



RADIO SERVICE NEWS

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

APRIL 5, 1935

CAMDEN, NEW JERSEY

Vol. I, No. 8

OSCILLOGRAPH AIDS ARE READY

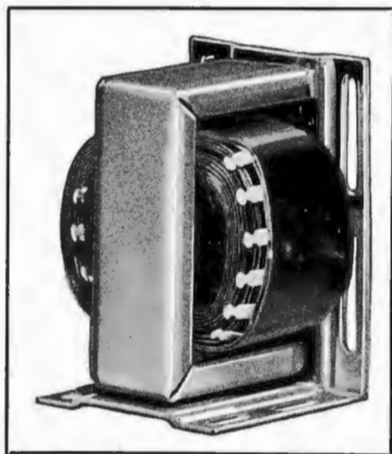
ANNOUNCE TWO AUDIO OUTPUT TRANSFORMERS

Universal Output Transformers Used With All Tubes and Speakers

Two new output transformers, identical except for mounting and impregnation, were recently shown at a meeting of RCA Service Engineers in Camden, N. J. According to G. P. Allen, of the RCA Parts Division, these transformers permit service shops and Service Men to carry a stock of only one output transformer which may be used with any radio receiver having a dynamic-type loudspeaker. The surprisingly low price of these transformers, together with their rugged construction, will insure their ready acceptance by all service engineers, according to Allen.

Special Unit for Moist Climate

Both transformers are identical except for mounting arrangements. The Stock No. 7852 Transformer, which has



The RCA Universal Transformer in standard impregnated model sells for only \$1.95

a list price of \$1.95, has the usual open-core brackets which are suitable for mounting on loudspeaker or chassis frames. A baked varnish impregnation insures excellent performance in the usual temperate climates.

The Stock No. 7853 Transformer, which has a list price of \$2.42, is vacuum-impregnated in a cadmium-plated metal can, having a bakelite terminal board at its top. While not quite as handy in mounting, the special impregnation insures trouble-free performance under tropical climatic conditions.

Known Trade Mark Helps Sales

RCA Parts Distributors now have these transformers in stock and are prepared to make immediate delivery. The low net cost insures service profits and the RCA trade mark, with its prestige and assurance of quality, will convince the customer that the service engineer used the best possible materials.

PENCIL OFFER EXPIRES

SEE COL. 2—PAGE 4

Bring On Television!



When television arrives it will hold no terrors for Jane Froman, popular NBC performer. Her crooning contralto voice has already made her a favorite with thousands of radio listeners and if television were already here she would be a real sales stimulator for radio service engineers because no one would want to miss seeing her. At present she is one of the stars on the Paul Whiteman program.

NEW \$34.50 OSCILLATOR HAS FEATURES OF SIGNAL GENERATOR

Frequency Modulator and New Test Oscillator Are Designed for Use With RCA Oscillograph

FREQUENCY MODULATOR SHOWS R-F AND I-F CURVES ON OSCILLOGRAPH

Announcement by the RCA Parts Division of the new Stock No. 9558 Frequency Modulator completes the equipment necessary for visual r-f and i-f alignment of radio receivers with the sensational RCA Cathode-Ray Oscillograph. It enables the owner of a Cathode-Ray Oscillograph to add an additional important feature that is particularly important in radio service work. The net price to service men is \$27.50.

The new instrument consists of a motor-driven tuning capacitor of two ranges, an a-c synchronizing generator driven from the same shaft, and a low-capacity coupling cable. The entire rotating mechanism is enclosed in a small aluminum case, finished in black wrinkle lacquer and fitted with a leather handle.

Varying R-F Frequency Required

"For visual alignment of r-f and i-f circuits in superheterodyne radio receivers with an oscillograph, it is necessary to have an r-f signal of varying frequency connected to the circuit under test and to generate an a-c synchronizing voltage simultaneously with such frequency variation," explained W. F. Diehl, RCA Victor engineer, in commenting on the RCA frequency modulator.

The three conditions necessary for visual alignment, according to Diehl, are:

1. The unmodulated r-f signal frequency variation must slightly exceed the resonant frequency of the circuit under test.

(Continued on page 3, column 1)

IMPROVED RCA OSCILLATOR HAS MAGIC BRAIN TYPE COIL ASSEMBLY

No longer must service engineers content themselves with a Test Oscillator having high leakage, poor calibration, unsymmetrical modulation or any of the usual undesirable features of most oscillators. A new RCA Test Oscillator, priced at only \$34.50 net to service engineers, overcomes these and all other features heretofore considered unavoidable in instruments of this type. While this new instrument retains the general appearance of its predecessors, its performance and flexibility have been improved to the point where it definitely gives laboratory type performance.

Copper Shielded Coil Unit

A newly-developed copper-shielded coil assembly gives an output which may be adjusted from less than 1 microvolt to over 0.2 volts over the frequency range from 90 to 1500 kc. At higher frequencies the maximum output is slightly less while the minimum is somewhat higher. At 25,000 kc., it is less than 40 microvolts. Provision for oscillograph operation, external modulation, and operation as a heterodyne frequency meter are but few of the many new features of this remarkable instrument.

Again RCA has placed in the hands of service engineers an instrument that permits them to offer factory type

(Continued on page 6, column 2)

SILK PURSES, SOWS' EARS, AND LICENSES

An Editorial by F. B. Ostman

Service Manager, RCA Victor Division

Greetings, radio service engineers.

E. M. Hartley, he whose editorials formerly occupied this space having been chosen for another position within the RCA family, I welcome the opportunity to talk to you in these columns.

This, my first venture as a columnist, might frighten me were it not that I feel I am talking to friends. I have a right to feel that radio service men are my friends. I have known them intimately for many years.

* * * * *

It is a far cry from the odd service jobs I did when operating my amateur station in 1922 to my office at "Radio Headquarters" today. But I find that the problems of the radio service profession are little different.

You today have some problems I did not have then, simply because then the industry was smaller. One of the problems before the radio service profession today is whether or not to license its members.

* * * * *

The danger is not that we shall license or not license, but that we shall expect licensing to solve our problems, to do what it cannot do.

Licensing may help, but it cannot make a silk purse out of a sow's ear. Regardless of the requirements for obtaining a license, the incompetents and the "gyps" will still get theirs. They always do.

What they cannot get is the following that comes from a reputation for honesty and reliability. That can come only from doing good work and selling good merchandise. That is what RCA purposes to help you do.



F. B. Ostman

LOW PRICE ON HIGH QUALITY SOUND SYSTEM

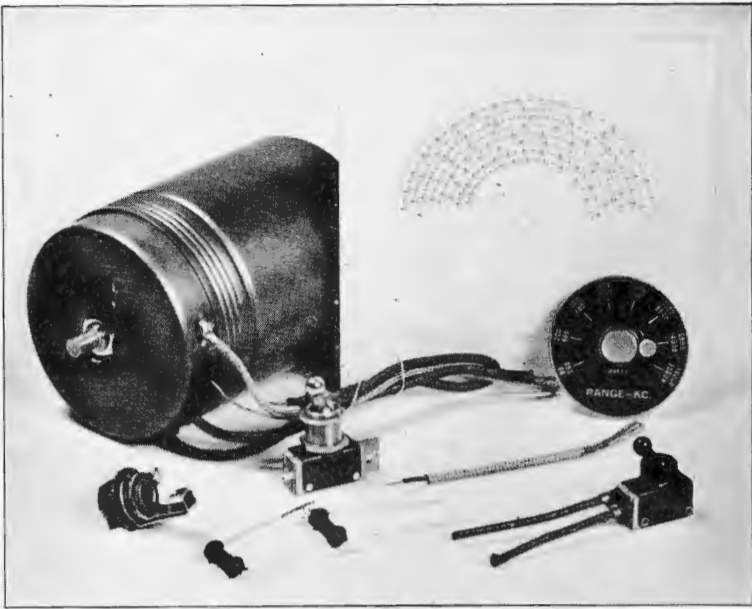
New PA Equipment Opens Huge Low Price Market to Service Engineers

Good news for aggressive service men is contained in the announcement of a new low-priced RCA Victor portable public address system recently presented to the trade. Model PG-63B, as it will be known, has unusually good tone quality obtained through the use of an efficient 6-watt amplifier and a ten-inch dynamic speaker. Its price of \$79.50 complete will go far towards making this new equipment a "best seller" for service engineers who have been asking for P.A. equipment they could stand back of and yet sell it to the low-price market.

Those who have heard this new equipment in operation acclaim its remarkable tone quality, and marvel at the efficiency of the loudspeaker, which handles without distortion the

(Continued on page 3, column 3)

Modernize Your Oscillator



RCA Parts Division has prepared a Modernization Kit by which owners can build low-leakage, wide-range, and adaptability to use with an oscillograph into the older model RCA Test Oscillators.

KIT OF PARTS IMPROVES OLD OSCILLATORS

New Low-Priced Kit Makes RCA Oscillators Equal to Many Signal Generators

Extremely low leakage and high output are two new features that any service engineer can now add to his RCA Test Oscillator, either Type TMV-97-A or TMV-97-B, by means of a Modernization Kit recently announced by the RCA Parts Division. Through the co-operation of RCA Parts Distributors, the Kit is offered for only \$4.75, little more than manufacturing cost, so that owners of either of the older type RCA Oscillators can have equipment of the very latest type at minimum expense.

Miniature Magic Brain

The heart of the improved test oscillator kit is the shielded coil and switch assembly, similar to the famous RCA Victor MAGIC BRAIN. This unit includes eight coils and an eight-position rotary switch, all compactly mounted in a drawn copper container. High efficiency and low leakage gives an output r-f voltage adjustable over a wide range.

90 K.C.—25,000 K.C.

The frequency range of the modernized oscillator is from 90 kc. to 25,000 kc. by means of eight individual overlapping ranges. The entire range is covered by the fundamental frequency of the oscillator, no harmonics being used. The eight-position range switch and the tuning dial are marked directly in kilocycles. Thus accurate dial and switch settings for a given frequency are easily and quickly made. The accuracy of dial calibration is 3%.

Modulation Control

A separate tube is included in all RCA Test Oscillators for providing a 400-cycle modulation frequency. Certain applications, notably those with the RCA Cathode Ray Oscillograph, require an unmodulated output. To provide for this contingency, a two-position toggle

switch, mounted on the panel, permits operation either with or without modulation.

Sweep Circuit Jack

When using a test oscillator for aligning r-f or i-f stages in conjunction with the RCA Cathode Ray Oscillograph, it is necessary to parallel a sweep capacitor across the tank capacitor of the test oscillator. To facilitate this connection a jack is provided for mounting on the front panel, thus permitting use of the low-capacity cable furnished with the RCA Frequency Modulator for this application.

