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RADIO SERVICE NEWS

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SERVICE MEETINGS START IN 65 CITIES FOR FALL SEASON

"Features Of New RCA Victor Receivers" Subject Of First Meeting In New Series

Service engineers everywhere will welcome the announcement by the RCA Victor Service Division of the new Fall service meetings to be held in 65 different cities. Discussions of the new circuits used in the sensational 1936 RCA Victor receivers, new loudspeakers, new RCA All-Metal Tubes and special applications of test equipment are but few of the many subjects for the first of the new series of meetings which opened on the Pacific coast in mid-August.

The meetings presented last year were so successful that the same plan will be followed this year, according to F. B. Ostman, RCA Victor Service Manager. The lectures will be of a strictly technical nature, interspersed with movies and other entertainment. "Besides the meetings in the 65 major cities," said Ostman, "we will conduct numerous other technical meetings wherever a few service engineers can be gathered together in smaller towns, presenting substantially the same material as at the larger meetings."

Demonstrations To Be Featured

Actual demonstrations of circuit phenomena, operating demonstrations of sets and many illustrations are included in each lecture. Use of the Cathode Ray Oscillograph in circuit explanations will be a feature of these meetings. The tentative schedule for the meetings is given in the following tabulation. To be sure of the date and place, consult your RCA Parts distributor.

New York District

Newark	8/19	9/23	10/28
New York	9/16	10/25	11/29
Hartford	8/23	9/27	11/1
Springfield	8/27	10/1	11/5
Worcester	8/29	10/3	11/7
Providence	9/3	10/7	11/12
Boston	9/4	10/9	11/13
Manchester	9/6	10/11	11/15
Albany	9/9	10/14	11/18
Syracuse	9/11	10/16	11/20
Rochester	9/13	10/18	11/22
Elmira	9/12	10/17	11/21

Philadelphia District

Baltimore	8/19	9/23	10/28
Philadelphia	8/21	9/25	10/30
Buffalo	8/23	9/27	11/1
Cleveland	8/27	10/1	11/5
Akron	8/29	10/3	11/7
Canton	8/30	10/7	11/8
Pittsburgh	9/3	10/9	11/13

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JOBBERS GIVE FREE CATALOG OF RCA PARTS

Thousands Of Parts And Specialties Listed For Ready Reference

Distributors for the RCA Parts Division are now offering free to service engineers and dealers a new 92-page illustrated catalog that is a veritable encyclopedia of radio parts, test instruments, and service specialties that carry a name that is synonymous with quality and consumer acceptance—RCA.

The scope of the new RCA Parts Catalog is apparent from a glance at the index, which makes it easy to locate in the book almost any replacement part needed for circuit repairs to almost any make set.

Many Diagrams and Charts

There are diagrams showing typical circuits using certain parts. A section is devoted to Phonograph Modernization parts and diagrams. Five pages are devoted to a standard RCA Radio Tube Chart giving complete electrical and physical specifications of tubes.

A feature of especial interest is a "Replacement Parts Guide and Cross Index" of RCA Victor, General Electric, Westinghouse and

(*Continued on page* 3, *column* 3)

Magic Eyes—She Has 'em, Too!

Prominent among Alabama's gifts to radio are Betty Lou Gerson, the 20-year old NBC actress who came honestly by her Southern accent; and the Southern Convention of Radio Service Men which was held in Montgomery in June, and at which steps were taken to improve the status of the profession in the South. The Convention was sponsored by the Alabama Radio Servicemen's Association.

MAGIC EYE IS A FEATURE OF NEW RCA SETS

Cathode Ray Tube Insures Exact Tuning Of All Stations

RCA Victor "Magic Brain" receivers now have a Magic Eye! In addition to improving the famous Magic Brain that made RCA Victor radios the sensation of the 1934-35 season, Radio Headquarters has incorporated two great new features in the 1935-36 line—RCA Metal Tubes and a new device called the Magic Eye!

(*Continued on page* 8, *column* 1)

RECEIVE C-W CODE SIGNALS WITH NEW BEAT OSCILLATOR

Reception of continuous wave code signals plus the time-proven "birdie" method of tuning weak stations are features all "brass pounders" (including ex- and ham) like to have in their radio receivers. The new RCA Beat Oscillator provides just such operation with any receiver of the super-heterodyne type. The price, $7.50, is well within the reach of all prospective customers.

Easily Attached

A feature of the new RCA Beat Oscillator is the quick and easy manner in which connections may be made to the receiver. This may be done without disturbing the chassis or removing it from the cabinet. Special connectors fit under tube prongs and supply both filament and plate power. A universal type of bracket permits the oscillator to be attached in any convenient manner to the cabinet. A handy operating switch and vernier frequency-adjustment lever give an easy method of placing the oscillator into operation and

(*Continued on page* 8, *column* 5)

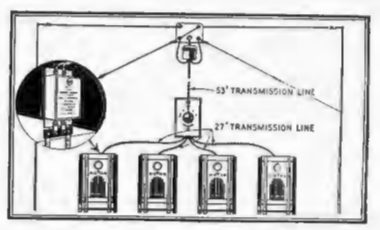
STORE SALES EASIER WITH NEW ANTENNA

Accommodates Four Receivers. Noise Reduction Now On All Bands

Announcement by the RCA Parts Division of the new RCA DeLuxe Store Antenna now brings the all-band noise reducing properties of the RCA DeLuxe Home Antenna to the dealer's store. Utilizing the famous double-doublet principle of pick-up and the weather proof transmission line of all RCA World-Wide Antennas, the new Store Antenna also includes a four-position selector switch and additional transformers and transmission line. This permits four different receivers to be attached to the same antenna, the switch giving a quick selection of receivers by instantly connecting the antenna to any one of four sets.

Reduces Noise on All Bands

Because of their location in highly congested areas, stores have, in the past, been handicapped by excessively noisy reception even on the broadcasting band. This has been due to the large number of electrical



Typical Store Installation

appliances in the near vicinity, such as signs, motors, elevators, etc., which radiate noise over relatively large areas. With the advent of the all-wave receiver, this problem has become intensified because of the increased susceptibility of short-wave receivers to man-made interference. For this reason, stores which should be the logical point for demonstrating all-wave receivers have often refrained even from attempting such demonstrations because of the adverse effects of noise. The loss in

(*Continued on page* 4, *column* 4)

THE TRILOGY OF BUSINESS SUCCESS—*An Editorial*

By F. B. Ostman, Manager, RCA Service Division

F. B. Ostman

To anyone acquainted with the history of radio servicing, it becomes apparent that a new industry is slowly achieving recognition. The orphan child is beginning to assume the stature of a man — a man to be reckoned with.

One sign of approaching maturity of the industry is that a class consciousness is developing. The members are joining together in organizations, are establishing standards for the profession, and are frowning on those who do not maintain them.

But the evolution is only begun. Though the child is no longer treated as an orphan, he is still a gawky youth with much to learn.

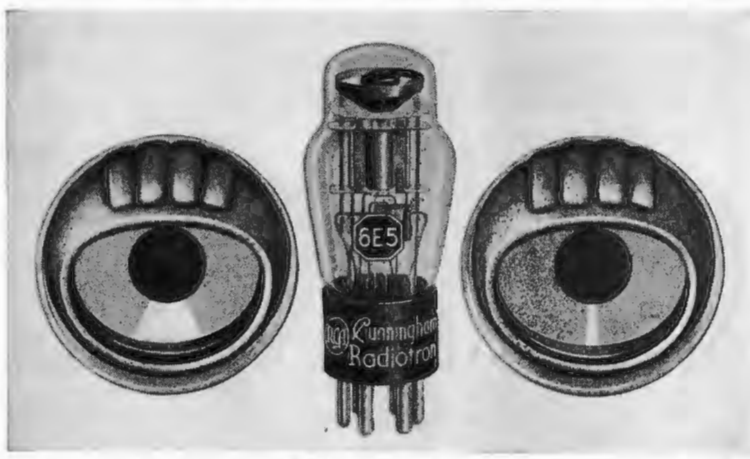
* * * * *

Radio service engineers find themselves in a complicated business that has three distinct elements: the technical part, the selling part and the business methods part. Too many service engineers today are poorly equipped in one or more phases of the business.

The technical side of radio service requires, first, knowledge; and second, equipment. Without these no man can or should succeed. Along with technical knowledge a man must have a willingness to welcome and keep abreast of progress in the industry.

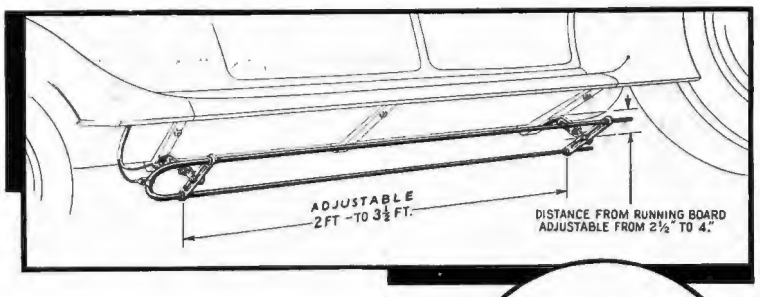
(*Continued on page* 2, *column* 1)

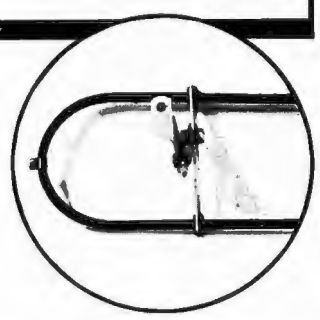
MAGIC EYE HELPS TUNING



A feature of the 1935-36 RCA Victor line is the "Magic Eye," which is expected to captivate the public's fancy as quickly as the Magic Brain did last year. Radio service engineers will recognize the "Magic Eye" as the small, new cathode ray tube, RCA-6E5.

Auto Antenna Reduces Noise





The noise-reducing principle of the famous RCA World Wide Antenna Systems has been employed in the new Di-Pole Auto Antenna, which is quickly installed under the running board of any car and is especially effective on the new steel top automobiles. Priced at $2.60 list, it has been an over-night success.

