
Brooklyn, N. Y.

What to Do When Your Radio Stops

1. See that there is power on the set. If it does not light up then try a table lamp in the socket where the radio plug was.
2. If used, see that aerial and ground are properly connected to set terminals, then check lead-in connection at window-strip.
3. Certain sections of radios have high voltages. Remove power plug before touching any part of it, then see that tubes are firmly in their sockets, and that caps are on certain types.
4. If when set is on any tube gives out noise when tapped gently with a lead pencil then that tube should be discarded.
5. Never turn adjustment screws. These were set at factory and require delicate laboratory apparatus for re-adjustment.
6. If set still doesn't play, it would be best to remove the tubes and bring them in for testing, or phone for home service.

A set that isn't working properly may need re-adjustment. I have the most modern Cathode Ray apparatus for analyzing and re-adjusting radios for better reception. Whenever you want real radio enjoyment just call

McROBERTS HAVEMeyer 9-9851
41-10 49th STREET SUNNYSIDE Long Island City

Do When Your Radio Stops," cards whereas my others, including the one shown previously in Radio Service News, seldom return more than two per 100. I attribute this to the fact that the "What to Do" cards probably are kept while the others are promptly discarded.

James A. McRoberts,
41-10 49th St.,
Long Island City, N. Y.

Prospects in Hospitals

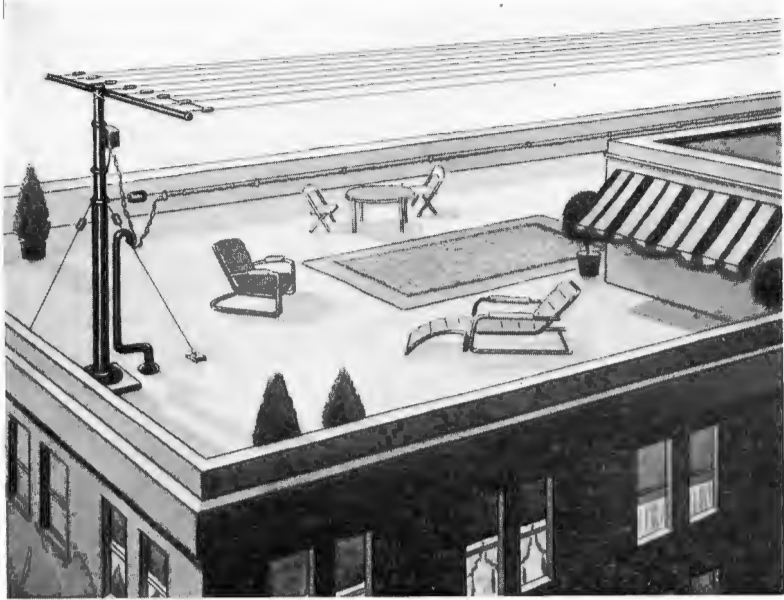
I have found that a sure way of holding old customers and finding new ones is to follow the hospital news. When a customer of mine is in the hospital I rush down and, if the customer is permitted to have a radio in the room, I offer to install a small radio and charge only for the time of installing and removing it. Frequently the customer buys the radio and in any case I have

Wistful Comedian



Beautiful—and wistful—Priscilla Lane is, strangely enough, the comedian of the Lane Sisters Duo. Although she has carved out a separate career for herself, she still appears on the same program with her sister.

A Boon To Apartment Dwellers



At last there is an antenna that will handle the many radio receivers of an apartment house or hotel and give improved reception on both standard broadcast and short-waves. The view above shows how the RCA Multi-Wave Antennaplex eliminates the usual jungle of individual aerials on the roofs of apartment buildings

New Antenna Designed for Big Buildings

(Continued from Page 1, Column 3) will handle up to 16 receivers) will also appreciate the Multi-Wave Antennaplex.

The frequency range of the Multi-Wave Antennaplex is 530 to 18,000 kcs. It has splendid noise-reducing qualities. No price is announced because the specifications and price are variable to meet the requirements of the individual building.

"Results Very Pleasing"

Proof of the efficiency of this new antenna is found in the following excerpt from a letter from H. D. King of the Leo J. Meyberg Company, San Francisco: "An interesting installation of the RCA Multi-Wave Antennaplex was made in the Western Furniture Exchange and Merchandise Mart at San Francisco. The 519 outlets were concentrated mostly on the fourth floor and it is probably the greatest concentration of different styles and types of radio receivers in any equal footage in the world. All of them demonstrated perfectly. Results are very pleasing to everyone."

For further information or prices on specific installations of the Multi-Wave Antennaplex, dealers should communicate with RCA Commercial Sound distributors.