R.F. Output Voltages

A two-position toggle switch combined with a new variable attenuator circuit provides two ranges of output r-f voltages. The switch gives approximately a 100:1 ratio of voltage change. The minimum range of the high position overlaps the maximum range of the low position, thereby giving a continuous variation over the entire range.

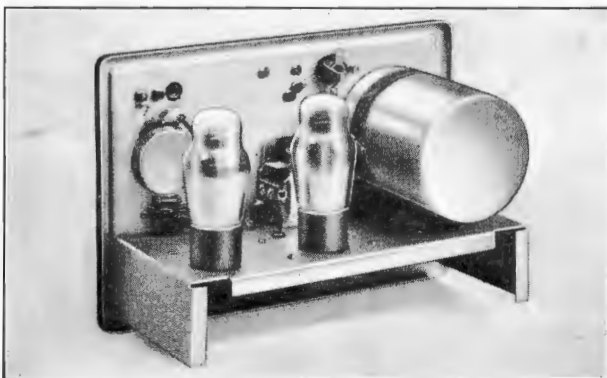
DIVIDENDS PAID ON PREFERRED SHARES BY RCA

Thriving Condition of Business Demonstrated by Payment of Arrears on Preferred Stock

Dealers and service engineers who have teamed up with RCA and RCA products can have the assurance that they are associated with a thriving aggressive concern. Dividends covering all arrears on the "A" Preferred Stock of the Radio Corporation of America were declared at a meeting of the Board of Directors on January 18th, according to an announcement by David Sarnoff, President of the Corporation.

\$4,520,000 in Dividends

"Dividends on the 'A' Preferred stock of RCA have not been paid since the first quarter of 1932," said Sarnoff. The action of the Directors today provides for the payment in full of all arrears on this class of stock for the period April 1, 1932, to December 31, 1934. The total amount which will be paid in dividends to 'A' Preferred stockholders is approximately \$4,520,000."



Shielded Coil Assembly gives neat appearance to modernized RCA Test Oscillators.

OSCILLOGRAPH CLEARS SHELF OF "HEADACHES" SAYS OWNER

Pennsylvania Man Reports RCA Oscillograph Cuts Time for Repairs at Least 50 per cent and Discloses Trouble on Difficult Jobs

"The greatest aid yet offered to service men," is the description applied to the RCA Cathode Ray Oscillograph by Dan P. Davis, prominent radio service engineer of Kingston, Pennsylvania, who employs several other men in his shop and is known for the completeness of his equipment and his aggressive business methods. He purchased one of the new RCA Oscillographs, which sell for \$84.50, as soon as they were announced. Two weeks later, when K. E. West, RCA Parts Division representative, called on Davis, the Kingston radio expert was so enthusiastic about the results from his new service instrument that West suggested Davis tell others of the profession about it in RCA RADIO SERVICE NEWS.

"The development of the Cathode Ray Oscillograph as an instrument for use in radio service is, I believe, the greatest aid yet offered to service men," wrote the Kingston radio expert.

"In the short space of time that I have had this instrument, I have found the oscillograph of great aid in solving difficult servicing problems, and also in the improvement of the over-all performance of the older type radio as well as the present-day sets.

Interesting Uses of Oscillograph

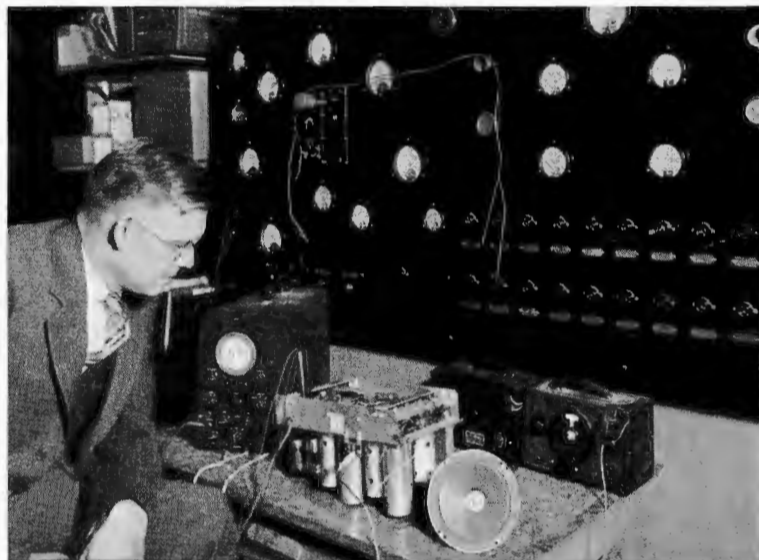
"Some of my experiences have been interesting to follow. I had a G. M. radio on my bench to be repaired because the set would drop off in volume, what we commonly call a "cut-off" job, the cure for which is generally the re-

placement of one of the three-tenth mfd. condenser blocks. Applying the oscillograph to the output of the detector tube, we discovered that the machine was not cutting off. Then by connecting the oscillograph to the output of the first audio tube, an intermittent cut-off appeared. This immediately showed us the trouble to be in the audio circuit rather than the general idea of its being in the r-f circuit.

"We have also, by use of the instrument on cut-off jobs, found output transformers which would intermittently open.

A Definite Shop Procedure

"With these results in mind, I have re-arranged my shop and now have a definite system when servicing any radio. We have set up a test and analysis



Locating hum in a receiver is no problem to Dan P. Davis since he acquired an RCA Oscillograph. In the above unretouched photograph he is looking at the ripple voltage on the output of a receiver.

table where all radio chassis must clear through before they are worked on, unless, of course, there is some obvious trouble as a burned-up transformer or damaged cone. The Cathode Ray Oscillograph is the first instrument applied to the chassis and the trouble is very quickly run down and isolated. Then this particular part is checked thoroughly with the oscillograph and other pieces of test equipment. When the chassis is repaired, it again goes to the test table and is checked thoroughly for the correction made and any other trouble not evident before is also corrected.

Easy Alignment of Flat-Top I.F.

"Another interesting use we made of the oscillograph was the aligning of the i-f transformers of an RCA 80. This set, as you know, has a flat top alignment, the curve of which is very definitely shown by the oscillograph.

"I have also been able very quickly to determine what part of the filter circuit filter condensers are open, causing hum in the receiver. Overloading of the speakers has been very speedily discovered and rectified by connecting the oscillograph to the various audio circuits in the receivers.

"These are a few of the practical applications I have made of the instrument as far as radio circuits and their troubles are concerned.

"Another handy phase of the adaptability of the instrument is in the checking of tubes. This I do with sets using the multi-purpose tube. It would be needless to mention the importance of the alignment of the i-f transformers with respect to the improvement of the quality of the receiver since we all know that this really is the one phase of the work which determines whether or not the receiver performs. The oscillograph cannot be surpassed in the alignment of these i-f transformers."

trouble have all been returned to their owners repaired and in A-1 shape.

Gives Advertising Advantage

"Another angle to having the Cathode Ray Oscillograph in my shop is that it affords me a great advantage in advertising and gives me something to talk about and place before the public. Since advertising the oscillograph on the doors of my delivery truck, my customers have shown a keen interest in knowing what it is all about. Also I have been asked to give a practical demonstration on the fundamental principles of electricity before the local high-school science classes. I have accepted the invitation and at present I am busy making phase shifters, and various types of power loads for my demonstration, and am learning, or should I say re-learning, just what does happen in the different types of simple circuits.

"The Cathode Ray Oscillograph, as I mentioned before, has actually put new interest in the radio service man's work. Instead of looking forward to a day of routine test, which is usually cut and try, you are eager to try a stubborn set."

EXPLAIN NEW AUTO RADIOS AT MEETINGS

RCA Victor Magic Brain Auto Radios Explained with Cathode-Ray Demonstrations

Another series of servicemen's meetings sponsored by the RCA Parts and Service Division in collaboration with RCA Parts Distributors, will be held during March and the early part of April until more than 150 towns and cities in all sections of the country have been covered, according to an announcement by Mr. F. B. Ostman, Manager.

Following closely a successful series of servicemen's meetings on antenna systems, the new series will be devoted to an analysis and study of the newest RCA Victor auto radio receivers, which incorporate a number of important improvements in design and construction. Another interesting feature of the programs will be a description and display of a remarkable new automobile antenna system which RCA Victor engineers have designed to meet the problems of providing noise-free reception in the new, steel, turret-type auto tops. The new RCA Victor auto radio receivers, which will shortly be announced to the trade, will be demonstrated to the radio technicians and their circuits analyzed with the aid of the RCA Cathode-Ray Oscillograph.

The exact time and place for the meetings may be obtained from the nearest RCA Parts Distributor. All dealers and service engineers are invited to attend. An entertaining program of sound motion-pictures, which has been a popular feature of previous meetings of this type, will be included in the new series.

Free Tube Clips

With the compliments of the RCA Radiotron Division, service engineers can now get a supply of potent tube-sales builders free—the RCA Radiotron Spare Tube Clips.

They are easily attached to the inside wall of the receiver cabinet, providing a safe place for spare tubes and helping you to make extra tube sales. Very useful for holding tubes above the service bench or in the display case or window.

They are absolutely free, no strings attached. Just write to RCA Radiotron Division, 589 E. Illinois St., Chicago, Ill., and say "I want some of those tube clips."

Truck Advertises Oscillograph



Dan P. Davis, of Kingston, Pa., finds that ownership of an RCA Oscillograph is a distinct advertising advantage. He tells people on the door of his truck about his modern method of servicing.

NEW FREQUENCY MODULATOR FOR OSCILLOGRAPH USE

(Continued from page 1, column 4)

2. The variation of this unmodulated r-f signal must be at a greater rate than that discernible to the eye so that a flicker will not result.

3. The r-f oscillator sweeping frequency must be synchronized with the horizontal "saw-tooth" sweeping frequency of the oscillograph.

The RCA Frequency Modulator and a test oscillator, such as RCA Test Oscillator, Stock No. 9050, satisfy these three conditions.

The frequency modulator is connected to the test oscillator by means of the low-capacity shielded cable furnished. The output of the test oscillator is then fed to the input of the stage being aligned or under test. The oscillograph vertical deflecting plates are then connected to the output of the detector. The output of the synchronizing generator is then applied to the horizontal saw-tooth oscillator. So connected, the over-all curve of the circuit under test will be projected on the screen of the Cathode-Ray Tube.