AUTO AERIAL WORKS WELL ON NEW CARS

Noise Reduction of New Di-Pole System Aids Reception

A "set-up" for the Service Engineer aptly describes the new RCA Di-Pole Noise-Reducing Auto Antenna which has recently been introduced to service engineers by the RCA Parts Division. Operating on entirely new principles, the antenna gives excellent signal pickup with a substantial reduction in ignition noise. It is the answer to the problem created by steel-top cars. Consisting of an eight-foot steel tube, bent to form a U, the new antenna is mounted under either running board by means of adjustable brackets. Its excellent performance and low list price of $2.60 have made it a best seller wherever auto radios are sold or installed.

Works on Any Car

While a large number of new cars have roof antennas installed at the factory, millions of cars on the road today do not have an antenna of any type. The new steel top cars have increased this number and will continue to do so in the future. The new RCA Di-Pole Antenna solves the problem of antenna installation in such cars in an extremely satisfying manner, both to the engineer making the installations and to the customer.

The illustration shows a typical installation with the antenna under the running board of a car. A special crackle finish and wax impregnation prevent weather and climatic conditions from affecting its efficient operation.

Balances Out Noise

The Di-Pole is broadly resonant at 7 meters, the frequency at which ignition noise is most troublesome. Energy from the ignition system which is induced into the antenna, sets up oscillatory currents between each Di-Pole leg and the adjacent car body. Because the two legs are in the same plane and are close together, the polarity and difference in potential between each leg and the car is exactly the same at any given instant. Therefore between the point of connection and car body there is not any flow of current caused by ignition noise pickup because the legs of the antenna having like polarities do not produce a difference in potential, a requirement for the flow of current.

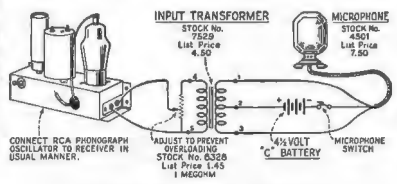
Picking Up Broadcasting Signals

For picking up the radio signals, the antenna functions somewhat differently. Broadcast signals induce a voltage into the automobile as a flat top antenna and due to the capacity between the car body and earth, cause current to flow. If a plate is placed between ground and car, the current from the earth to the car will have two possible paths in which to flow. One of these is from the earth to the plate and then to the car through the plate-car capacity. The impedance of this path is high. The other path is through the plate to the receiver and then to the car, the impedance of which is low. As these are two parallel paths, the portion of current which flows through the receiver depends on the relative impedance of the two paths. If the plate is near the earth the capacity between the plate and car is low (impedance high) and a greater portion of the current will flow through the receiver, a most desirable condition.

LOW COST P.A. SYSTEM EASY TO CONSTRUCT

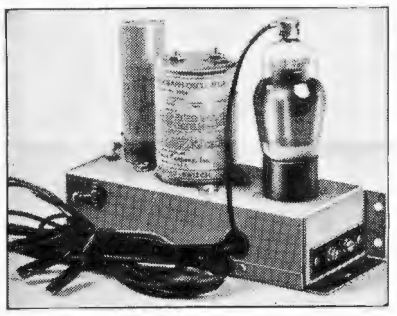
RCA Phonograph Oscillator Makes P. A. System of Standard Receivers

One of the most inexpensive and satisfactory P. A. systems is easily made with the RCA Phonograph Oscillator, a microphone, an input transformer, a potentiometer and a "C" battery. This equipment is used in conjunction with any good radio receiver. The output power and fidelity of reproduction is limited only by that of the receiver, thus permitting wide flexibility in this regard. Although in no way comparable to a factory-built job, the system described below serves many useful purposes.



Circuit of P. A. System

The manner in which such a system works is extremely simple. The proper connections and parts required are shown in the accompanying illustration. Speaking into the microphone modulates the output of the r-f oscillator which is fed into the receiver. This is then amplified and reproduced as a regular broadcasting station signal.



RCA Phonograph Oscillator

From the standpoint either of cost or of operation, such a P. A. system is quite satisfactory. As for portability, the equipment, less the receiver, weighs but a few pounds. As good radio receivers are available everywhere, and connections are simply and quickly made, transporting the phonograph oscillator and associated equipment is all that is required.

RCA ANTENNAS IN AFRICA

A service engineers' pencil, for selling ten RCA World Wide Antennas was won by Ingram & Company, Ltd., Nairobi, Kenya Colony, Africa.

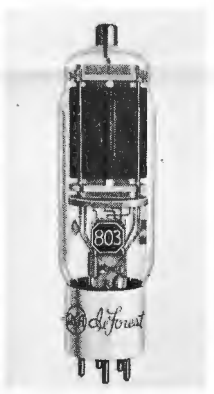
Oscillograph Featured in Window

A Cathode Ray Oscillograph in operation may be depended upon to attract attention and interest the public. Above is shown a most effective window in which a neat service bench was moved intact into the display window and the public's attention directed to the modern service facilities of the shop by a large sign and arrow pointing to an RCA Cathode Ray Oscillograph. An RCA Test Oscillator and an RCA Frequency Modulator are also visible in the above view. This splendid window was used by World Radio Corporation, Boston, Mass.

NEW RCA OUTPUT PENTODE GIVES HIGH EFFICIENCY

Operators of amateur radio stations may now obtain, through RCA deForest tube distributors, a new r-f power output pentode which is remarkable for its watts output per dollar invested. The new tube is designated as the RCA-803 and sells for $38.50.

The RCA-803 may be 100% suppressor - grid modulated with a carrier output of 50 watts. The simplicity of suppressor-grid modulation and the ease of adjustment for circuit makes this application of the RCA-803 particularly attractive to amateurs. When this new type is run as a straight Class C amplifier in telegraphic service, it is capable of 200 watts output. The RCA-803 is extremely easy to excite and can be driven by a relatively low-powered type such as the RCA-802.



It has a dome bulb construction which holds the mount assembly in precision alignment, an isolantite base, carbon anode, a thoriated tungsten filament, and many new features in both design and construction. Full technical information on the RCA-803 will be sent gladly upon request to the Amateur Radio Section, RCA Radiotron Division.

Miniature

Dr. G. H. Brown, Research Engineer of the RCA Victor Laboratories, demonstrates an experimental model of a new transmitting antenna, designed to have a uniform electrical cross section.

OSCILLOGRAPH GIVES DOUBLE IMAGE CURVES

Reverse Sweep Gives Symmetrical Alignment of I. F. Stages

The reverse-sweep method of circuit alignment with a cathode ray oscillograph, which was developed by RCA, has very definite advantages, according to W. F. Diehl, RCA Victor engineer. An exclusive feature of the RCA method is that it eliminates all possibilities of unsymmetrical aligning and frequency error.

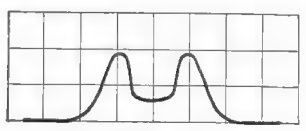


Figure 1

The RCA Frequency Modulator, which is always used with the RCA Oscillograph when aligning circuits, increases as well as decreases the frequency of the oscillator signal, thereby projecting two images on the screen, which show the appearance of the tuning curve under both conditions of sweep. Adjusting the trimmer capacitors of the circuit under test until the curves coincide assures a perfect alignment regardless of the curve shape, distortion in the detector or any of the usual features that are causes of poor alignment.

Sweep Frequency Important

An important point when using this aligning method is the choice of

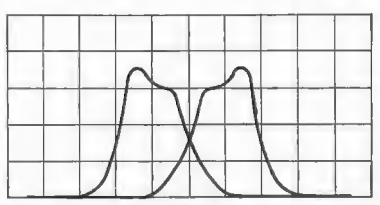


Figure 2

the proper sweeping frequency. This should be approximately 51 cycles, the same frequency as that of the frequency modulator. This is on Range 2, approximately 60 per cent clockwise rotation. Such a sweep frequency insures a proper double image on the screen. On some occasions, service engineers have used half this frequency and obtained an apparent double image which could be brought together as the trimmers were adjusted. Such an adjustment is not correct and merely is the adjustment for maximum frequency rather than a specified frequency. The curve shape of this incorrect curve is shown in Fig. 1, while the correct curve is shown in Fig. 2.

THE TRILOGY OF BUSINESS SUCCESS—*An Editorial*

(*Continued from page* 1)

He must realize that new developments, such as the more complicated circuits and the new metal tubes, are golden opportunities for the type of service engineer who will be a factor in the business in the more profitable days to come. Those who cannot or will not keep up will be eliminated.

* * * * *

Technical knowledge and equipment will not, however, assure success. Service engineers must learn to sell. They must learn how to convince the public that good radio service is the first essential of radio enjoyment. They must learn how to convince the public that high-quality replacement parts and high-quality work by competent, well-equipped men are worth many times their cost.

* * * * *

With adequate technical knowledge and equipment, and the ability to sell, any service engineer can keep as busy as a bee—and as poor as a church mouse, unless he learns to operate his business according to proven business principles. Only then is profit possible. Service engineers must learn how much it costs to make a call or to do a job, how much they should spend for advertising, how to collect for their work, whether they can afford to do some work at less than cost in order to develop other work that will return a profit.

Perhaps this last requirement for success should come first, for without a knowledge of sound business methods no service engineer should go into business for himself, although, if he has the first two essentials of success, he may do quite well working for someone else.

* * * * *

To have something to sell, to sell it, and to do so *profitably*, these are the trilogy of business success. It behooves every radio service engineer to study his own situation with respect to each of these three elements of his business.

No "Back Seats" at Convention

Thousands of prospects for RCA Sound Systems were created during the recent national convention of Shriners at Washington, D. C. What is thought to be the most elaborate sound system ever created enabled everyone to hear every program as well as though they had front row seats. The great installation was entirely of standard RCA units.