Used at Meetings



W. L. Rothenberger (right), RCA Commercial Sound Sales Manager, and E. C. Cahill, RCA Service Manager, are shown examining some of the equipment that was used for demonstrating purposes at the RCA Technaual Service Meetings now in progress throughout the country. RCA Commercial Sound distributors can give you the date and place of nearest meeting

Tests Prove Worth of Magic Wave Antenna

Wide Adaptability of Aerial Makes It Popular With Dealers

Scientific tests made recently by impartial engineers explain why the RCA Magic Wave Antenna has swept the country in the short time since it was introduced. The tests show that in addition to its ease of installation and adaptability to various locations, the Magic Wave Antenna, when properly installed, is amazingly efficient in reducing noise not only on standard broadcast but also on the short-wave bands.

Marked Improvement

In one case the Magic Wave Antenna was carefully tested in several types of installations by the public utility company of a Pennsylvania town. "The qualitative tests showed a very marked improvement in results when the antenna wire and lead-in to the antenna coupler were remote from the noise field," stated the report.

The ease of installation and adaptability, coupled with splendid performance, have made the Magic Wave Antenna System especially popular with the men who actually

install them.

A useful feature of the Magic Wave Antenna is that it will operate up to 16 receivers at one time without appreciable loss of signal strength. An extra receiver coupling transformer is required for

Mr. Egglemud's Boss



"But, Mrs. Doaks, no service man can make a radio play slower."

each extra receiver.

For a single outlet installation, the price of the remarkable new RCA Magic Wave Antenna is only \$6.95.

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.

First Service Meets Bring Big Turnouts

(Continued from Page 1, Column 1)

band receivers by means of a special slide-rule was commented on favorably. Many other uses of this rule were also explained.

Meetings in other cities will be held in November, as announced in the September issue of Radio Serv-



Bill—Don't tell me I am getting so weak I can't pull a piece of iron off this magnet.

Bob—You aren't getting weak. That's the magnet RCA uses in their new speakers.

ice News. In a few instances the previously-announced dates must be changed. For this reason, unless a further announcement is received confirming the date given in Radio Service News, it is well to inquire of the local RCA Commercial Sound distributor or the local service men's organization as to exact time and place of a meeting.

WE'RE IN THE NAVY

In forwarding the enclosed card requesting that my name be retained upon your mailing list, I would like to make a qualifying statement which might not otherwise come to your attention. It might be felt that those of us in the Naval Service connected with Radio Service Engineering would not be in a field in which your publications would have the potential value wished for. Any such opinion would be erroneous because, if my own case might be taken as a criterion, I wish to inform you that this ship is equipped with every piece of your service equipment excepting that one appearing in your recent issue, and I have every intention of obtaining that at the first opportunity.

Likes the News

I furthermore find your publication very interesting; it has given me several valuable tips in solving certain problems in my work already, keeps me informed of new test and service equipment as it is produced and provides a means of keeping in step with certain phases of the servicing field and broadcasting field, both of which I am very much interested in.

Thanking you for your favor and courtesy of the past and a hope that they may be continued in the future.

H. L. Dawes,
Radio Electrician, U. S. N.
U. S. S. Oklahoma,
Navy Yard, Bremerton, Wash.

What Kind of 1938 Displays Do You Want?

During the current year, more than 5,000 radio dealers and service shops have benefited from the RCA Radiotron 1937 Window Display Service. The window trim shown in the adjacent column is the last of the four major units included in the 1937 Service. Besides the four major units, the Service provided Pictorial News Window Streamers, and various other special services such as World Series Window Score Sheets.

Now RCA Radiotron would like to have dealers themselves design RCA Radiotron's window display service for 1938. All suggestions are welcome. Send your ideas as to how RCA Radiotron can best cooperate with you along this line to Radiotron Advertising Dept., RCA Manufacturing Co., Inc., Camden, New Jersey.

Would you rather have two major units to the service, costing about \$1.75, or would you like again to have four major units costing you \$3 to \$4? Do you like the Pictorial Streamers that are included with Radio Service News? Answers to these and similar questions are the ones RCA advertising men seek from the trade.

New Tube Display



A window display with a kick to it is this striking RCA Radiotron Football display, now going out to subscribers to the 1937 RCA Radiotron Window Display Service. Now RCA Radiotron wants to know what type of displays dealers want for 1938

Test, Test, Test.