The specifications of the instrument follow:

Tuning Capacitor—Two sections—one 15 mmfd., and one 30 mmfd. Panel switch for selection of desired value. The sweep capacitor rotor is divided into two equal sections, which are mounted 180 degrees apart on the shaft, thereby giving a perfect balance at all angles of rotation.

Connecting Cable—14-inch, low-capacity connecting cable with plugs at each end.

Generator Frequency—Two cycles per revolution permit positive synchronizing for double-sweep alignment.

Generator Voltage—1.5 volts minimum.

Generator Wave-Form—The output of the impulse generator has a very peaked wave-form instead of the usual sine wave of a-c generators. Such a wave-form gives a very positive means of

Restaurant Uses P. A. System for Fast Service



The Franklin Cafeteria of Hartford, Conn., speeds its service to customers through the use of an RCA PG-63 Public Address System operated with three carbon microphones. Microphones placed on the counter permit attendants to pass orders to the kitchen through the use of a loudspeaker and amplifier.

synchronizing the horizontal "saw-tooth" oscillator of the cathode-ray oscillograph with the output of the receiver under test.

Motor—Repulsion induction type—1550 r.p.m.—sweep speed—25 per second in each direction.

Panel Controls—"Hi-Lo" capacity switch, "On-Off" switch, output binding posts and single-circuit jack.

Size—Height 8½ inches (including raised handle), case alone 6½ inches, width 9¼ inches, depth 4½ inches.

LOW PRICE ON HIGH QUALITY SOUND SYSTEM

(Continued from page 1, column 5)

maximum output of the amplifier, conservatively rated at six watts. The unit is capable of amplifying and reproducing not only speech but music as well, by means of separate portable phonograph turntables, available as auxiliary equipment.

Unusually Simple Controls

Model PG-63B is assembled in a handsome, sturdy carrying case, that holds microphone, amplifier, speaker and necessary connecting cables. The equipment and controls have been so designed that actual operation of the complete unit is as simple, convenient and foolproof as an ordinary radio receiver, permitting it to be safely handled and operated by the layman.

This new model can be unpacked and set up in operation in less than a minute and no additional apparatus or wiring is required for its use at any location. Just three connections—microphone, speaker, current supply—and the equipment is ready to go into action.

Outstanding Features

The new instrument consists essentially of a high-gain 6-watt amplifier, operating on 50-60 cycles, 110 volts, A.C., a 10-inch electro-dynamic loudspeaker, and a close-talking carbon microphone. A tone control, combined volume and power switch, and phonograph jack, with necessary microphone and speaker cables complete the equipment of this new model.

Music Background for Voice

Model PG-63B may be used for record reproduction, by connecting it with a portable RCA Victor phonograph attachment, available with single or double turntables.

An unusual feature of this equipment is its ability to reproduce voice with musical background. The music may be faded into or out of the announcement with a very pleasing effect. This feature is particularly useful when occasional announcements are to be made during a recorded musical program.

Numerous Prospects

The market for a low-priced system of this type is practically unlimited. Prospects can be found in the most unexpected places. Frequently for instance, progressive restaurant owners have seized on this equipment as modern means of communicating between counter and kitchen.

For full information, service men should write to their local RCA Victor instrument distributor, or in some cities to the RCA Victor Commercial Sound distributor. If more convenient, inquiries may be addressed to Commercial Sound Sales, RCA Manufacturing Company, Inc., Camden, N. J., and complete information will be mailed promptly.

ASSOCIATION IS ACTIVE AGAINST FILTER RACKET

Sale of Questionable Parts on Street Stopped by Service Men

"Action, not words" is the slogan of the officers of the Philadelphia Radio Service Men's Association. When they see something wrong in the business they do something about it—and they get results, as the seller of an alleged phony "Electro Radio Control" device on the streets of Philadelphia knows to his sorrow.

Three members of the Association were particularly active in pushing the case against the man, who found quite a market among the gullible passersby for his device. They were: A. H. Prow, Joseph Bishop and F. A. P. Ziesmer, who say their interest in better ethics in the radio business has been stimulated by articles in RCA RADIO SERVICE NEWS. They purchased

NEW FEATURES ADDED TO RCA SERVICE NOTES

Opposite Pages Used for Schematic and Wiring Diagrams

Recent issues of Service Notes by the Publication Section of the RCA Parts and Service Division have included several changes from the general style used for the last several years. Placing the schematic and wiring diagrams on opposite pages so that page turning is eliminated when checking from one diagram to the other, is a great help when checking complicated circuits for sources of difficulty. Other improvements are the inclusion of simple socket voltage layouts and more detailed description of circuit diagrams.

Wide Distribution

Service Notes on all RCA models are widely distributed by all RCA Victor and RCA Parts Distributors. All service engineers should see that their distributor keeps them regularly supplied with Service Notes on all new models. The booklets are very valuable to the service engineer and include complete service data, diagrams, voltage readings and replacement parts lists for all models.

Bound Volumes Available

For the benefit of the service engineers who desire Service Notes in a handy and permanent form, complete bound volumes are available at the low-cost price of \$1.00 per volume (f.o.b. Camden, New Jersey). The books give complete information on all RCA, RCA Victor and Victor Talking Machine Co. models having radio receivers. There are five volumes in all, as follows: 1923-28, 1929-30, 1931-32, 1933 and 1934. Thus for the small sum of \$5.00 a complete library of all the technical information on all RCA models, both past and present, may be obtained.

one of the devices, examined it, and then gave their findings to the Better Business Bureau in a letter which took up and denied one by one the claims made by the manufacturer—all except the "one year unconditional guarantee," to which their letter replied, "Unquestionably true, as there is nothing in the device to get out of order, and, judging from the general make-up, they could replace each unit five times a year and still make a profit."

Indictment Returned

The seller was arrested, and brought before a magistrate. Bonds were set at \$300 pending trial. On March 15th, a true bill of indictment was returned by a grand jury.

The Voice of Radio Service

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

Favors Licensing



Thos. A. Pilling

Three vital factors must be considered in combating the service racketeer. First, we must be licensed in order to reduce to a competent minimum the total number of service men. The doctor, the electrician,

the projectionist and the plumber, all of whom are responsible factors in daily affairs of life, have seen the wisdom of such a move.

Secondly, the free service plan must be eliminated. As an inducement, which is both logical and practical, and which offers to the client an even break, is the one offered as follows. The customer should have the choice and be treated fairly in return for accepting a condition as illustrated.

Inspection with Tube Purchase

We have offered with the purchase, by the customer, of three or more RCA tubes, regardless of type, an inspection, without the customer being obligated other than the purchase of the tubes. He also has the privilege, should he not require tubes, and the work is of minor nature, of paying \$1.00 plus parts. This service charge is not added on after completion of job, but is charged as part of the time applied to the job.

Thirdly, as long as mail order houses and so-called wholesale houses will cater to "John Public" at the same net price as to the legitimate service agent, where can we expect the said "John Public" to pay us a legitimate profit on the part, when he can pull a catalogue from his rear pants pocket and tell us how much we pay for it.

Some idealists in the profession believe that "John Public" will be generous enough to personally add on to a price for which he knows he can buy the article in the open market, a profit, even though he feels that we are making a profit, exclusive of the part. Tube companies have asked for larger sales, when we can't honestly sell more than a certain number of tubes.

We stand by the line, to endeavor to play ball, if the team gets together.

To "Our Profession," one of the finest! Thomas A. Pilling
Bronx Radio & Television Co.
409 E. Gun Hill Road
New York City

Analyzes Costs

Mr. E. T. Cunningham
201 N. Front Street
Camden, N. J.

Your pamphlet entitled "The Truth about Radio Tube Prices" received, read and appreciated.

I have been in the service game since 1922 and like other service men thought at first that if the charges were so much per hour on each set I could make out. Only within the last year, however, have I come to any real definite conclusions concerning a profit for myself, and this is how I have done it:

Interest on investment.....	\$204.00
Electric.....	72.00
Phone.....	144.00
Car at .10 per mile.....	400.00
Rent.....	240.00
Wages at \$35.00 per week....	1,820.00
Total.....	\$2,880.00

Of the type of work I get (when others can't, I do) mostly it is possible to complete on an average only two sets per day or 600 sets per year. When you figure that up that makes an average of \$4.80 per set, and if I do not get that I am the loser. As soon as the ordinary service man gets to understand that, the better off he will be.

I am an independent certified radio-technician, have no other help and am kept busy almost 99 per cent of my time and know what I am talking about.

A flat rate charge is the easiest way out and in that way no one pays too much and no one pays too little.

Ordinarily I do not write letters of this nature: but, the service situation is ?c—0—, etc. Servicing radios is a highly specialized work and the sooner the service man learns that the better for all concerned.

If you have read this far, I hope it will help some other poor "buggar" who is trying to figure a profit and can't.

Most service men do not know how to figure, I find.

R. W. Hoffman,
Chadds Ford, Pa.

A Wonderful Time Saver, Says Keller



F. A. P. Ziesmer (right) explains the new RCA Oscillograph to P. A. Keller.

"I've tried to keep my shop up to date," said Paul A. Keller, of Keller Radio Service Co., 13th and Lehigh Ave., Philadelphia, when interviewed about his experience with the new RCA Cathode Ray Oscillograph.

"In the old days I purchased Weston meters and built my first analyzer; then a few years later I bought a single meter analyzer, the double, triple, and finally a nine meter panel, then the new volt-ohm meter and point-to-point analyzer. Then I bought the RCA Test Oscillator. Each was a great help.

"Recently I acquired the best instrument of them all, the new RCA

Oscillograph. The thrill of the volt-ohmmeter in comparison to earphones and a dry battery method had nothing on this newest development. The old saying that 'seeing is believing' has come true for radio service. I have found it a wonderful help and time saver. Its possibilities are far-reaching and practically unlimited, for each day you can find a new and startling application."

The above view was taken as Keller was being introduced to his new service instrument by F. A. P. Ziesmer, Service Manager for Raymond Rosen Co., RCA Parts Distributors of the Philadelphia territory.

RCA ANTENNAS FAR AHEAD OF PACK—FROSELL

Fuhrman, Hollywood, Wins
Seventh Pencil for RCA
Antenna Sales

RCA Parts Division,
Camden, N. J.

Inclosed you will find 20 RCA labels on the World-Wide Antenna. I've installed more antennas than the number inclosed, and have in every instance been more than satisfied with the performance.

I have made many comparative tests and have yet to find an antenna that will approach yours. Some may be just about as effective at a particular frequency, but are far off at some other. Not one has compared with the RCA in the wide range of effective coverage at all frequencies, not one has reduced the noise on short waves as much, and no other antenna has really satisfied the customer and given him the results he had been led to expect from the advertisements.