SHRINE MEET USES UNUSUAL SOUND SYSTEM

RCA Sound Job Covers Every Activity At Shrine Convention

The "greatest and most flexible sound system ever created" is the description that has been applied to the sound reenforcement and public address system used during the gala festivities and proceedings which took place during the national Shriners' convention in Washington, D. C., June 9th to 15th, according to W. L. Rothenberger, commercial sound sales manager for RCA Victor. The system, formed entirely of standard units sold by the Commercial Sound Section of RCA Victor, was installed under the direction of Frank M. Chase and L. H. Gilpin, managers respectively of Radiomarine and the Commercial Sound Department of National Electric Supply Company of Washington, D. C.

Sponsored by General Motors

Through special arrangements made by the General Motors Corporation, who provided the sound system and the official automobiles used during the convention, a total of 56 RCA Velocity Microphones and no less than 72 giant loudspeakers with associated apparatus were used daily during the convention.

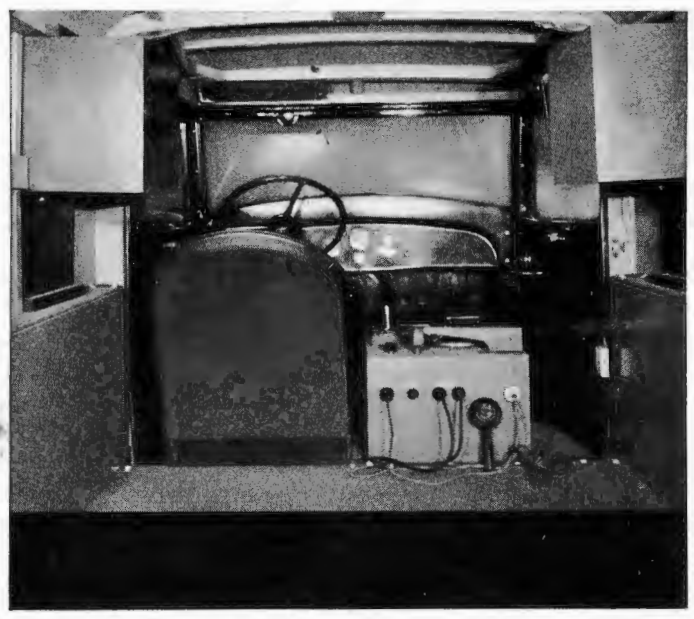
The entire route from the White House to the Capitol down which the parade and pageants passed was covered by the unique sound system. In each of the twelve blocks, four weatherproof, directional baffle RCA Speakers were mounted on 30 foot poles. Each speaker cluster was driven by three twenty-watt power amplifiers. Additional equipment included at the station in each block was one RCA Velocity Microphone with its associated pre-amplifier, one motor generator for field supply, 150 feet of microphone cable, and a telephone connected with a central control station.

Mike Placed on Floats

As the parade passed a control station, the velocity microphone was placed on the floats so that every thing that transpired was heard by everyone in the block. Between parades, the twelve stations were interconnected and the proceedings of the convention business meetings at the National Theater were picked up by velocity microphones and sent out over the entire system. At other times record music was broadcast to entertain the crowd.

Among the hundred thousand Shriners present were many influential men whose businesses in their home towns can profit by using RCA Victor Public Address and Commercial Sound Equipment. These men have seen an RCA Victor Sound System work perfectly under most difficult conditions and should be good prospects for any local service engineer who points out the innumerable uses of sound systems.

Makes Any Truck A Sound Truck



The convenience and ease of installation of the RCA Junior Sound Truck equipment is shown by the above view. Radio, phonograph and microphone controls are all readily accessible to the driver. This compact equipment may be mounted in almost any truck, which may still be used for its usual purpose.

ONE FUNCTION IS TREND OF METAL TUBES

Nearest Equivalent In Glass for Nine Metal Types Are Listed

While some of the new RCA All-Metal Tubes are similar in general functional design to glass tubes, the exact characteristics of each are new and should be treated as such. The general design trend of the metal tubes is to confine a single function into one envelope, avoiding dual purpose tubes to a large degree. Usually dual purpose tubes perform at a sacrifice in efficiency and often at a definite loss in performance. Use of the new RCA Metal Tubes, therefore, increases the efficiency of sets using them.

The following tabulation indicates the general performance characteristics of the new RCA All-Metal Tubes and the nearest glass equivalent.

Metal Type	Function	Nearest Equivalent Glass Type
5Z4	Full Wave Rectifier	80
6A8	Pentagrid Converter	6A7
6C5	Detector or Amplifier Triode	76
6F5	High Mu Triode	None
6F6	Power Amplifier Pentode	42
6H6	Twin Diode	New
6J7	Triple Grid Detector Amplifier	6C6
6K7	Triple Grid Super Control Amplifier	6D6
6L7	Pentagrid Mixer Amplifier	New

JOBBERS GIVE FREE CATALOG OF RCA PARTS

(*Continued from page* 1, *column* 2)

Graybar Receivers. This tabulation indicates the corresponding models of the brands named and lists the RCA stock numbers and list prices of the most important replacement parts for any of the four brands. Full electrical and mechanical specifications are given for all those parts that are suited for general replacement use as well as in RCA Victor receivers.

In commenting on the catalog, G. P. Allen, assistant sales manager for RCA parts, pointed out the wide variety of high-quality parts that are available under the RCA trademark. "We were pioneers in the radio business," said Allen. "We have made many different model receivers as well as radio products for every branch of the radio broadcasting and communications industry. It is our policy that 'no RCA Victor instrument ever becomes an orphan.' Naturally we require and maintain stocks of a wide variety of replacement parts. All of these parts that are in common demand are listed and in many cases illustrated in the catalog.

List Prices on Resale Items

"Prices shown in the catalog compare favorably with market prices on replacement parts that do not always carry the same assurance of dependability," continued Allen. "Radio replacement parts frequently look alike—but the difference between dependable parts and some parts that at first glance appear to be bargains lies in the rigid inspections and close tolerance limits enforced at the factory. Dependability does not always show in the appearance of the product, but it does show in the profits of the service engineer who builds his reputation with high quality parts that have a reputation known to the customer.

"Another thing about prices: the prices on all resale items in our catalog are list prices," Allen emphasized. "Even should our catalog stray into the hands of a consumer, the service engineer's profits are protected."

NEW RCA SOUND EQUIPMENT EASILY INSTALLED IN TRUCKS

Compact Equipment Has Special Tone Arm, Six Tube Receiver, Two Speakers, and Microphone

By installing the new RCA Junior Sound Truck Equipment, any business firm that owns a small truck may now easily convert it into a high quality sound truck, engineered by RCA and fully capable of doing an excellent sound advertising job. Because of its low price, thousands of firms, previously unable to use sound truck advertising, may now use this medium in a number of useful and novel ways. Enterprising service engineers will find a ready sale for such equipment to organizations desiring sound for public meetings, political gatherings, picnics, dances and many other places where a high quality sound system is necessary. Ease of installation is one of the desirable features of the new RCA products.

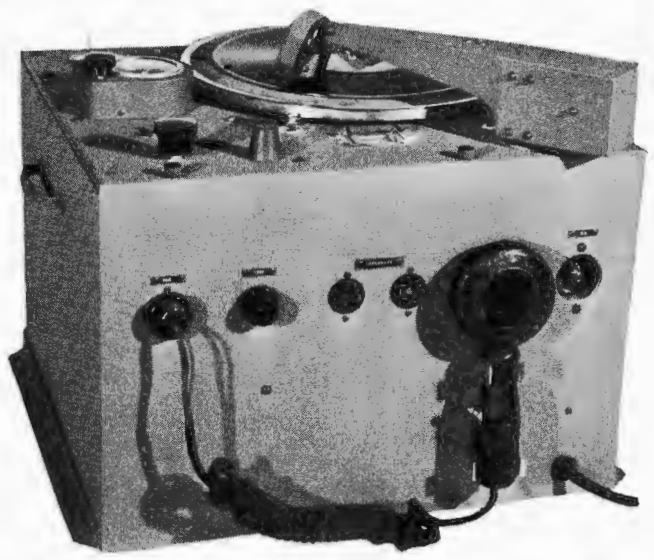
Small Space Required

Although the operating unit requires only 2¼ square feet of floor space and is powered by the car battery, it has 7 watts output.

Two 6-volt field, ten-inch electrodynamic speakers are supplied for mounting on each side of the truck, thus providing ample coverage on both sides of the street.

Radio, Record or Microphone Used

Including an efficient six-tube superheterodyne radio receiver, a two-speed turntable with a specially balanced tone arm (for rough roads) and a single button, close-talking microphone, the equipment is ready for every possible requirement of a sound truck. For operation, a voltmeter, volume control, tone control and lock give any desired flexibility for various operating conditions.



RCA Junior Sound Truck Equipment has everything but the speakers in one compact unit.

Conveniently Mounted

Because of its small size and simplicity of operation, the equipment can be easily mounted next to the driver's seat, as shown in the illustration. This permits the truck to be used for other purposes if desired. A sturdy wooden cover is furnished to fit over the top of the sound unit to provide extra room for a passenger beside the driver.

This equipment is sold complete, ready for installation. It may be obtained from any distributor of RCA Victor commercial sound apparatus. Further information can be had direct from the factory. Ask for Commercial Sound Bulletin, Form 10027.

A Catalog You Can Depend On

There are 92 pages of real values in this new illustrated catalog of RCA Parts, Test Instruments, and Specialties for the Service Engineer. It is replete with useful charts and diagrams, including an RCA Tube chart and a cross index of RCA Victor, General Electric, Westinghouse and Graybar corresponding models, with stock numbers and prices of the principal parts for all four brands of receivers. The catalog is free at RCA Parts distributors.

HANDY PEAK VOLTMETER IS EASILY MADE

Medford, Mass., Engineer Tells How To Build Useful Tool

A WORTHWHILE PEAK VOLTMETER
By Raymond C. Wyman

R. C. Wyman

The ability to measure peak voltages is an important requirement for successfully servicing receivers. Ordinarily such equipment is expensive and the average service engineer is not in a position to purchase it. However, the following device is cheap, easily constructed and gives a reliable indication of voltages ordinarily not readable.