Test, test, test at every stage of manufacture is one of the reasons for the dependability of RCA Victor products. Above is shown a long line of chassis test benches in the RCA Victor plant. Note the oscillograph over each bench

Crowning Glory



No wonder audiences flock to the NBC studios in San Francisco. This is Mary Helen Herrick, who is heard frequently on NBC programs originating in the Coast city

Opera Book To Be Printed In Braille System

Blind Persons Will Be Able To Enjoy Famous Victor Publication

The Victor Book of the Opera, which has been a consistent "best-seller" since its introduction, is to be translated into Braille so that its contents will also become available

to the blind, according to a recent announcement by Martha Herman, supervisor of the WPA Braille project at Bismarck, North Dakota. The special edition for the blind, which will expand the 526 pages of the new ninth edition into several large volumes, will also be available in lending libraries.

Sales Reach Half Million

More than 40,000 copies of the ninth edition of the Victor Opera book have already been sold in a little over six months, which establishes a record for this type of non-fiction volume. RCA Victor record dealers are reporting a new surge of public interest in the book as the Fall music season approaches and it is expected that a new sales record will be established. Approximately half a million copies have been sold since the first edition was issued in 1912 by the old Victor Company.

An Inventory Aid



Not content with merely designing a tube carton that catches the customer's eye in the store and protects him by its seal, RCA Radiotron package designers added an extra feature for the convenience of the retailer. Have you noticed the little perforated tabs at the top of each carton? These make it easy to keep inventory records, and to make up "want" lists. Whenever you sell a tube, whether from the store or from a service kit in the customer's home, just tear out and keep the little tab. When ready to take inventory, sort out the tabs, deduct the number of tabs of each type from original inventory, and you are then ready to make up your order, even though your tube stock itself may be in several different places

OVERCOMES HANDICAPS

Having your troubles? If so, don't let 'em get you down. M. L. Grigsby, crippled radio dealer of Granger, Ia., didn't:

Because of his physical handicaps, Grigsby was never able to attend school, to walk, or to write. Nevertheless, with the help of his mother and grandmother he learned to read and acquired a good education, and finally established a business selling magazine subscriptions. Radio was of so much help to Grigsby in his efforts to acquire an education that he became interested in radio as a business. Today in addition to selling magazines he sells RCA Victor Radios from his wheel chair.

Tube Thumpers News Issued By Nashville Assoc.

Radio Service Magazine With Unique Name Is Well Edited

Not the most elaborate of service publications, but certainly one of the most distinguished so far as its name is concerned, is *The Tube Thumpers News*, official organ of the recently re-organized Association of Radio Service Engineers of Nashville, Tenn.

RCA Radio Service News, best-read and with the largest circulation of all radio service publications, salutes the newcomer and hopes that the association will prosper.

Although the members of the Nashville Association adopted a humorous name for their publication, they take themselves seriously in its editorial content. Sound, constructive thinking marks the editorials and articles, as the "Resolutions" reprinted below indicates.

Officers of the Nashville Association are A. N. Archie, president; Robert F. DuBose, vice president; Robert Hudson, secretary and treasurer.

RESOLUTIONS

Although these New Year's resolutions were penned by Mr. Sarnoff in 1923, they are just as applicable today as they were when written, and perhaps it is not too far along in 1937 for some of us to see if we might not with advantage take a few of them to heart:

1. Adapt yourself to circumstances, but don't lose character and purpose.
2. Be frank, but not blunt.
3. Be courageous, but not defiant.
4. Work hard, but consistently and not in spots.
5. Specialize and master some one thing, but don't narrow yourself and lose perspective.
6. Cultivate the power of expression in writing and speaking, but don't be verbose.
7. Separate the fundamentals from the details and summarize for action, but don't ignore the details.
8. Have faith in mankind and self-confidence, but do not be gullible or conceited.
9. Be democratic with your business and personal associates, but not to the point of breeding contempt or disrespect.
10. Visualize and plan ahead, but not so far ahead as to overlook the immediate future.

—from *The Tube Thumpers*.

SHOP NOTES

FROM RCA SERVICE DIVISION

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

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

ELECTRIC TUNING MECHANISMS

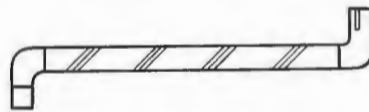
The electric tuning mechanisms of Models 811-K, 812-K, and U-109 are designed to be as simple in construction and as fool-proof in operation as is possible. In order to maintain the accurate results possible with these devices, servicemen should use intelligent precaution in effecting any repairs or adjustments that may be necessary in the field. The suggestions below are continued from our September issue.

The larger tuning knob of the Electric Tuning models should not be allowed to rub against the cabinet or bind with the inner knob. This may be avoided by careful installation of the knobs and instruction of the customer. A bind at this point will cause abnormal mechanical noise and may be enough to cause the drive motor to chatter in and out of mesh.