I haven't been sold on any product so completely as your RCA World-Wide Antenna. My first test installation proved that it was THE antenna for short-wave reception. I've installed and recommended them since.

Very truly yours,
Herbert C. Frosell,
97 Sixth Avenue,
Troy, N. Y.

Radio service engineers, who have always been "from Missouri" about antenna systems, are telling people, including the RCA Parts Division, that the RCA World-Wide Antenna is in a class by itself. B. M. Fuhrman, for instance, owner of Mission Radio Service, 1121 S. Lucerne Ave., Hollywood, Calif., is one who tells people, and proves it with sales. Herbert C. Frosell, 97 Sixth Ave., Troy, N. Y., is another who vouches for the RCA World-Wide Antennas.

Special Pencil Presentation

On February 2nd, Fuhrman sent the labels from ten RCA World-Wide Antenna Kits to the RCA Parts Division, to win his fifth RCA Service Engineer's Pencil, the handsome pencil that has three colored bands on the barrel that tell at a glance the coded value of any resistor according to the RMA Color Code. On March 13th, Fuhrman wrote again and enclosed labels, concluding his letter, "This is the seventh pencil I've won. Your District Manager, A. E. Jackson, presented me with the seventh one when the picture (shown below on this page)

PENCIL OFFER IS WITHDRAWN ON APRIL 30th

Notice is Given of With-
drawal of Pencil Offer,
Effective April 30th

Hurry! Hurry! Hurry! If you haven't already won an RCA Service Engineer's Pencil, get out and sell those RCA World-Wide Antenna Systems. The labels from ten Kits are good for a Pencil provided you get them in to RCA Parts Division, Camden, N. J., not later than April 30, 1935. The offer is withdrawn, effective that date.

The RCA Service Engineer's Pencil is just what every radio service engineer needs to tell him the coded value of resistors at a glance. Three colored bands turn on the barrel of the pencil. By aligning them in accordance with the colors of the resistor, the coded value of the resistor in ohms can be read in plain figures.

The offer which is being withdrawn on April 30 gave a pencil to any service engineer who sent in the labels from 10 RCA Antenna Systems, any model. There are two labels on each RCA World-Wide Antenna System making twenty labels required to win a pencil, with the exception that the single label on an RCA Dealer Demonstration Antenna

was taken. Thank you for making it possible for me to get them."

In another letter to Jackson, Fuhrman wrote:

"Just recently I was called to Van Nuys, just outside Los Angeles, to determine how reception could be improved on an eight-tube Patterson receiver—all-wave.

"I found that a 1000-volt electrical transmission line passed directly in front of the house, and the noise was so bad that you could hardly play a local station, or San Diego, 150 miles away.

Remarkable Improvement

"I suggested the installation of an RCA 9555 Double-Doublet, with 24-foot poles above the roof. This would bring the flat top of the aerial about even with the Hi-Line and about 35 feet away.

"With the new aerial, both short- and long-wave stations came in with excellent volume, and the noise was gone. The improvement was very remarkable and gratifying.

Yours very truly,
B. M. Fuhrman.

Sells 70 Antennas—Wins 7 Pencils



B. M. Fuhrman of Mission Radio Service, Hollywood, Calif., receives his seventh RCA Service Engineer's Pencil, the award for selling seventy RCA World-Wide Antennas. Standing, left to right, are B. M. Fuhrman, A. E. Jackson, RCA Victor District Service Manager, and Paul Buehler, Service Manager for Leo J. Meyberg, Distributors.

Kit counted as much as four labels from any of the other Kits.

Old Offer Withdrawn April 30th

Those who have been working for a pencil under the old offer of one pencil for the labels from 10 RCA Antenna Kits have not been overlooked, however. The old offer is withdrawn, effective April 30th, but even those who may not be able to accumulate labels from 10 kits by that time can still obtain a pencil direct from the RCA Parts Division, Camden, N. J., by sending in whatever labels they have, plus a small amount in cash—5c for each missing label. If a service man has the 14 labels from 7 RCA World-Wide Antenna Systems, he adds to them 30c in cash, which is 5c for each missing label.

RCA POLICIES COMMENDED BY TRADE PAPER

Movie Men's Magazine
Pays High Tribute to
Fair Practices of RCA

Radio service engineers who may sometimes wonder whether strict business honesty and fair dealings are appreciated by customers can take heart from an editorial that appeared in the January issue of the *International Projectionist*, the magazine for motion picture exhibitors.

Commenting unfavorably on the service policies of the various manufacturers of sound-on-film equipment, the editorial made an exception in the case of RCA, pointing out that in addition to making great technical progress, RCA's word could be depended on and that RCA had been "one of the most beneficial influences in this industry."

In the following excerpt from the editorial, the "electrics" referred to are other makers of sound-picture projecting equipment.

Abuses in Sound Servicing

"There have been serious abuses in sound system servicing to date in this field. Beginning in 1928 the electrics socked this business for every nickel they could squeeze out of it, and their antics with respect to ten-year contracts, patent hooey, weekly charges, the forced sale of parts, a goodly portion of which were absolutely unnecessary, and general all-around pig-headedness in matters concerning the general welfare of the industry are items for careful cataloging.

RCA Fair in All Dealings

"Fairness demands that an exception to the foregoing be filed in behalf of RCA. This Company represents one of the most beneficial influences in this industry since the introduction of sound pictures. Fair in all its industry dealings, whether to exhibitors in the matter of equipment sales and service or to Labor and the press in matters directly affecting either or both groups, RCA has earned special consideration in this field. Labor in particular has had no better friend in this business than RCA.

Noteworthy Technical Progress

"Further, RCA never attempted to 'hog' industry activities in either exhibition or production. Its technical progress is noteworthy: it was the first to introduce all-a-c operated equipments; it was the first to openly advocate the junking of cumbersome storage batteries, while others clung tenaciously to their use and resented any implication that batteries were less than perfect powering devices; it was first in the matter of outright sale of equipments, as well as the first to abolish compulsory servicing, and it has consistently worked toward simplification and improvement of its equipment. Also RCA recording has constantly improved and today it is superb.

Will Accept RCA's Word

"RCA's statement of position relative to extended theatre servicing work, as outlined elsewhere in this issue, including its attitude toward exhibitors, supply dealers, manufacturers and Labor, is accepted by this publication at its face value. In fact, the experience of this publication with RCA, its contact with RCA representatives, impels the statement that this publication will accept RCA's word for anything; and it recommends that its readers do likewise not only on this question of servicing but in all matters. RCA's record in this field demands nothing less."

Radio's Newest Feminine Star



Little Peg La Centra, winner, with Bob Lawrence, of the RCA Radiotron "Stars of Tomorrow" contest. She will be heard on Victor Records, and as soloist with Ray Noble's Orchestra on the RCA Victor Radio City Party Saturday nights from 9 to 9:30 E. S. T. The series, to be broadcast over a coast-to-coast NBC network, began March 23rd. RCA Antennas are mentioned in the commercial.

SIMPLE RULES INSURE QUIET ANTENNA JOBS

New Arrangement of RCA
Doublets Reduces
Space Required

Often the Service Engineer is confronted with a number of problems when erecting the RCA World-Wide Antenna which are easily solved if two simple rules offered by the RCA Engineering Department are used.

These rules cover the problem of placement of the antenna in particularly noisy locations and the erection of the antenna where space is limited.

Noisy Locations

Often when installing the RCA World-Wide Antenna in business districts, the multiplicity of noise-creating devices makes the choice of the best location for the antenna difficult. However, there are two rules that always apply and which make the choice of location fairly simple. The rules are:

1. Point the antenna toward the source of noise.
2. Erect the antenna as far away from noise sources and as high as possible.

The reason for pointing the antenna toward the noise source is to reduce the

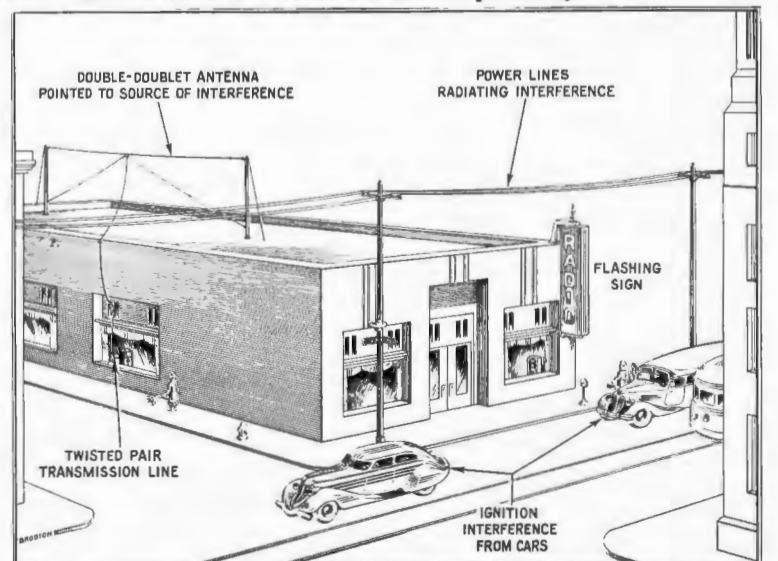
noise pickup as much as possible. The direction for maximum pickup of the double-doublet antenna is from directions broadside to its length with the minimum pickup in the direction of its length. Consequently, pointing the antenna toward the source of noise produces minimum pickup from that direction with the consequent reduction in noise.

Erecting the receiver as high as possible has a greater relative advantage than is at first appreciated. This is caused by two conditions: First, erecting the antenna as high as possible usually increases the distance from noise sources. Since radiation is not directly proportional to distance, doubling the distance more than halves the noise pickup. Second, doubling the antenna height more than doubles the pickup of radio signals.

The illustration shows the proper position for an antenna at a busy intersection.

Limited Space

Often when erecting the RCA World-Wide Antenna, the space available is such that the full span of 56 feet cannot be obtained. Loading coils are available which permit the span length to be reduced with a slight decrease in efficiency. However, by erecting the short length doublet at the top and the long doublet at the bottom considerable reduction in span length may be obtained without any reduction, in efficiency. By increasing the angle of the spans (bringing the long span farther down each pole) the total length may be adjusted from 33 feet to 52 feet. The shortest span is the least efficient while the longest span is equally as effective as the standard method previously used.



"Point the double-doublet at the source of interference," is the rule for maximum noise-reducing effect from the RCA World-Wide Antenna in noisy locations.