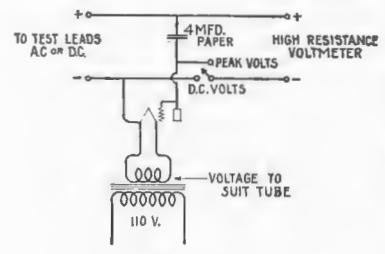


Figure 1

Fig. 1 shows the schematic circuit diagram of a peak voltmeter which I have used in my shop for over two years. Its greatest use has been for measuring the destructive peak voltages applied to filter capacitors which the conventional a-c or d-c voltmeters do not measure. Such exact knowledge eliminates guesswork, which is very important if satisfactory work is to be done.

Construction

The peak voltmeter consists of essentially a two- or three-element tube with its associated power supply, a high voltage capacitor, a double-throw single pole switch and a high resistance voltmeter of proper range.

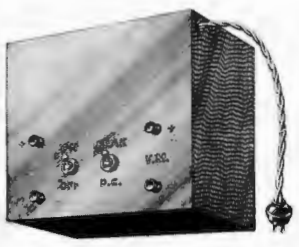


Figure 2

Tube. While most of the common tubes can be used for moderate voltages, I have used the type 71-A very successfully; the type 1-V is probably best for use up to 500 volts, such as will be found in most receivers. The RCA 1-V permits 500 volts difference in potential between the cathode and heater which allows use of a 360-ohm heater cord instead of a filament transformer for AC or DC operation. Binding posts should also be brought out for operation from 6 volt storage batteries when desired. See Fig. 3. For higher voltages, the type 81 tube with a filament transformer is the best to use. For greatest accuracy, the tube voltage drop should be low.

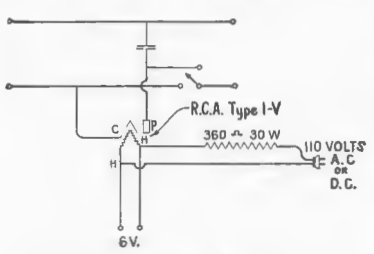


Figure 3

Meter. The 1,000-ohm-per-volt-meter which every service engineer has in his test box is entirely suitable for measurement purposes. However, the range must be the equal of or higher than the highest voltage to be encountered, 500 at least.

Capacitor. For greatest accuracy a paper capacitor of at least 4 mfd. capacity must be used. The voltage rating of the paper capacitor must be equal to or higher than the highest voltage to be measured.

Case. The entire assembly complete with the toggle switches may be mounted in any convenient case or panel. A suggested form is shown in Fig. 2.

Using the Peak Voltmeter

By rectifying and filtering any ripple voltage component of either an a-c or d-c voltage, its true value is obtained when the load consists only of the meter and capacitor. For example, a well designed filter circuit shows a voltage rating on the first capacitor higher than that of succeeding capacitors. By noting the voltage across the first filter capacitor at each position of the switch, it is very obvious that the peak voltage is much higher than the working voltage. Incidentally, the difference between the two readings is the peak ripple voltage, and its decrease in successive stages shows the effectiveness of the various filter elements. By changing the value of filter capacitors while observing the voltmeter, the practical value of capacity for each position is quickly determined. When replacing old inductively wound paper capacitors with new electrolytics this is very helpful. Remember, however, that the value of the first capacitor in a filter circuit determines the plate voltage of all tubes in the receiver.

Shows Value of Ripple Voltage

Fig. 4 shows a typical filter circuit having a tuned choke. Measure the ordinary d-c voltage across this choke (1st test). Probably the reading is less than 50 volts. Now change to the 500 volt scale and read the peak voltage. This shows a necessity of using a high voltage capacitor at this point. Now connect the instrument across the filter capacitor (2nd test) and try changing the value of the choke tuning capacitor for minimum hum. The peak voltages in vibrator "B" supply units are particularly worth measuring.

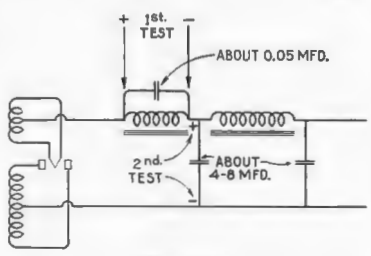


Figure 4

Connected from plate to plate of an output stage, the peak voltmeter makes an excellent output meter for peaking circuits, etc. Also, by multiplying any readings by 0.707 the A-C R.M.S. voltage is obtained on values above 100 volts. Lower voltages are not accurate because the tube drop becomes an appreciable factor. Filament voltage readings are impractical.

"CAESAR'S WIFE"

In a printed circular letter soliciting business for their service department, T. J. Owens, long-established furniture and radio dealer of 1074 Flatbush Avenue, Brooklyn, N. Y., listed a series of "Don'ts" to protect customers against radio repair racketeers. The back of the circular quoted a part of the "Caesar's Wife" editorial which appeared in the August, 1934, issue of RCA Radio Service News.

Let's Give 'em A Big Hand

W. H. BOHLKE
Camden, N. J.
In charge lecture preparation

C. C. AIKEN
Camden, N. J.
Supervisor, Service Schools

F. B. OSTMAN
Manager, Service Division

H. M. LEIGHLEY
Atlanta, Ga.
Service Manager, Southeastern District

R. D. WESTPHAL
Los Angeles, Calif.
Western Division Service Schools

A. E. JACKSON
Los Angeles, Calif.
Manager, Western Division

A. B. CHAPMAN
Dallas, Texas
Southwestern District Service Schools

CHAS. HERBST, JR.
Chicago, Ill.
Central District Service Schools

H. F. PITZER
Dallas, Texas
Southwestern District Service Schools

←LEFT
M. M. BRISBIN
New York, N. Y.
New York District Service Schools

RIGHT→
T. Y. FLYTHE
Camden, N. J.
Assistant on lecture preparation

G. W. KIMBALL
Camden, N. J.
Philadelphia District Service Schools

THEY PREPARE AND CONDUCT RCA VICTOR SERVICE MEETINGS

The men responsible for RCA Victor Service Meetings are deserving of a big hand, according to scores of letters received by the company from grateful service engineers. Attendance at the 1934-35 series totaled more than 45,000 and plans are completed for a 1935-36 series that will, it is expected, attract even more listeners.

Service engineers have given their hearty approval to the RCA Victor plan of confining service meetings strictly to service topics except for entertainment, usually motion picture comedies that are shown between technical talks. No selling is attempted at these meetings.

Much of the success of past meetings has been due to the careful preparation of the material by the men behind the scenes in the RCA Victor Service Department in Camden. Here the meetings are prepared in every detail weeks in advance. Lectures are written, films and slides are made to illustrate circuits, and finally each program is rehearsed. Then the material and demonstration paraphernalia is shipped to various parts of the country where the specially trained field representatives conduct the meetings.

Scheduled dates for the new series of meeting are given elsewhere in this issue.

NEW STORE ANTENNA

(*Continued from page* 1, *column* 5)

sales because of the inability to demonstrate has been a source of serious concern to all live dealers.

However, the new RCA DeLuxe Dealer Demonstration Antenna is RCA's answer to this all-important problem. Giving increased signal pick-up with noise reduction, it permits foreign reception demonstration in the vast majority of stores. The noise reduction is obtained in all bands, including the police and broadcast band, a necessity in many locations.

A Big Aid In Selling Sets

The new **DeLuxe RCA World-Wide Antenna System for Stores** makes it possible to sell customers when their interest is high, to close sales right in the store. It reduces noise both on standard and on short-wave broadcasts and insures strong signal pickup. The price is $10.80 net.

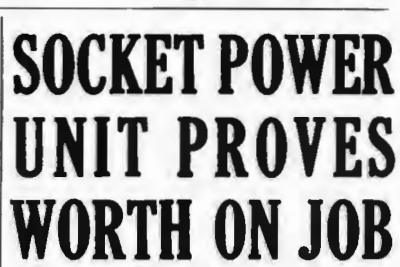
SOCKET POWER UNIT PROVES WORTH ON JOB

H. M. Leighley Of Atlanta Finds S.P.U. Provides Ideal "B" Voltage

The advantages of having always at hand an unfailing source of constant "B" power, such as is provided by the RCA Regulated Power Unit, TMV-118-B, was demonstrated recently on a theatre sound system service job, according to H. M. Leighley, RCA District Service Manager in Atlanta, Ga. The Power Unit he mentions is an instrument that plugs into any light socket and through a unique circuit gives better voltage regulation than "B" batteries. Service shops specializing in battery sets, and laboratories, have found it well worth the price, $39.50, at which RCA Parts distributors sell it.

Runs Curve With Oscillator

In the report submitted by Leighley he says: "At the time the RCA Regulated Power Unit arrived, I had just completed installing a low frequency booster in an RCA Photophone Theatre Equipment and was using the RCA Beat-Frequency Oscillator to run a curve on the amplifier and compare it with curves on an amplifier in which the booster had not yet been installed. I used the RCA Oscillograph to check the quality and found that the output, instead of being a pure sine wave, was very much distorted. Setting of the gain control, either in the oscillator or the amplifier, made no difference. I checked the oscillator direct and found the oscillator curve was also distorted. I had the 'A' battery changed but that made no difference. I then tried to locate



RCA Regulated Socket Power Unit

some new 'B' batteries, but there were none available. I then thought it would be a good time to try the new RCA Regulated Power Unit. When I hooked it up, all trace of distortion in the oscillograph curves disappeared, and I was then able to run the curves I desired on the amplifier.

Better Than "B" Batteries

"By using the power supply unit one is always assured of a power supply that is 100 per cent okay. This, coupled with the fact that the saving in batteries will, in time, offset the initial cost, should make it very desirable for every service shop to have one of these units."

SERVICE TIPS

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

RCA Victor M-34

In an M-34 car radio that was cutting on and off when hitting a bump, the trouble was found in an I.F. transformer. The primary leads were rather long and touched the can, a burnt spot inside the can showing the location of the trouble. Clearing the lead remedied the trouble.