Binding of the lever to which the throw-out gear is attached may occur at the bearing on the tuning shaft assembly, causing the throw-out gear to slip or jump in and out of engagement. The bearing of the lever should be carefully washed out with Carbona or equivalent, and re-oiled plentifully. Work the lever back and forth while cleaning and oiling so that any foreign particles will be removed.

Arcing at the insulating segments of the selector discs will produce a bad interference during "Electric" tuning but which will not be present during "Manual" tuning. The condition will in most cases be due to an accumulation of metallic dust, or graphite grease on the discs. Thorough cleaning of the discs with a cloth and cleaning fluid, polishing with crocus cloth and careful re-lubrication will eliminate the trouble. Only a very slight film of Vaseline or Petrolatum is necessary on the discs. It is best to dampen a cloth with the lubricant and then apply it sparingly.

The tension of the long finger on the short-circuiting switch should not be overlooked in adjusting the mechanism to eliminate poor pull-in or dis-engagement of the motor. This tension becomes somewhat critical with low line voltages; the



RELAY BENDING TOOL

lower the voltage, the less should be the tension of the switch finger against the rotor shaft. A relay bending tool equivalent to the Automatic Electric Company, Chicago, Illinois, U. S. A. "Tool No. 7066" will be found handy in bending the fingers of the switch for proper adjustment.

Packing supports for the Electric Tuning mechanism and chassis must be kept intact when the instrument is re-shipped or handled during local delivery or return. The rear packing rail which secures the chassis rigid with the cabinet is carefully fitted at the factory, through use of variable size spacer blocks, to prevent movement of the chassis when the bolts are made tight. This same caution should be exercised in the field, as heavy jolts may affect adjustments of the tuning assembly.

Slippage of the vernier tuning control at the ends of the dial may be caused by torque required to actuate the reversing switch on the back of the selector disc assembly. The customer should be instructed to use the larger tuning knob to carry the mechanism over the reversing point. This condition occurs only on "Manual" operation and only at ends of the scale.

Motor Alignment

The motor shaft must be exactly aligned with the axis of the pinion gear with which it engages. This may be adjusted by loosening the mounting screws of the motor and aligning the shaft by sight. Correct

alignment may be tested by slowly rotating the motor and observing the mesh between the pin of the motor shaft and the pawl on the pinion. The relation of the two should remain the same throughout the revolution.

Automatic Frequency Control

The AFC of the new line "Electric Tuning" receivers is operative only when the set is being used in the electric or remote positions of the changeover switch. The use of AFC with manual tuning makes for sluggish operation and causes unfavorable reaction due to apparent broadness. It is much preferred that hand or manual tuning be accomplished, as on the new RCA receivers, through use of the Magic Eye as an indicator.

Ordinarily, stations separated by 10 KC may be set up and tuned electrically. It is not very wise, however, to attempt to set up a weak station for electric tuning on a channel adjacent to a strong station, unless the station is of sufficient strength to actuate the AFC.

Short Wave Instability—Model 85T1

Unstable performance at the high frequency end of "C" band may be due to super-regenerative action in the oscillator-detector circuits. Careful realignment of the "C" band circuits will correct most cases of this trouble; however, it may be necessary to replace the oscillator-resistor R-2. This resistor should have 33,000 ohms resistance. The "C" band circuits must be aligned at 15,000 Kc, with the heterodyne oscillator stage tracking 460 Kc below the signal frequency.

Magic Wave Antenna

The length of the grounding lead of the antenna transformer is very important and it should be maintained as short as possible on all installations. Approximately five feet of ground lead (yellow) is supplied in the antenna kit. This should be cut down to the minimum length required for making a solid ground. Extension of this lead should be avoided. It will generally be found better to lower the elevation of one end of the antenna to obtain a short ground connection rather than increasing the length of the ground lead to gain elevation. Antenna locations should, therefore, be chosen with consideration of remoteness from noise sources and facility of obtaining a short transformer ground.

In using less than four receivers on the stock #9814 branch transformer, the unused output terminals should be left open-circuited and should not be loaded nor connected to a line.

Lightning arrestors are not supplied with the new RCA Magic Wave Antenna kit. Where they are required by local ordinance, or if installation is desired for other reason, the doublet type, or two arrestors, should be used. An arrestor arrangement should be connected between each side of the transmission line and ground at the point where the line enters the building.

Service Note Corrections

Model 5T1, Page 3, Figure 3—Resistance of high voltage winding should be 760 ohms, total.

Model R-99—Input transformer resistances are shown incorrectly in schematics and wiring diagrams. Primary resistance should be 10 ohms and the secondary resistance 6750 ohms.

Magic Wave Antenna Instruction Sheet—The correct identification of the Receiver Transformer is Stock #9813.