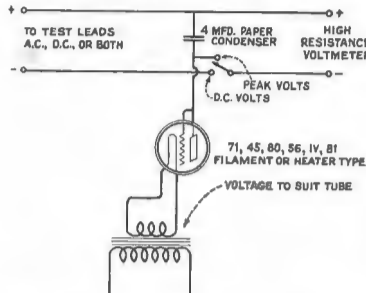
SERVICE TIPS

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

Service Tips are our readers' ideas, not ours. While RCA RADIO SERVICE NEWS believes they are worth while, we can not be responsible in any way for results obtained. Drawings or photographs submitted will be returned only on request.

Peak Voltmeter Correction

In the February 4, 1935, issue of RCA RADIO SERVICE NEWS, a service tip from Mr. Raymond C. Wyman was published on a peak voltmeter. However, through an oversight the diagram



was omitted. This diagram, which will help readers who desire to construct this useful device, is shown above.

Radiolas 44, 46, 47

I have had several jobs where the pewter chassis of the radio frequency unit had warped. This pulled the rotor plates of the tuning condensers over till they shorted to the stator plates. To correct this, I drilled the holes in the bakelite strip holding the stators in place a little larger. This allowed me to move the stators over till they centered with the rotor plates again. After setting the trimmer condensers the set worked as well as ever.

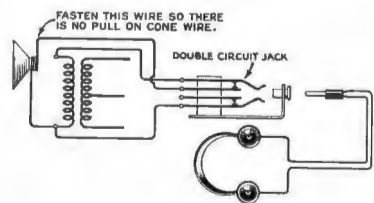
M. L. Meek,
1110 Valmont Street
New Orleans, La.

Grebe SK-4

Intermittent Operation— Sometimes this set would operate normally for several days and other times it would cut out after a few minutes' operation and volume drop to bare audibility. All circuits were carefully checked, but checking voltages was difficult, as the voltmeter being connected between the screen or plate of any socket and ground would cause the set to resume normal operation. All resistors were given a test with an ohmmeter and all tested normal. Then all by-pass condensers were given a test. The result was all tested normal.

Finally, as a last resort, the substitution method was resorted to and the trouble was immediately located in the first RF stage. The .1 mfd. by-pass condenser by-passing the 20,000-ohm grid resistor was opening intermittently. Replacing this condenser remedied the trouble. This condenser must be grounded to the small coil under the chassis where it connects to the first RF grid coil or satisfactory operation will not be realized. If this condenser should happen to be shorted to ground, the volume could not be controlled, going to maximum, as it shorts the volume control from the circuit.

L. D. McClintock,
912 Pacific Street,
Osawatomie, Kansas.



Headphone Connection

In your last issue you showed a diagram for connecting headphones to sets such as the 141-E, for example. The enclosed diagram shows our way of doing same. It is very easy to do, is free from hum, and does not disturb any of the wires in the chassis.

Richard J. Doyle, Jr.,
Doyle's Mount Kisco
Radio Shop, Inc.,
Mount Kisco, N. Y.
(4 Maple Avenue).

RCA Radiolas 17 and 18

When replacing the volume control in RCA Radiolas 17 and 18, in which strong local stations cannot be turned down low enough, first remove the old control. Install a dual unit, one unit of which is a 25,000 ohm tapered for bias, and the other a 10,000 ohm tapered for antenna control. Connect the 10,000 ohm side exactly as the original control. Disconnect the green wire with red tracer from the 26 filament center tap resistor in the pack, and run it to one side of the 25,000 ohm control. Connect this center tap to the other side of the 25,000 ohm control. This puts a bias control in series with the fixed bias resistor and the center tap of the 1.5 volt winding of the transformer. This not only permits a zero volume adjustment but also gives much smoother control.

E. M. Prentke,
Prentke Laboratories,
1950 East 105th Street,
Cleveland, Ohio.

Eveready 50

A very satisfactory and economical repair can be made on this receiver whenever the high-resistance section of the dual volume control is burned out or mechanical defects occur by removing this section and placing a 50,000 to 75,000 ohm 2 watt fixed resistor in the same circuit. The other section of the dual control regulates the grid bias and provides ample control of the volume under all conditions.

Thomas V. Williams,
416 Cass Avenue,
Iron Mountain, Mich.

Bench Microphone

I have found that it saves considerable time to keep a small hand mike on the repair bench. With this the repairman can check immediately the amplifying end of a receiver, noting if the defect is in that end and saving him the trouble of checking the resistors and condensers in the receiving end.

It also proves invaluable in locating noises and crackles due to leaking and faulty materials in the power end as it cuts out completely the receiving end.

I have saved many hours using this mike and have found it quite helpful in checking complicated circuits.

Jack M. Selph,
3719 D'Hemecourt Street,
New Orleans, La.

File for Service Data

Regarding your column of radio service tips and things of use on the bench, I have been using a system of filing for several years that has been of extreme help and quick reference.

Get several old phonograph record albums and file the data of importance in the separate pockets under the headings desired. You can then put the heading of each pocket in the space on the inside of the front cover usually used for record titles and on the outside the general heading of each album.

These file on the shelf with the ends out and can be referred to very quickly and information otherwise lost will be at your finger tips.

Robert S. Gerwing,
312 North Broadway,
Santa Ana, California

RCA Radiola 46

Intermittent reception in this model has been caused by a faulty 8400-ohm voltage divider that would open and close at irregular intervals within the 900-ohm section. As space is at a premium in this power pack it is best to replace the entire voltage divider. When replacing 24-A tubes with the dome-top type the half shields will not allow the tubes to be inserted because of the tight fit near the middle of the bulb. These shields are made of soft aluminum and the circular opening can easily be enlarged by a little judicious crinkling with a small pair of pliers.

Victor I. Dudley,
517 Eleventh Street,
Franklin, Pa.

Intermittent Operation

Philco radios may cut on and off while playing. They will cut off only for a second or so, but it is very annoying. Usually this type of trouble is hard to find, but in the Philco sets you will find a number of by-pass and coupling condensers which are usually the offenders. I have found that in nine times out of ten if you examine the condensers you will see a small run of black compound running out of the center of the condenser lug where the contact wire comes out. Replace this condenser with another Philco part and your cutting off is gone.

P. J. Daley,
Daley Radio and Electric Co.
Hilliard, Ohio.

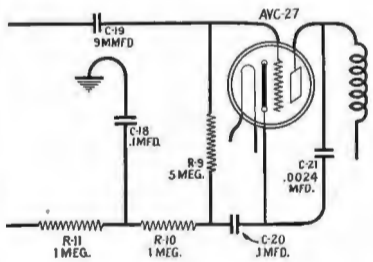
RCA Victor R-32

The set would not tune over the entire dial and the condenser plates were found to be shorting against each other at certain times but not always at the same position. This was always more or less with distortion. I found the trouble was in the tuning condensers and after removing shield cans found this defect. The condenser hubs are made of die-cast white metal and normally there is some play in these condensers. The hubs had worn on this set and since both sets of plates are movable they were so close they touched at times and one condenser would short and sometimes two at the same time. The vibration from the speaker was probably the cause of the distortion made by the vibration of the cabinet, causing intermittent reception. The remedy for the above trouble is thin washer on one hub, raising one side so plates space evenly.

Wm. Hansen,
Hansen Radio Service,
Niles, Michigan.

Intermittent Operation of RCA Victor R-11, RE-18, RAE-26, G. E. K-62 and Clock Model K-82

Set plays several minutes, then cuts off. Will resume its operation when AVC tube is removed from socket. If AVC tube is O. K., this condition is caused by C-18 or C-20 leaking. Replace with 0.1 mfd. condenser.



Set plays, then cuts off. Will not resume its operation with AVC tube out. Ground grid return of R. F. tube; if set plays then C-21 is shorted. Usually has high resistance short.

Set has excess noise, overload, distorts. No difference in performance with AVC tube in or out. Check R-9 for ground to chassis and AVC plate choke for open.

H. Ackerman,
1519 W. 5th Street,
Brooklyn, N. Y.

RCA Victor Models 330 and 331

Several cases of fading have been reported concerning the 330 as well as the 331 models. Upon close examination, it has been found that several of the small tubular condensers have become open circuited. This case was believed to have been caused by the heating of these condensers, which caused the black compound to move away from pigtailed at both ends, thus causing the condensers to become open. This case of trouble, of course, can easily be determined by substitution or by actually moving the condenser while the set is playing. The only remedy, of course, is replacement with a condenser that is totally covered with paper.

Albert S. Morgan,
Electric Shop of Kauai,
Lihue, Kauai, T. H.

PARTS SALES HIGH; HARTLEY IS PROMOTED

E. M. Hartley Transferred to Photophone; Built up RCA Parts Sales

E. M. Hartley, formerly Manager of the RCA Parts and Service Divisions, has been appointed Manager of the RCA Victor Photophone Department, according to an announcement by G. K. Throckmorton, Executive Vice President of the RCA Manufacturing Co. Hartley succeeds James E. Francis, who will soon take over new duties as Manager of RCA's Hollywood operations. Supervision of RCA Parts Division sales activities has been assigned to M. F. Burns, with G. P. Allen as Assistant.

E. M. Hartley, who now becomes Manager of the Photophone Department, dates his radio experience back to 1912 when he was a ship's operator. Later he was in charge of various radio stations for the old Marconi Company, predecessor to RCA. He was in the RCA Service Department since its beginning and in 1932 took charge of the newly organized RCA Parts Division. He is perhaps one of the best known and liked men in the radio service industry.

The sales of RCA replacement parts for all radios, RCA test instruments, and the famous RCA World-Wide Antenna Kits have assumed such proportions that a separate field sales force is now being organized to specialize on these products.

LUCKY!



George C. Beck, 154 Taylor Street, New York City, jumped out of his seat with joy when he discovered he held the lucky ticket for an RCA Oscillograph, grand door prize donated by Wholesale Radio Service Co., RCA Parts Distributors, at a giant meeting sponsored by Wholesale Radio Co.