C. de Waal,
737 Kayton Ave.,
San Antonio, Texas.

RCA and GE Auto Radios

On RCA and GE auto radio sets we have found that unless the screws that hold the vibrator to the frame are securely tightened that there will be considerable vibrator radiation to the RF end of the set with the result that a continuous buzz will be heard on the weaker stations.

David L. Clark,
Greeley Radio Clinic,
1014 9th Avenue,
Greeley, Colo.

High Voltage Shielding

To get rigidity and perfect shielding of the high side of the spark coil when installing an auto radio I use copper tubing. I wrap tape around the wire every three inches to keep it in the center of the ⅜ inch copper tube. It looks like a concentric feeder when you are through and noise cannot get out. Ground the tubing at various points and radiation is eliminated. It is also good for other shielding such as the antenna, but remember, too much will by-pass the signal.

G. A. Popdavid Radio Serv.,
1807 Bryan S. W.,
Canton, Ohio.

Interference Radiator

While clearing up ignition interference in an auto radio installation I learned that the metal eavestroughs around the top of an automobile (Studebaker) is a swell interference radiator unless well grounded.

Wm. J. Quinn,
Quinn Bros., Inc.,
112 N. Commercial St.,
Neenah, Wisconsin.

Tight Fitting Tubes

In servicing auto radios and other sets where tubes are fitted into sockets with tight springs in positions making it difficult to get hold of them, I have found it very helpful to push in a length of friction tape down over the bulge in the tube, then lap the ends over each other, twist them tightly together so the tape gets a good grip on the glass bulb. This will enable you to remove the tube without damaging it or tearing the set down. It has saved me much time and skinned knuckles.

Fred J. Elser,
P. O. Box 537,
Carlsbad, California.

Operating Switch Failure

In a number of cases where automotive radio owners and customers have complained of a seeming drop in volume and pick up, as compared to when the receiver was first installed, I have found that in all cases the culprit part to be the off and on switch. It seems that after being in operation for a while the contacts in the switch would fuse and oxidize causing a drop in voltage across the switch. In 90% of complaint cases this drop has been 1½ volts or more. In replacing these switches the service men should use one that has silver plated contacts. This usually cures the ailment.

H. T. Rodel,
5905 Belmar Ter.,
Philadelphia, Penna.

Elimination of Ignition Interference

Probably the greatest single help to clearing up ignition interference after suppressors and capacitors have been attached in the usual car installation is the proper shielding of the antenna lead. This should be shielded for a distance of at least two feet and grounded at each end to the car frame. The shield must cover the lead right into the receiver, not just up to it. One-half inch of exposed lead of the receiver end can pick up considerable interference even though the shield is well grounded. The length of shield is not critical after about two feet and several feet of unshielded antenna lead on the antenna end is not harmful. "Zero-length" pigtails are the goal of all auto radio designs.

Editor.

Model R-50, R-55 & RAE-59

A common difficulty in the RCA Victor 50, 55 and RAE-59 is excessive distortion at low volume unless the aerial is disconnected. A good remedy is to delay the automatic volume control action in order to increase the filtering in the R.F. grid return circuit. Disconnect the grid return lead from the coil above the chassis and insert a 250,000 ohm resistor in series with it. Connect a 0.1 mfd. capacitor from the coil connection to ground.

With this change, it will be found that the aerial no longer affects the tone quality.

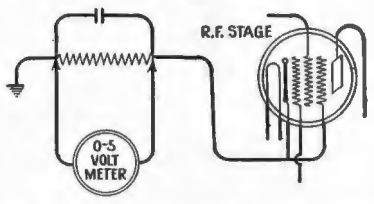
Sam Slymen,
Chapman & Perlitzer,
23 N. Alma St.,
Los Angeles, Cal.

Auto Radio Service

Seventy per cent of auto radio troubles are found in tubes or vibrators, therefore a quick check of these is necessary. I use an A.C. pack to replace the vibrator with two test clips. Clip the positive end on the cathode of the 84 tube and the negative on ground in most sets. This method will definitely show up a poor or wavering vibrator. I also have a rack of all auto radio tubes. These are painted red so as to distinguish them from stock tubes. These tubes inserted in the radio one at a time will show up a defective tube quickly. Most tube failure is due to vibration loosening the elements and causing noise which is hard to find on a tube checker. I believe that it is by far the best policy to replace worn vibrators with a new unit as repairs to them do not last. Some vibrators break the leads inside the can and it is best to check this before replacing with another.

J. E. Mace,
Engineering Laboratories,
64 Eliot Street,
Boston, Mass.

Alignment Indicator



Here is a service tip that I believe Servicemen would appreciate.

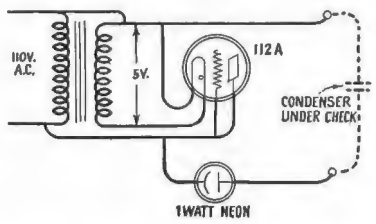
When lining up Receivers having automatic volume control, I use an unmodulated signal and 0-5 high resistance volt-meter connected across the R.F. Cathode resistor. Using this method, maximum output at the second detector is indicated by minimum reading of the meter. With no signal applied to the Receiver the meter will read about 3 volts and this reading will be reduced by a signal introduced into the R.F. or I.F. circuits. Except for an oscillograph this is a much more accurate method than the method using a modulated signal and the ordinary output meter.

C. W. Melotte,
Melotte Radio Service,
N. Lawrence, N. Y.

Condenser Checker

I know from past experience that a good many of the service men in this country have wished for a means of checking small condensers accurately. I was one of them for a long time.

The following checker will do this and can be made for a very small sum. It will check condensers as low as .01 and as high as 15 mfd. (both paper and wet or dry electrolytics for leaks, shorts or opens).



This checker in operation shows a flicker in the Neon bulb when a good condenser is under check, but will show a steady glow in the case of a short or an intermittent glow for leaks.

Hal H. Jacobs,
Radio Technical Laboratories,
4415 NE 34th Ave.,
Portland, Oregon.

More Ignition Noises in Auto Radios

Several different makes and types of auto radios which developed motor ignition noise after some time were found and corrected, after having been worked on and given up by other service organizations. On cars using the Electrolock Ignition, a steel conduit, flexible of course, leads from the ignition switch to the breaker box, carrying the ignition leads to protect them from tampering. This cable is clamped to a sleeve in the breaker box, and usually works loose in the sleeve, so that a poor ground at this point develops. Grounding the shield at the dash does not help, but soldering a piece of shielding from the steel conduit to the loose sleeve and then to the breaker box takes away every vestige of motor interference. This idea worked on several different cars and radios, and is passed on for its worth.

Noel L. Havermale,
711 South 16th Street,
Quincy, Illinois.

United Motors Auto Radio

Model 4037 United Motors radios and also similar type Chevrolet radios would come in with no screen grid voltage on the 75 tube. Resistor tested open until removed from circuit when it appeared normal again. This peculiar complaint was caused by replacing the 6F7 tube. The old tube tested fair. Have serviced a number of sets for this same condition.

Simon Cherry,
4940 Boudinot Street,
Philadelphia, Penna.

Majestic No. 66

An intermittent condition existing in Majestic No. 66 auto radios can be attributed to leakage in the high frequency leads as they pass from the pack through the chassis to the rectifier socket. A condition of this type is indicated by the low voltage and faulty vibrator action due to the increased load.

M. Chasin,
Bedford Radio Service,
1673 Bedford Avenue,
Brooklyn, N. Y.

Polarity Indicator

If stuck for a polarity indicator, a common Irish potato shunted across d.c. current will show green spot at positive side; of course there are limits to the voltage to which this applies.

L. M. Vick,
Woolard's,
Henderson, N. C.

SCHOOL OFFERS LOWER FEES TO SERVICE TRADE

Special Tuition Rates To RCA Distributors and Dealers

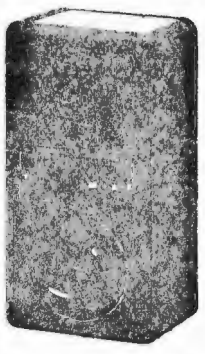
The finest instruction in radio, whether it is a residential engineering course or a service engineers' home study course, is now brought closer to service engineers through a special 25% reduction in tuition, according to W. F. Aufenanger, president of RCA Institutes, Inc.

Increasingly complex circuits require increased knowledge which can be obtained only through constant study. The advanced test equipment produced during the past year for servicing receivers has accentuated this need. RCA Institutes courses are produced by an experienced faculty having the entire resources of RCA at its command.

This special price reduction is offered to all RCA distributors and dealers and to their entire personnel. Independent service engineers may also obtain this price reduction by having the RCA parts distributors endorse their application, stating that they are a member of the service profession and that they use RCA parts in their service work. An illustrated catalog, describing the various courses can be had on request to RCA Institutes, Inc., 75 Varick Street, New York, N. Y.

New Uses For Output Meter

Service Engineers Use It To Check Tubes and Voice Coil Leads



Service engineers continue to find new uses for the popular RCA Output indicator. In addition to its usual function, many users of the instrument have found it to be the most effective means of showing the customer the difference in performance between old and new tubes, thus increasing the sale of tubes. The customer readily understands the significance of the variations in intensity of the light when the indicator is connected to the set and tubes are changed.

No Need to Unsolder Cone

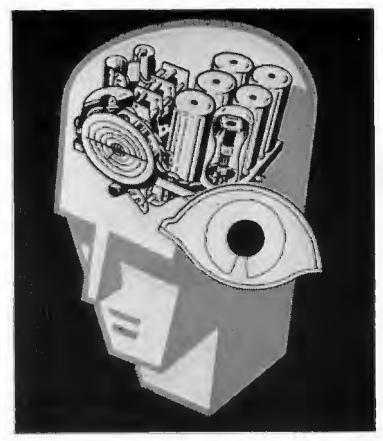
Now along comes H. B. Duncan of 1101 West Street, Wilmington, Del., who says that service engineers who have invested $4 in an RCA Output Indicator need no longer unsolder the voice coil leads to the output transformer in order to check the voice coil. To quote Mr. Duncan:

"Many service men unsolder the voice coil leads to the output transformer to check the voice coil. This is not necessary. Hook up an RCA Output Indicator across the voice coil leads and either tune in a station or use the oscillator for a signal. If the neon light flashes but no sound is heard, an open voice coil is indicated. The field coil can be rapidly checked by holding a screwdriver near the apex of the cone and feeling for the pull. Of course, care must be taken not to puncture the cone."

LAYS CARDS ON TABLE

Star Radio Company, of 409 Eleventh St., N. W., Washington, D. C., is another radio service organization that has found it profitable to lay the cards on the table in regard to the cost of radio service and the "something for nothing" advertising racket. Star used a half a page in the Washington *Herald* to give "the truth about radio service" and to explain that they charge a fair price for service and do not depend on excessive profits from parts to pay for "free service."

SYMBOL



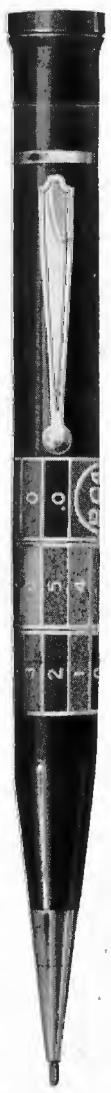
Above is the new symbol of RCA Victor receivers. The Magic Eye takes its place with the Magic Brain as a symbol of the finest in radio receivers.

SERVICE TIPS CAN NOW WIN CODE PENCIL

One Accepted Tip Wins Wallet; Three Tips Win Unique Service Pencil

Now it is easy for any service engineer who has solved a few puzzling service problems or who has at least three good ideas for simplifying shop work to win a worth-while prize.

Under the terms of a new offer, for a limited time only RCA Radio Service News will give either a genuine Pigskin Wallet and Memorandum Pad Holder or one of the much - wanted RCA Service Engineer's Pencils to anyone who sends in three "Service Tips" that are adjudged useful, whether or not the tips are published in this paper. The awards for acceptable tips are made with the understanding that RCA may publish the tips in RCA Radio Service News or in any other form it may desire.



Single Tips Win Wallets

Pigskin wallets will still be given for single tips that are sent in provided the tip is published. However, so many tips are offered that it is impossible to print all the good ones received in the space allotted. "Give us more Service Tips" is the cry from readers of RCA Radio Service News, and the paper and its sponsor, the RCA Parts Division, are preparing to do so.

Persons sending in three tips may choose either the wallet or the pencil. The pencil is a handsome automatic pencil with gold-filled point and clip. Its special feature is the Resistor Color Code Bands that tell the coded value of a resistor in a jiffy. Just align the colors on the bands to correspond with the colors of the resistor and the coded value appears in plain figures on the bands.

Offer Open For Limited Time

Rush your useful service ideas in at once to the Technical Editor, RCA Radio Service News, Camden, N. J. Be sure to state whether you prefer the wallet or the pencil. If only one tip is accepted, and it is published, you will receive a wallet. If three or more tips are accepted you will receive your choice of wallet or pencil.

OSCILLATOR CHECKS VALUE OF CAPACITOR

T. Y. Flythe Gives Easy Method For Rating Capacitors

According to Mr. T. Y. Flythe of the RCA Service Division, the RCA Test Oscillator TMV-97-C, or the modernized oscillators TMV-97-A or B, is an ideal instrument for accurately checking the value of extremely small capacitors. As all service engineers know, such measurements have been practically impossible without expensive laboratory equipment. However, with the RCA Oscillator, a phone plug, and the chart shown below, such measurements are easily made.

Requires Telephone Plug

Connect a two-wire braided cable or two individual wires laced together to a standard telephone plug. Leave three inches free at the end, for connecting to the unknown capacitor. Small clips should be fitted to each lead to facilitate connecting. Connect the unknown capacitor to end of these leads and insert the plug in the sweep jack. Place the oscillator in operation with the range switch at the 800 to 1500 kc.

RCA Test Oscillator

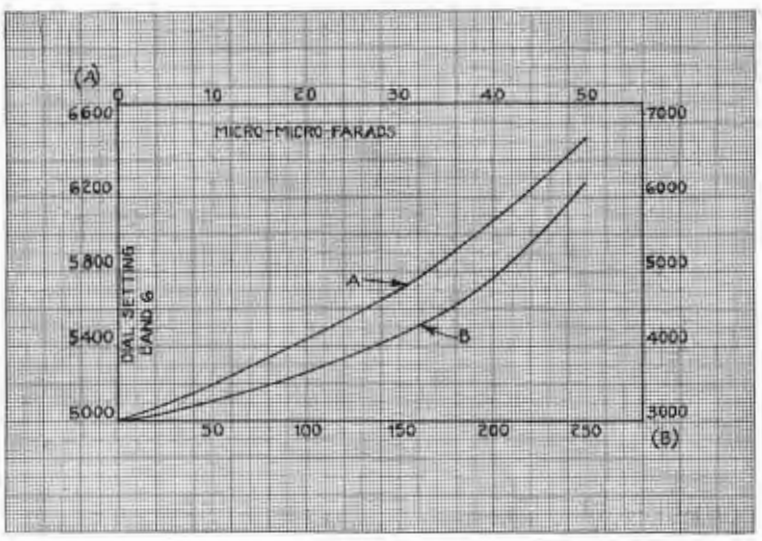
position. The oscillator is operated in this band so the capacitor may be checked in conjunction with any type of receiver. However, band 6 is shown on the chart as this band is better for calibration purposes.

Capacitors 2-50 MMFD

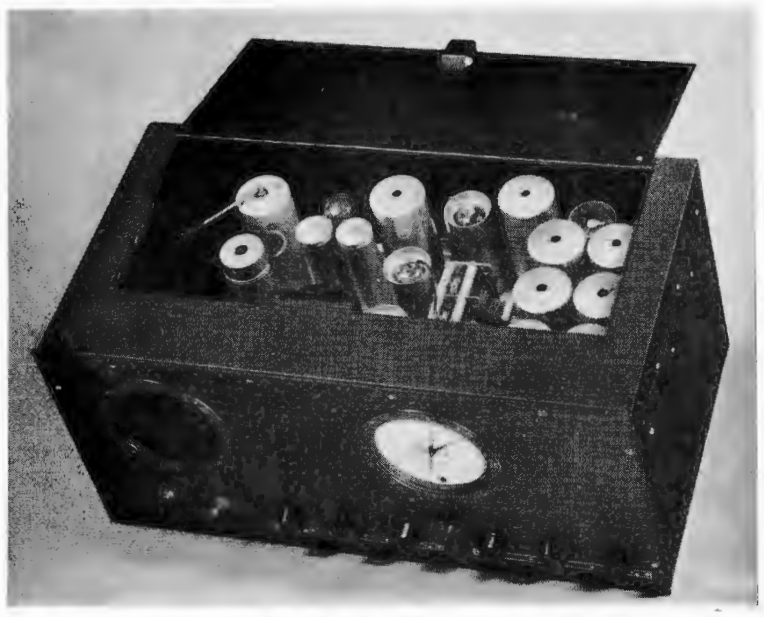
Set the oscillator dial to about 5000 kc. on dial for band 6. Tune in the signal on broadcast range of any convenient receiver. Place unknown capacitor across free ends of wires from test cable. Then reset the oscillator dial until the signal is again tuned in on the receiver. Compare the reading of the new oscillator dial setting from scale for band 6 with the capacity chart and follow across to curve A. At intersection, follow line up to Scale A and read the corresponding value of capacity. EXAMPLE: Oscillator dial at 5000. Connect capacitor. Retune oscillator for signal in receiver. New reading 5800. Consult chart. Read value of capacitor as 33 MMFD.

Capacitors Up to 250 MMFD

Set the oscillator dial to 300 ke. on scale for band 6. Tune in the signal as before and connect the unknown capacitor. Retune the oscillator as above until the signal is tuned in at the receiver. Compare the new setting of the oscillator dial for scale 6 with the capacity chart and follow across to curve B. At intersection follow the line down to scale B and read the corresponding value of capacity. EXAMPLE: Oscillator dial at 3000. Connect the unknown capacitor. Retune the oscillator for signal in receiver. New reading 5000. Consult chart. Read value of capacitor as 204 MMFD.



Brings Voices Across The Sea



THE RCA VICTOR AMATEUR RECEIVER, ACR-136

The habit amateur radio operators have of discussing over the air the merits of the equipment they use has been responsible for the speed with which the RCA Victor Amateur Receiver ACR-136 became popular abroad as well as in this country, according to E. C. Hughes, Jr., sales manager of the Amateur Radio Section.

"Amateurs recognize real value in amateur equipment," relates Hughes. "When they find something they like, they tell their friends about it through the facilities of their transmitters.

"Recently an interesting trans-Atlantic conversation was reported to us by an RCA Victor distributor in Sweden," Hughes continued. "It seems that one of the leading amateurs in Canada had just purchased an ACR-136. One of his first contacts was with a Swedish amateur, and he went into detailed description of his new receiver during the conversation, but did not mention the name or make of the receiver. After telling the Swedish amateur how much he liked the receiver and how well it was bringing in the signal from across the ocean, the Swedish amateur replied by saying that the receiver being used must be an ACR-136 the same as he was using."

In spite of the extremely low price of the ACR-136, $69.50 f.o.b. factory, it is capable of performance equal to that of other more expensive amateur receivers. It has features not usually found in amateur receivers selling at even higher prices.

PIONEER OPERATOR FAVORS DOUBLETS FOR AMATEUR USE

Underhill, W9PJQ, Gives Directions For One and Two Band Doublet Antennas

[Mr. Chester R. Underhill, author of the following article and the RCA Parts representative for Kansas City, Missouri, and vicinity, is one of the best known and most widely experienced operators in the radio fraternity. Holding an extra first grade commercial license and having served on the S. S. Leviathan, Mr. Underhill is now active in operating Amateur Station W9PJQ.]