FOUR POWER TRANSFORMERS COVER ALL REQUIREMENTS

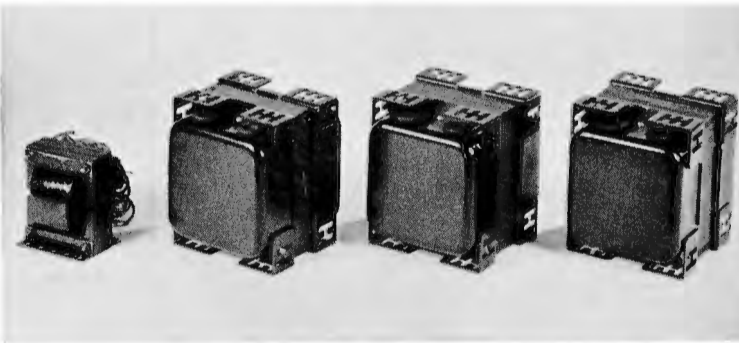
Schematic Diagrams Show Wide Electrical Specifications of New RCA Universal Transformers. Prices Are Low for Quality Replacements

Recent announcement by the RCA Parts Division of the Stock No. 9556 four-tube power transformer completes the line of RCA Universal Power Transformers for all makes and types of radio receivers. The new transformer has all the scientific design features of the other three transformers, although it is smaller in size.

According to W. W. Jones, Philadelphia District Manager for RCA Service Division, it is now possible for a service engineer or radio dealer to carry a stock of but four power transformers and thereby be in a position to service practically all a-c receivers

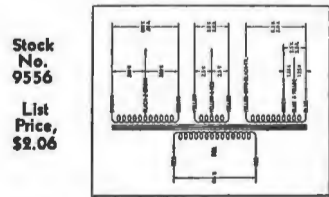
of any type or manufacture for power transformer failure. The transformers have sufficient taps for all electrical requirements and have a special slotted bracket for easily attaching to the frame of any radio receiver. For the benefit of those engineers not already familiar with the transformers, the schematic circuit diagram and load characteristics of each are shown in the illustration.

A feature of special interest to service engineers is the baked varnish impregnation which adequately protects all windings from failure because of climatic conditions. The Stock No. 9556 transformer has a list price of \$2.06.



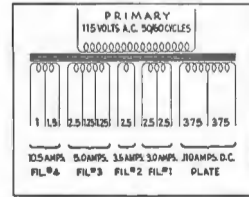
RCA's Universal Power Transformers, Universal electrically and mechanically. From left to right, Stock Nos. 9556, 9553, 9551, 9552.

FOR 4-TUBE SETS



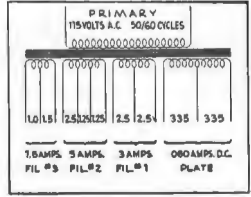
Stock No. 9556
List Price, \$2.06

FOR 10-12-TUBE SETS



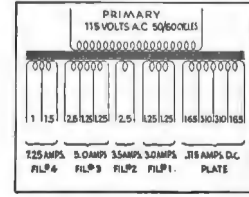
Stock No. 9551
List Price, \$6.00

FOR 5-9-TUBE SETS



Stock No. 9553
List Price, \$4.75

FOR ALL CLASS B SETS



Stock No. 9552
List Price, \$6.50

Taps for every purpose are revealed by the schematic diagrams of the RCA Power Transformers. Removable end bells with insulated grommets for leads make them pass the underwriters specifications.

SERVICE SHOPS FIND USE FOR TEST RECORDS

Variable and Constant Frequency Records Check Set Performance

The increasing popularity of the RCA Cathode-Ray Oscillograph and other service equipment that is rapidly raising the standards of the servicing profession has brought new interest in some little-known records produced by RCA Victor. While originally made for engineering laboratories, many service shops are ordering them after hearing them in use at RCA Victor Service Meetings.

Very few service engineers own beat frequency oscillators for the simple reason that those now offered are very expensive. However, all service engineers have use for a source of pure alternating current of variable or fixed frequency throughout the audio spectrum. The RCA Victor Technical Purpose Records fill this need at an extremely moderate cost. The 10-inch records sell for 75c, while the 12-inch records are \$1.25. Both are subject to the usual record discount. The following list shows a few of the most useful of these records. Others are available and a request to the Record Division of the RCA Manufacturing Company, Inc., Camden, for booklet, Form 8695, brings all necessary additional information.

Catalog No.	Size	Description
*XL-101	12-inch	Variable frequency of approximate-constant amplitude from 30 to 10,000 cycles.
*83001	10-inch	15-second periods of 46, 50, 58, 68, and 75 cycles per second.
84519-B	12-inch	15-second periods of 84, 125, 150, 175, 200, 225, 250, 275, and 300 cycles per second.
84519-A	12-inch	15-second periods of 350, 400, 450, 500, 550, 600, 650, 700, and 750 cycles per second.
84518-B	12-inch	15-second periods of 800, 850, 900, 950, 1000, 1100, 1200, and 1300 cycles per second.
84518-A	12-inch	15-second periods of 1400, 1500, 1600, 1700, 1800, 1900, 2100, and 2200 cycles per second.
84517-B	12-inch	15-second periods of 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000, and 3200 cycles per second.
84517-A	12-inch	15-second periods of 3400, 3600, 3800, 4000, 4200, 4400, 4600, 4800, and 5000 cycles per second.

*Single-face. All others double-face.

ATTENTION-GETTING FEATURE OF OSCILLOGRAPH WORTH UTILIZING

Multitude of Applications for New RCA Cathode-Ray Oscillograph Are Described by Development Engineer

By H. J. SCHRADER
RCA Development Engineer



H. J. Schrader

In addition to the many tests which may be made with the RCA Cathode-Ray Oscillograph, a dealer may well consider the possibilities it offers for attracting prospective customers for new instruments. It is well known that moving devices when used in window displays always attract attention. The oscillograph may readily be used for this purpose by placing on its screen the image of an incoming radio signal. Thus, the prospective customers may not only hear the reproduced music, but also see the signal causing this music. By paralleling an extra i-f stage with the last r-f stage of a receiver of good quality and applying the output of this stage to the vertical deflecting terminals of the oscillograph, such a picture will appear on the screen. The i-f transformer of this extra stage, of course, should be designed to properly match the input impedance of the oscillograph.

Customers See Own Voice

The dealer also may attract attention in the store by allowing a customer to see his own voice. To do this it is only necessary to use a receiver of the home recording type and connect the vertical deflecting terminals of the oscillograph across the voice coil of the speaker or recording pickup if it is in the circuit. It is quite interesting to observe how long a person can hold a constant note. This may be tested by using the timing axis at a frequency two or three times the frequency of the note to be sounded and checking the length of time the pattern remains motionless on the screen.

Comparisons of the relative fidelity of the audio system of various receivers may be observed by employing a magnetic pickup and a variable frequency, constant amplitude record. The output of the pickup may be applied to the receiver by any of the various known methods. The vertical deflecting terminals of the oscillograph should be connected across the speaker voice coil and the height of the pattern on the screen will then indicate the relative response of the amplifiers as the input frequency varies. For this use it is well to use a low-timing frequency with no synchronization.

Use Constant Frequency Records

By using a constant-frequency, constant-amplitude record, the overload level of the amplifier may also be checked. Use of a timing frequency of two or three times that of the record, and starting with a low-input voltage from the magnetic pickup will give best results. As the input is increased a point will be found where the shape of the image on the screen will start to change. This indicates overload and thus represents the maximum undistorted output of the receiver. By this method the output capabilities of various receivers may be demonstrated and compared.

The special constant frequency and variable frequency Victor Records mentioned in preceding paragraphs, are described in an article on this page.

Use of Oscillograph by Other Industries

The uses of the oscillograph outside of the radio industry, while perhaps not as well known, are many and, in all cases, either shorten the testing time or make possible tests impractical by any other method.

New Test Oscillator



The new RCA Test Oscillator, Type TMV-97-C, while similar to its predecessors in appearance, has several noteworthy improvements. It was designed especially for use with an oscillograph, having a jack for the connection. The net price is only \$34.50.

(Continued from page 1, column 5)

service to the most involved and complicated receiver. See this remarkable instrument demonstrated at your nearest RCA Parts Distributor. A jack and high output for use with an RCA Oscillograph, low leakage, and

switches for use as a heterodyne frequency meter are among the new features of the new instrument which are described in detail below:

90 to 25,000 K.C.

Frequency Range. The output frequency range extends from 90 kc. to 25,000 kc. by means of eight overlapping bands. This range covers all radio frequency and intermediate frequency line-up points of all receivers. The frequency range is covered entirely by the fundamental frequency of the oscillator, no harmonics being used.

Modulation. A separate modulator tube is provided which modulates the radio frequency output with a 400 cycle sine-wave voltage. There is a panel switch provided for operating the oscillator either with or without modulation. Also a panel jack permits applying an external modulating frequency voltage such as a beat frequency oscillator or phonograph output to the r-f signal.

Use With Oscillograph

Oscillograph Operation. Convenient operation with the RCA Oscillograph and RCA Frequency Modulator is accomplished by a sweep circuit jack and operation without modulation. This is a very important feature because of the increasing popularity of the oscillograph method of circuit alignment.

Heterodyne Frequency Meter. By plugging in a pair of headphones in the modulation jack, and placing the modulation switch at the unmodulated position, the modulator tube operates as a detector and the zero beat method of frequency checking may be used. This is very useful to amateur operators for checking the frequency of unknown transmitting stations.

Has Low Leakage

R.F. Output Voltages. A two-position toggle switch combined with a new variable attenuator circuit provides two ranges of output r-f voltages. The switch gives approximately a 100:1 ratio of voltage change. The minimum range of the high position overlaps the maximum range of the low position, thereby giving a continuous variation over the entire range.

It Can't Be Done, Says Avins

"FREE" RADIO SERVICE ??

Surely, you must know that no business can give you something for nothing. Our service is not free.

But we do offer you something you need—professional radio service at an honest price. We have the knowledge, equipment and integrity to put your set in perfect condition.

If your radio is not working at its best—if reception is noisy and poor, won't you phone us now. We know that you will be more than satisfied with the results.



Phone DOngan Hills 6-0565

AVINS RADIO SERVICE

303 Richmond Road . . . New Dorp

Integrity — Reliability — Quality



"Inspired by your editorials," was the simple message inscribed on this postcard when it was mailed to E. M. Hartley, former manager of the RCA Parts Division who was recently appointed RCA Victor Photophone Manager.

ENGINEERS AT MEETING SHOW CATHODE RAY

Demonstration of RCA Oscillograph Made Without Other Apparatus

At a recent meeting of service engineers in the plant of The RCA Manufacturing Company at Camden, N. J., Wm. F. Diehl, of the RCA Engineering Department, showed the simple manner in which demonstrations of the new RCA Cathode-Ray Oscillograph could be made without additional equipment. According to Diehl, in a time of thirty seconds, demonstration of Lissajou's figures, phase relations, distortion and other phenomena could be demonstrated merely by proper manipulation of the controls and touching certain points with the hand.