AMATEUR USES OF THE RCA WORLD-WIDE ANTENNA SYSTEM

By Chester R. Underhill

A doublet antenna cut to a definite frequency and coupled to the transmitter through a properly designed twisted pair transmission line of correct length, forms a very efficient current-fed high angle radiator and offers a minimum of construction problems—thus making it ideal for amateur use.

For medium inputs to the final amplifier the RCA 9550 antenna kit offers the amateur an inexpensive combination noise-reducing system and an efficient high angle radiator. This combination is of extreme value in the 14 MC band where noise reduction is a necessity to receiving, and the efficient transmission of energy to the antenna is of paramount importance.

Single Band Operation

For single band operation the following method of coupling the doublets to the transmitter and receiver is recommended due to its simplicity and efficiency.

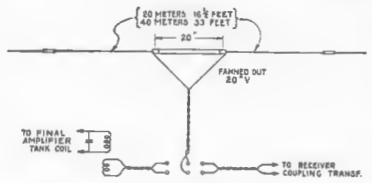


Figure 1

The length of the transmission line is given in the instruction pamphlet packed with the kit, and it should be cut to the lengths given or multiples thereof. For the 14 MC band the transmission line should be close to 36½ feet or 73 feet and for 40 meter band multiples of 73 feet. Couple one turn of wire (bare or insulated) to the cold end of the final tank coil or, if a push-pull or split stator arrangement is used, to the center (voltage node). Adjust the coupling for proper loading as indicated by the plate milliammeter. No antenna coupling condensers, coil taps or thermo ammeters are required.

If insufficient loading is experienced it is an indication that the feeder length is incorrect for a given location. To correct this condition take a plate current reading with fairly loose coupling (½ to 1 inch), add five feet of twisted conductor transmission line and take another reading. The current will either be higher or lower if the coupling has not been disturbed. If lower, cut off a foot at a time, taking a reading each time until the plate milliammeter approaches the desired load. If all of the five foot addition has thus been removed and the current is still rising then cut off six inches at a time from the original feeder length until proper loading is obtained.

Modified for Two-Band Operation

For two-band operation on either 20 or 40 meters a modification of the double doublet is recommended as indicated in Fig. 2.

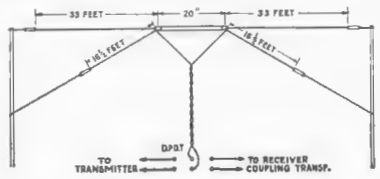


Figure 2

For operation on 40 meters the 33 foot sections become a current-fed Hertz with proper impedance match and will draw power from the plate tank circuit. The 16½ feet sections are electrically eliminated due to the fact that they would be ⅛ wave length long and at point of feeder contact the impedance would be mismatched to the point which would preclude their taking power.

For operation on 20 meters the reverse is true, the 16½ feet sections being at resonance and the 33 feet sections at a current node at point of feeder contact, impedance being too high to take power.

It will be noted that the conventional transposed method of erecting double doublet antenna has been slightly modified to make it suitable for use as a radiator. This is done by eliminating the center transposition block and folding each 16½ feet section back on the 33 feet section at an approximate 45 degree angle. This modification has no effect on the doublets as a noise reducing system for receiving at the amateur frequencies used.

THIS MONTH'S POSTCARD

. . AND GO PLACES

That's what your radio set will do if it is connected to a modern scientific antenna system. You'll be surprised what a difference it will make—more stations and less noise. We know our antennas. Let us show you what an RCA World-Wide Antenna System will do for your set. Price $6.00 plus installation.

Your Imprint Here

Above is shown in reduced size a postcard that has what it takes to get real inquiries from a mailing list. Note the large space for imprint. Stamped and imprinted, these cards cost only $1 per 100 from RCA Parts Distributors, or direct from Advertising Department, Camden, N. J. Ask for Postcard Form No. 143.

METAL TUBES COMING INTO GENERAL USE

New Welding Process and New Alloy Used In New Tubes

Use of the new RCA All-Metal Tubes by a great majority of set manufacturers in their 1936 receiver lines presages their universal use in the very near future, according to the opinion of experienced trade observers. Improved performance, quieter operation, elimination of shielding, and reduction in space requirements are but few of the many advantages of these remarkable tubes.

Hailed as the greatest radio tube advance in 28 years, RCA All-Metal Radio Tubes are endorsed by two great names. They were designed by General Electric and are manufactured by RCA.

Basic New Design

RCA metal tubes are of a basic new design, not to be confused with any previous type of tube, manufactured either in this country or abroad. Their existence is entirely due to basic new developments in metallurgy and in the art of welding. A new metal, "Fernico," which has the same coefficient of expansion as glass, was developed to permit the use of glass insulation where the lead wires enter the metal shell. New welding methods which use Thyratron control tubes permit welding currents as high as 75,000 amperes for the short interval of 1/30 of a second. Such a weld is used for sealing the base to the envelope, without affecting the metal in any injurious manner.

RCA metal tubes are not directly interchangeable with existing RCA glass tubes. However, some have the same general characteristics. Because of the few types, service engineers should familiarize themselves with the type numbers and general characteristics. Also a new universal type base and pin numbering arrangement are used, further standardizing important information.

Heat Dissipation

RCA Metal Tubes dissipate the same amount of heat as glass tubes. However the heat is concentrated over a smaller area because of the smaller size of the envelope. Because the cathode or filament is not visible, checking each tube for heat dissipation is the easiest method of testing for open heaters.

Base Connections

A new universal type base is used on all metal tubes, thereby enabling set manufacturers to standardize on one type of socket for all tubes. While the pins are standardized as to position and connection, the number of pins in a particular tube varies because of the variation in number of elements. The bases of all metal tubes have in the center an "alignment plug" which is keyed to fit a hole in the socket, the position of the key guiding the prongs of different type tubes into the correct holes in the universal socket.

WEAPON DETECTOR IS NEW RADIO DEVICE

Radio Now Put To Use for Watchmakers Also

Philadelphia, Pa. — Radio principles applied to widely separated fields by the RCA laboratories have made possible the development of two remarkable detecting devices. One is a watch analyzing mechanism which checks timepieces and automatically prints a case history picture of any trouble, and the other is a "weapon detector" system for prisons which automatically sets off an alarm when it is attempted to smuggle in weapons.

The watch analyzing device, named a Chronograph by its sponsors, was described in a joint paper presented before the Institute of Radio Engineers (Thursday, May 2) by Charles J. Young and Maurice Artzt, RCA Victor research engineers from Camden, N. J. Dr. David Luck, also of the RCA Victor laboratories, delivered the paper on the "gun detector" device and was assisted by Ray G. Shankweiler in a working demonstration of the apparatus.

The new weapon detector foils jailbreakers by detecting any metal weapons accomplices might be carrying as they pass the device.

Radio "Gun Detector"

Following Dr. Luck's technical description of the "weapon detector" an actual demonstration of the device was staged for the benefit of the engineers. A specially constructed door passageway was brought into the room, and a man with a concealed revolver walked through. Instantly, as he stepped over the threshold, a warning red light flashed on at the operator's control box. It was explained that the mechanism might be adjusted to set off an alarm, turn on flood lights, or automatically shut the door leading from the room. The system consists mainly of three parallel loops concealed in the framework of the doorway, and connected to a control box. A flow of voltage set up in the center, or driver loop, is picked up by the two outside loops, spaced at equal distances apart to create a perfectly balanced circuit. The introduction of a metallic object such as a gun, file, or a knife will upset the delicate balance of the circuit, and cause an alarm to be given. The device is absolutely harmless and, unless it is desired, persons passing through will not know they are being examined.

MAGIC EYE ONE OF MANY NEW FEATURES OF RCA VICTOR SETS

1935-36 Uses Metal Tubes; Has Unique Dial and Twelve-Inch Speakers

New tubes, new cabinets, new circuits and the sensational new Magic Eye are but few of the many new features of the 1936 line of RCA Victor receivers shown at an enthusiastic RCA Victor distributors' meeting held in Atlantic City, N. J., July 18 and 19. "The best line produced by RCA" was the remark heard on all sides as the receivers were displayed and demonstrated. For the service engineer, the new sets offer many new innovations, some never before used in any receivers.

Metal Tubes

Metal tubes are used throughout the new line, except in the very lowest priced merchandise. The use of metal tubes contributes greatly to the performance of these receivers because of their high efficiency, perfect shielding and quietness of operation. Metal tubes are unquestionably one of the greatest advances in radio, comparable to the dynamic speaker and AC set.

Wide Tuning Range

New tuning ranges go from the usual broadcasting band to the ultra-high frequencies up to 60 megacycles. The high efficiency of the metal tubes gives exceptional performance at these extremely high frequencies. Transceiver conversations, terra-wave police calls and other interesting broadcasting are easily tuned in.

The Magic Brain unit is similar to that of previous models except that it has been improved in a number of ways. A separate oscillator tube and a new circuit give extreme stability to the circuit over a wide range of voltage fluctuations, thereby eliminating the need for retuning on the high frequency bands. All connections in the Magic Brain are made with bus-bar, assuring rigidity and permanence of adjustment. Use of the new RCA-6L7 as the first detector further improves the performance of the Magic Brain unit because of its remarkable mixing efficiency at high frequencies.

Handsome Dials

Two new dials are used, one the Color Band Dial, similar to last year's but having the bands indicated in color, and the other, the Selector Dial, which changes scales automatically for each band. The Color Band Dial is used on the lower priced models while the Selector Dial is used on the higher priced models. The Selector Dial, showing only the actual band in use at any one time, is a great improvement over existing dials for multi-band receivers.

Magic Eye

Probably the most remarkable feature of the new RCA Victor receivers is the Magic Eye. This is actually a very sensitive and practical tuning indicator utilizing a special cathode ray tube. This tube is known as the RCA-6E5, having the usual elements of a triode plus a conical plate at the end. A control electrode is arranged to deflect the electron beam, thereby causing a triangular shadow on the fluorescent screen. Operation of the Magic Eye is secured through connection of the control electrode to the automatic volume control circuit.

Above is shown the handsome control panel of one of the new RCA Victor receivers. Note the Magic Eye and the easily-read Selector Dial.