High Sensitivity Necessary

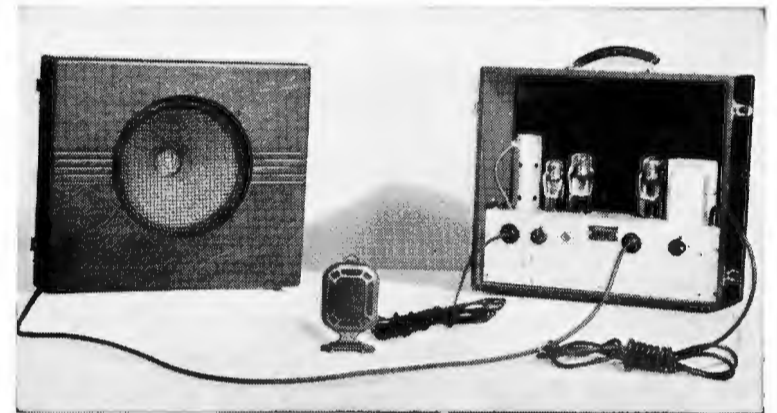
Due to the high sensitivity obtained through the use of specially-designed wide-range linear amplifiers, and other important features, the above-mentioned demonstrations are rapidly made. Simply plug the instrument in the 110-volt receptacle. Adjust the "intensity" and "focus" control for the proper spot

on the screen. Set the amplifier A and B controls to the "on" position. Turn both gain controls to their full clockwise position. Touching the "high" vertical input terminal with the finger will cause a vertical line to appear the full length of the screen. This line represents the amplitude of an a-c field, picked up by the body. Next, touching the horizontal "high" input terminal will cause a horizontal line to appear on the screen. By touching both terminals simultaneously, the line will slant to the right, which is the Lissajou's figure obtained when two voltages in phase and of equal amplitude are applied to both sets of deflecting plates. By adjusting the gain controls, other figures can be demonstrated.

A.C. Wave Shown

Next, set the amplifier switch "B" to "timing" and the external synchronizing switch to "ext." Touching the high input vertical terminal will cause a 60-cycle wave to appear on the screen. If there are extraneous disturbances around the room, the wave will not be a true sine wave, but will be jagged and distorted. By adjusting the "range" and "frequency" controls, one or more waves will appear on the screen. By adjusting the "syn." control, the picture can be made to stand still. By adjusting the gain controls, the image can be spread out either horizontally or vertically. By adjusting the beam centering controls the image can be moved up or down or to the left or right. Many interesting effects can be obtained by simply using the body as pick-up and in a short time complete operation of the instrument can be mastered.

Low-Priced But High Quality



This is the new RCA Victor low-priced P. A. System that should appeal to countless prospects who formerly could not get a high-quality unit at the price they could afford to pay. It has six watts undistorted output, two-button carbon microphone, packs neatly in a compact case, and the controls are so simple a layman can operate it. RCA Commercial Sound Distributors are featuring it at \$79.50.

Miniature Magic Brain. The heart of the improved test oscillator kit is the shielded coil and switch assembly, similar to the famous RCA Victor MAGIC BRAIN. This unit includes eight coils and an eight-position rotary switch, all compactly mounted in a drawn copper container. High efficiency and low leakage give an output r-f voltage adjustable over a wide range.

Dial. A variable vernier dial having an adjustable ratio of from 6:1 to 20:1 speed reduction is used to facilitate tuning. The dial reads directly in frequency, no curves normally being required.

Direct Reading Dial

Calibration. The direct reading dial is guaranteed accurate $\pm 3\%$. However, a blank card and frame on the back of the oscillator permits individual calibration when desired. Individual factory calibration is available at an additional charge of \$5.00.

Six New Jobbers Are Appointed for RCA Sound Products

Six leading radio distributing companies have been appointed wholesale distributors for the sale of RCA Victor centralized radio, public address, sound re-enforcement and other commercial sound applications, according to an announcement by W. L. Rothenberger, Manager of the RCA Victor Commercial Sound Sales Department, formerly known as the Centralized Sound Department.

All of the new distributors already represent RCA Victor in the sale of "Magic Brain" radio and radio-phonograph instruments and are expanding their activities to include the sale of commercial sound systems in the same territories they are now serving. The new appointments, which are soon to be followed by others, Mr. Rothenberger said, are in line with the Company's new policy of expanding and intensifying this phase of its activities to meet a constantly growing and profitable market for numerous applications of sound in commercial and institutional fields.

The newly appointed distributors include the R. S. Proudfit Company, Lincoln, Nebraska, whose President, Geo. E. Proudfit, has organized a new sound equipment division headed by L. R. Bickley, with many years of experience in this field; the Cleveland Distributing Company, Cleveland, Ohio, R. M. Becktol, President; Phillip Werlein, Ltd., one of the oldest radio distributing firms in the country, whose President is Paul S. Felder; the Klaus Radio & Electric Company, Peoria, Illinois, of which Henry Klaus is Sales Manager; the Dixie Maytag Corporation, Nashville, Tenn., headed by J. O. Smith; and the New York Talking Machine Company, of which H. P. Fillmore is President.

READY-MADE ADS AND STAMPED POSTCARDS HELP SALES

The ready-made ad and the Government stamped postcard imprinted with your name are great helps for aggressive Service Engineers. » » Their cost is low, and the results high. » » Use them to build your business. » » Postcards with your imprint, \$1.00 per 100, prepaid. » » Ready-made ads free.

ORDER THESE FREE READY-MADE AD MATS DIRECT FROM RCA PARTS DIVISION, Camden, N. J.



Foreign Stations like Locals

That's what you'll say when your new all-wave receiver is connected to an **RCA World-Wide Antenna.** PRICE \$6.00

Ask us about a Certified Installation

YOUR NAME AND ADDRESS

EM-20



More


FOREIGN STATIONS WITH LESS NOISE

When Your Short Wave Radio is connected to an **RCA WORLD-WIDE ANTENNA**

« « « You don't have to wait until the short waves are "hot" if your set is connected to an RCA World-Wide Antenna. Eliminates noise from electrical devices and automobiles. RCA Antennas are designed by the same engineers who maintain communication with 46 foreign countries 24 hours daily. Price \$6.00. Certified installation by our antenna specialists extra.

Your Name and Address

EM-22




IMPROVE YOUR SHORT WAVE

Radio Reception with the **WORLD-WIDE ANTENNA**

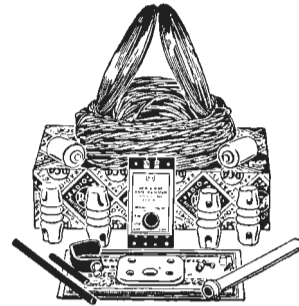
Regardless of the make, type or age of your short wave receiver, reception will be improved with the RCA World-Wide Antenna. Greater signal pick-up and reduction of noise from electrical devices and automobiles gives better reception in all locations. The RCA World-Wide Antenna is designed by the same engineers who maintain communication with 46 foreign countries 24 hours daily. Price \$6.00. Certified installation by our trained specialists extra.

Your Name and Address

EM-23



STATIONS NOISY? SIGNALS WEAK?



Stronger stations and less noise are assured by connecting your set to an **RCA World-Wide Antenna**

PRICE \$6.00 Installation Extra

Your Name and Address

EM-24



Radio Noisy?

Modern radios must have a scientific antenna for quiet reception. Let us show you how much more you'll enjoy your radio with an **RCA World-Wide Antenna.**

PRICE \$6.00 Installation Extra

YOUR NAME AND ADDRESS

EM-25




More Stations with Less Noise

When you connect your all-wave radio to an **RCA WORLD-WIDE ANTENNA**

PRICE \$6.00 Installation Extra

YOUR NAME AND ADDRESS

EM-26



Stations Weak?

You'll get stronger stations and less noise with an **RCA World-Wide Antenna.** PRICE \$6.00

Ask us about a Certified Installation.

YOUR NAME AND ADDRESS

EM-21

Government Stamped Postcards, Imprinted \$1.00 per 100 : Order any of these postcards imprinted with your name from your RCA Parts Distributor or from RCA Parts Division, Camden, New Jersey, enclosing remittance. » »



Weekly Service SPECIAL!

Our Trained Engineer Will Come to Your Home and—

- Align all circuits in your receiver (All-wave sets additional)
- Check and label all tubes
- Clean exposed volume control
- Remove corrosion from antenna terminals
- Clean and polish radio cabinet
- Estimate cost of additional repairs

ALL FOR \$2.00

YOUR IMPRINT HERE

Street Address Phone Number

City and State or Slogan Here

• For noise-free reception we recommend RCA World-Wide Antennas •

EM-16

A PROVEN BUSINESS-BOOSTER



RADIO WEAK?

We can see as well as hear exactly what is wrong with your radio on our **RCA Cathode Ray Oscillograph.** Drop into our Service Department and see this remarkable instrument.

We recommend and install the **RCA World-Wide Antenna System.** A necessity for noise-free short-wave reception.

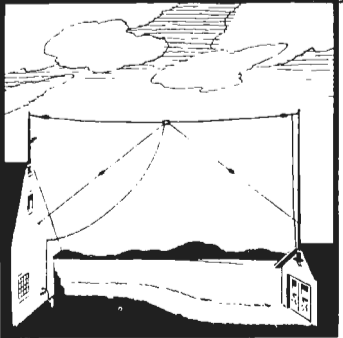
YOUR IMPRINT HERE

Street Address Phone Number

City and State or Slogan Here

EM-17

CASH-IN ON YOUR OSCILLOGRAPH



HOW'S YOUR ANTENNA?

Do you know a poor antenna causes more noisy and unsatisfactory reception than any other factor? The new **RCA World-Wide Antenna** guarantees more stations with less noise. Phone us; we'll be glad to tell you more about it.

We use the latest **RCA factory-type service equipment.**

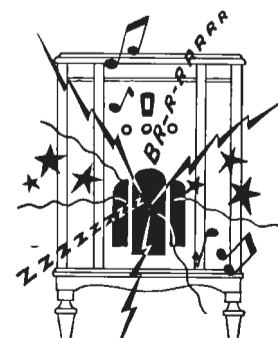
YOUR IMPRINT HERE

Street Address Phone Number

City and State or Slogan Here

EM-18

HELPS ANTENNA SALES



PROGRAMS NOISY?

YOU'LL never recognize your old set after one of our antenna, tube and alignment checks. We guarantee more signals, less noise and better tone quality. Latest RCA test equipment used.

AN RCA WORLD-WIDE ANTENNA SYSTEM Is a Necessity for Noise-Free Short-Wave Reception. Let us Install One

YOUR IMPRINT HERE

Street Address Phone Number

City and State or Slogan here

EM-19

A SURE REMINDER

URGES USE OF RCA PARTS IN SERVICE JOBS

Californian Finds RCA Parts Have Special Qualities For Custom Set Building

Editor's Note: C. Gilbert McProud knows good radio apparatus when he sees it—or uses it. He is a motion picture sound technician for one of the large Hollywood producers as well as a successful radio service engineer, and a graduate of California Institute of Technology.

Recently Mr. McProud wrote RCA RADIO SERVICE NEWS suggesting the addition of a modulation switch to the popular RCA Oscillators, Types TMV-97-A and B. Mr. McProud was advised that this feature was one of several already incorporated in the design of the latest RCA Oscillator, the Type TMV-97-C, which has just been announced by the RCA Parts Division along with a Modernization Kit permitting owners of the older instruments to bring their RCA Oscillators up-to-date at a small expense. Mr. McProud replied with the following article, which is here reproduced just as he so ably wrote it.

WHY NOT USE RCA PARTS FOR ALL SERVICING?

By C. Gilbert McProud



During the last few years of several years of radio servicing and custom set-building, I have begun to wonder why the RCA Victor Company has missed out on a very good market for its replacement parts. Of course, the company may not wish to encourage the use of replacement parts for ordinary servicing, or for custom set builders, but it has been my personal experience that we servicemen and set builders could take quite a lot of pointers from RCA engineers in our own work.

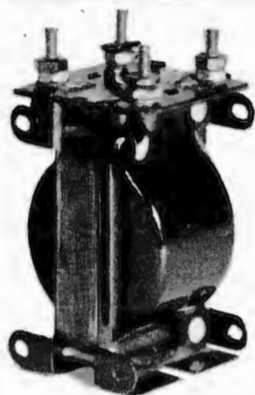
Likes Tone Compensating Controls

For example, the tone compensating volume control system first used in the R-78 model was not to be overlooked by anyone interested in high quality radio receivers. About two years ago, I used this means of audio compensation in a set that I built for myself, and ever since that time, I have not considered any other type of volume control. It is very difficult to obtain tapped volume controls for this purpose from the regular channels, but RCA Victor supplies them in two types—one tapped at 6000 ohms, total 30,000, and another tapped at 7000 and 14,000 ohms, total 44,000, and in addition supplies the necessary chokes and capacitor packs for use with them. The latest system is especially good, but should be used with an AVC system that provides almost perfect signal leveling, such as that used in the R-90, 280, and 281 models, which, though it requires extra tubes, is the most nearly ideal that I have encountered. I have found, however, that the 58 and 56 can have their functions combined in one 2B7.

"There Must be a Reason"

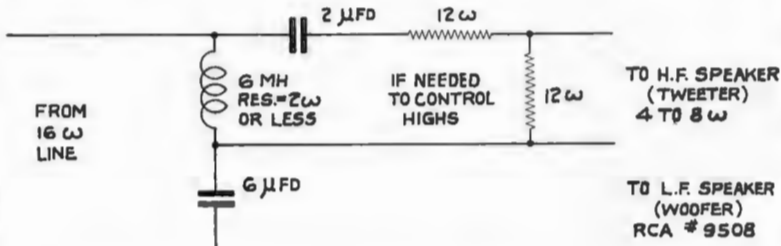
In custom-set building it is necessary to select some make of I.F. transformers. The so-called "quality" types are quite expensive, listing at around \$5.00. Most RCA models list around \$2.25 as an average, and these types furnish almost any combination of ratios, etc., and for some reason not apparent to the eye, are especially efficient. How RCA with one I.F. stage can obtain as much gain and as much selectivity as most manufacturers seem to with two I.F. stages still remains a mystery to me. In any case, when I use RCA I.F. transformers, I get the same results. There must be a reason! As to 460 kc. transformers, there can be no doubt that the type of winding used in the present models is very efficient, and it is surprising how the

Granddaddy



Above is shown the granddaddy of all universal transformers, the audio transformer used in certain RCA models as far back as 1924. Note that the mounting brackets are similar in design to those of the present line of RCA Universal Power Transformers.

performance of lower grade sets is improved by replacement with RCA transformers.



NOTE - 6 MH. CAN BE MADE OF OLD AF. TRANSFORMER CORE - ABOUT 60 TURNS OF #22 WIRE

High fidelity reproducer channel, using divided network and RCA Parts.

For straight broadcast band receivers, I get excellent results from RCA replacement antenna and detector-oscillator coils. I presume that this is because they are of precision quality. The 6308

antenna coil and 7481 detector-oscillator coils are ideally matched for BC sets. For general replacement use, 7480 is an excellent first I.F. transformer, and 6352 for succeeding stages. When the newest AVC system is used, the transformers from Model 280—6564, 6565 and 6566—are the most useful.

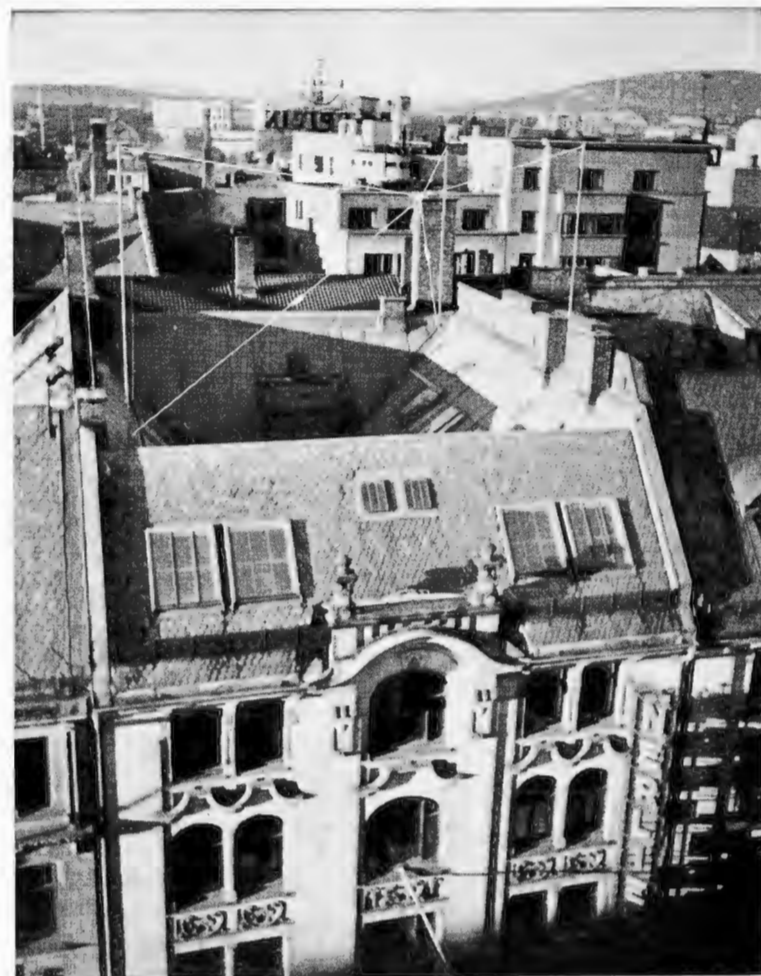
Speakers for High Fidelity

Even the loudspeakers are of a quality which is amazing, the prices are so low. For the user of a permanent magnet dynamic, 9429, \$4.85 list, is by far the least expensive of this type. The speaker list is topped by 9508, used in Model 281, which I would put up against any competitive speaker at twice the price—yes, even the much-touted "Auditorium Dynamics." For a high fidelity reproducer channel, the most value for the money can be had by using a dividing network across a 16-ohm line. The low frequencies are supplied to a 9508 speaker and the highs to a 9436 speaker.

To any RCA serviceman who really appreciates the line, the careful perusal of the service notes together with the yearly parts price list will show that prices are low, but the quality is there, regardless.

With all this rambling information, I have only endeavored to "tip off" my fellow servicemen to the advantages to be obtained by a careful understanding of RCA parts and their capabilities as

Sun Never Sets on RCA Antennas



The sun never sets on successful installations of the RCA World-Wide Antenna System. Above is shown the installation of J. L. Nerlien, RCA Victor Distributors in Oslo, Norway. The unique three-mast arrangement was made necessary by lack of space. Nerlien's reports "Reception considerably improved. We are eagerly awaiting the arrival of the No. 9555 DeLuxe Kits we ordered so that we can reduce the noise of our neon sign on standard broadcast."



Frequency Modulator

—FOR ALIGNING RECEIVERS WITH YOUR
RCA OSCILLOGRAPH

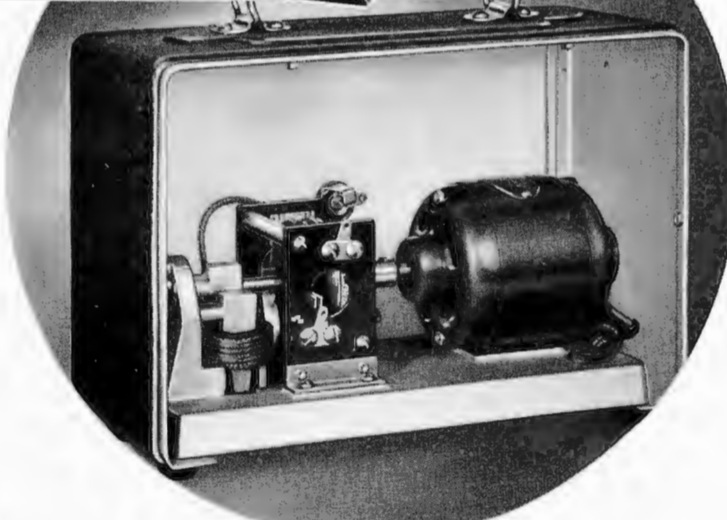
\$27.50

NET PRICE

STOCK No. 9558



Align your circuits visually with this new RCA Frequency Modulator and the RCA Cathode Ray Oscillograph. Sweeps the r-f voltage of your test oscillator over the resonant frequency of the circuit under test and generates an a-c synchronizing voltage simultaneously. Quick, accurate alignment, just like factory production, is quickly done, eliminating all possibility of error. Motor-driven, balanced tuning capacitor of two ranges and a-c generator driven from same shaft, thereby eliminating screen flicker.



SPECIFICATIONS

25 sweeps per second — 30 and 15 mmfd. — 14-inch low capacity cable — 50-cycle synchronizing frequency voltage — 1.5-volt generator output — 25 watts power consumption — 5 1/4 lbs. weight.