Twelve Inch Loudspeakers

All console models employ new 12-inch dynamic loudspeakers. While there is a variation in the field size in different models, both sizes give greatly improved tone quality and greater volume. Improved response is especially noticeable at low frequencies.

COUPON OR POSTCARD WILL BRING "NEWS" TO YOU REGULARLY

The response to the subscription postcard enclosed with the last issue of RCA Radio Service News left no doubt that service engineers the country over want to make sure that they do not miss a single issue. RCA Radio Service News is sent free to any service engineer or dealer requesting it. RCA Parts distributors receive small quantities for mailing or over-the-counter distribution, but the sure way to get the paper is to get on the factory mailing list.

Requests to be put on the mailing lists should be addressed to RCA Radio Service News, Camden, New Jersey. Just write, "Put my name on your mailing list for RCA Radio Service News" on a postcard, or use the coupon below.

Cards Received Without Names

If you sent in the postcard which was enclosed with the last issue, your name is now on the mailing list—unless you were one of those absent-minded persons who mailed the card without filling in the space for your name and address.

Misunderstanding as to the terms of the free subscription offer contained in the last issue were responsible for many tributes to the popularity of RCA Radio Service News. Several persons enclosed dollar bills instead of the one cent stamp affixed to the card which was all that was required. From far away Chile came two beautiful 50 centavo Chilean postage stamps that might have been a credit to any stamp collection. A subscription from Johannesburg, South Africa, was relayed through an international commercial magazine subscription agency.

Ask For Them—They're Free

Here's the way one enterprising Texas service engineer uses RCA Radiotron spare tube clips to keep his bench neat. Or tacked inside the cabinet of sets that have been serviced, they make it much easier to sell extra tubes. Any service engineer can get a supply absolutely free, no strings attached, by just writing a postcard to RCA Radiotron Warehouse, 589 East Illinois St., Chicago, Ill. Just say, "Please send me some spare tube clips."

Ham Crystal Uses New Cut

Improved Crystal Benefits Amateur Stations

A new crystal, made from an entirely new cut, has recently been announced by the RCA Amateur Radio Section to amateurs and experimenters for transmitters application. A new ceramic crystal holder operating on new principles also has been announced, giving a combination that is unapproached in frequency stability.

Because of the necessity of calibrating the crystal in the holder with which it is to be used, the crystal is sold only complete with the holder at the remarkably low amateur net price of $12.00. The holder alone may be obtained for $2.50, net.

RCA RADIO SERVICE NEWS
Camden, New Jersey

Please put my name on your mailing list to receive RCA Radio Service News. I am

☐ An Independent Service Engineer ☐ A Licensed Amateur
☐ A Service Engineer for Set Dealer ☐ An Experimenter
☐ .....

Name .....

Firm Name .....

Street .....

City and State .....

MAGIC EYE IS A FEATURE OF NEW RCA SETS

(*Continued from page* 1, *column* 3)

Service engineers will recognize the Magic Eye as a new, small cathode ray tube combined with an internal amplifier.

Only the screen of the tube, about one inch in diameter, is visible on the control panel of the receiver. It is shaded by a small hood resembling an eye-lid and giving the device a startling resemblance to a human eye. Hence the name "Magic Eye" which has been given to the device.

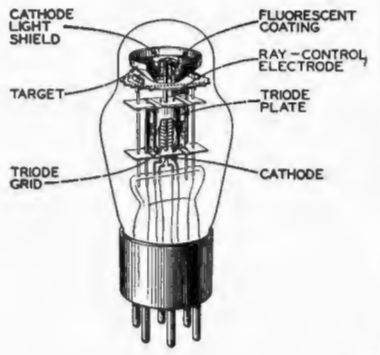


FIG. 1

Old timers of the radio trade who have seen the Magic Eye in operation, and also have seen and heard about the great advertising campaign which RCA Victor has scheduled to popularize its new feature, predict that before the Fall radio season is half over the public will be as interested in the Magic Eye as they have been in the Magic Brain which was the most talked of radio advance of last year.

Sell 'em Sound

Almost any business is a prospect for an RCA Victor Sound System, according to Hatry and Young of Hartford, Conn., who are enterprising distributors for RCA Parts as well as Sound Systems. In the job, shown above, they made it possible for the 'phone operator of an auto service store to be heard in any part of the plant. The restaurant call system shown in the last issue was another notable Hatry and Young job.

Small Cathode Ray Tube

The Magic Eye tube is known as the RCA-6E5 Electron-Ray Tube. The 6E5 is a high-vacuum, heater-cathode type of tube designed to indicate visually the effect of change in the controlling voltage.

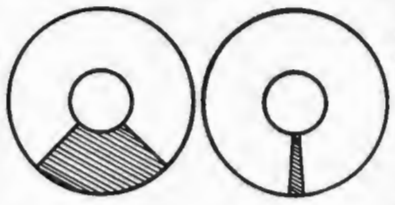
The visible effect is observed on a fluorescent target located in the dome of the bulb. For different controlling voltages, the pattern on the target varies through a shaded angle from 90° to approximately 0°. Exact tuning is indicated by the narrowest shaded angle obtainable.

The RCA-6E5 provides a convenient and non-mechanical means to indicate accurate tuning of a receiver to the desired station.

Electron Ray Tube Considerations

In the basic design of an electron ray tube, a hot cathode provides a source of electrons. These are attracted to a positively-charged target coated with a fluorescent material. Electrons impinging on the coated target cause it to glow. The extent of the fluorescent area can be controlled by means of a third electrode between cathode and target. The pattern developed on the target depends on its contour as well as on the shape and position of the third electrode.

Details of the physical arrangement of electrodes are illustrated in Fig. 1 which shows a cut-away view of the RCA-6E5. The third electrode



Out of Tune In Tune

Figure 2

is identified as "ray-control electrode," and is an extension of the triode plate. The visible effect produced by different voltages on this electrode is shown for two adjustments by the shaded areas of Fig. 2. The voltage on the ray-control electrode is determined by the voltage applied to the grid of the triode connected as a d-c amplifier. A series resistor of one megohm is placed between the triode plate and the high voltage supply to which the target is directly connected, as shown in Fig. 3.

The effect of the series resistor is to reduce the voltage applied to the triode plate, and consequently to the ray-control electrode, under conditions of decreased triode-grid bias (increased triode-plate current).

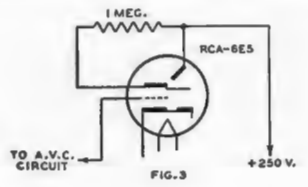


FIG. 3

For conditions of increasing triode-grid bias (decreasing triode-plate current), the triode-plate voltage increases and approaches the value of the supply voltage.

In the practical use of the RCA-6E5 as a tuning indicator, controlling voltage applied to the triode grid is obtained from a suitable point in the a.v.c. circuit.

Makes Any Set a C-W Receiver

With the little device shown above hooked to an ordinary home receiver of the superheterodyne type, all the fascinating C-W code signals can be heard. Connections are easily made by single adaptors for the tube prongs. Its frequency range is 415 kc. to 700 kc. RCA Parts distributors list it at $7.50.

RECEIVE C-W CODE SIGNALS WITH NEW BEAT OSCILLATOR

(*Continued from page* 1, *column* 4)

adjusting its frequency to give the desired beat note.

The heterodyne method of reception of C-W signal functions on the principle of mixing two R.F. frequencies that are separated by an audio frequency difference so that the resultant beat note is within the range of the human ear. Such reception in a super-heterodyne receiver is accomplished by beating the intermediate frequency signal with an external signal. The beat note is then extracted by the detector and provides an audible note which may be heard. The frequency of this note may be changed by shifting the R.F. frequency of the external oscillator.

A feature of the oscillator is its adaptability to either 6.3-volt or 2.5-volt tubes. The list price is $7.50.

MEETINGS SCHEDULED

(*Continued from page* 1, *column* 1)

Washington	9/6	10/11	11/15
Norfolk	9/10	10/15	11/19
Richmond	9/12	10/17	11/21
Southeastern District			
Charlotte	8/23	9/24	10/29
Atlanta	9/12	9/26	10/31
Nashville	8/26	10/1	11/4
Birmingham	8/28	10/3	11/6
Tampa	9/3	10/8	11/12
Miami	9/5	10/10	11/14
Jacksonville	9/9	10/14	11/18
Central District			
Milwaukee	9/19	?	?
Minneapolis	8/21	9/25	10/30
Chicago	9/9	9/27	11/1
Grand Rapids	8/27	10/1	11/5
Detroit	8/29	10/3	11/7
Toledo	9/3	10/7	11/12
Columbus	9/4	10/9	11/13
Cincinnati	9/6	10/11	11/15
Louisville	9/16	10/14	11/18
Indianapolis	9/11	10/16	11/20
Peoria	9/20	10/18	11/22
Kansas City District			
St. Louis	9/16	?	?
Kansas City	9/13	10/1	11/5
Des Moines	8/29	10/3	11/7
Omaha	9/3	10/7	11/12
Sioux City	9/4	10/9	11/13
Lincoln	9/6	10/11	11/15
Denver	9/10	10/15	11/19
Southwestern District			
Dallas	9/3	9/23	10/28
Ft. Worth	9/4	9/25	10/30
San Antonio	9/6	9/27	11/1
Houston	9/9	10/1	11/5
New Orleans	9/11	10/3	11/7
Oklahoma City	9/16	10/8	11/12
Little Rock	?	?	?
Memphis	?	?	?
San Francisco District			
Oakland	8/23	9/27	11/1
San Francisco	8/21	9/25	10/30
Portland	8/27	10/1	11/5
Seattle	8/29	10/3	11/7
Spokane	9/3	10/7	11/12
Salt Lake City	9/6	10/11	11/15
Sacramento	9/9	10/14	11/18
Fresno	9/11	10/16	11/20
Los Angeles District			
Santa Barbara	8/19	9/23	10/28
Los Angeles	8/21	9/25	10/30
San Diego	8/23	9/27	11/1
San Bernardino	8/27	10/1	11/5
Long Beach	8/29	10/3	11/7