



RADIO SERVICE NEWS

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

JANUARY, 1936

CAMDEN, NEW JERSEY

Vol. 2, No. 4

NEW PLAN HELPS ENGINEERS

RIDER ENDORSES RCA THREE POINT SERVICE SYSTEM

Author of Rider's Manuals Says
New Plan Embodies Three
Principles of Success

BY JOHN F. RIDER

It is axiomatic that success is often founded on failure. All men can profit by the mistakes of others.



John F. Rider

It is particularly true of the radio servicing industry that, to the lack of business acumen—more than any other single factor—can be attributed the unduly high business mortality among radio service organizations. We realize that technical knowledge is the basis on which the serviceman builds his income. However, we emphatically state that all of the technical knowledge in the world is of no avail in the successful growth of a radio service business, unless it is definitely tied in with proper business administration.

Embodies Three Principles

The RCA Three-Point Plan, embodying as it does the three cardinal principles of success in a radio servicing industry—namely, technical information, proper merchandising information and business administration information—is a notable step forward.

I hope that every serviceman will take these words to heart and, keeping in mind the business failures among his colleagues due to lack of proper business methods, will resolve to apply the information contained in the Three-Point Plan to his business—WHILE HE STILL HAS A BUSINESS.

Makes Picture



Beautiful Jane Froman, popular radio star, has just finished her first moving picture, "Stars Over Broadway." Her return to the radio networks will be eagerly awaited by thousands of fans.

Uses RCA Tip File



Walter Tracy, an outstanding engineer of the Buder Radio Company of St. Louis, Mo., is looking up a hot service tip on an unfamiliar set in the RCA Radio Service Tip File. Mr. Otto Buder, president of the firm, is very enthusiastic about the RCA Three-Point Service System and believes every service engineer should have it.

RCA SERVICE MEETINGS TO RUN IN 1936

New Schedule Announced For Next Three Meetings

Continuation of the popular RCA Service Meetings during the Spring of 1936 has just been announced by F. B. Ostman, Manager of the RCA Service Division. "The tremendous popularity of the Fall series of meetings has shown us how the service engineer appreciated RCA's efforts to help him," said Ostman, "and the new series will be even better than the last and will be along more practical, rather than theoretical lines."

Subjects Announced

The tentative subjects for the new series, which are called Meetings X, XI and XII are as follows:

Series X—Measuring LCR with the RCA Universal Bridge and the RCA Three-Point Service System.

Series XI—Commercial Sound Systems and the RCA Three-Point Service System.

Series XII—Auto Radio—Design, Installation and Service.

The subjects chosen are very timely for all service engineers. New Test Equipment is necessary to keep up with the latest receiver design, Commercial Sound Systems help service engineers cash in on this profitable market and Auto Radio is an ever-profitable field for service engineers. The schedule for (Continued on Page 2, Column 2)

From N. Y.—I.R.S.M.

"The new RCA Three-Point Service System seems to me to be a combination of the three most helpful aids that the service man requires today."

Fred L. Horman,
Chairman, Second Region,
Institute of Radio Service Men.

RCA 3-POINT SERVICE SYSTEM COVERS BUSINESS ESSENTIALS

Service Tips File and Two Books Show Ways of Profitable Operation of Radio Service Business

A more profitable business, more time for study and recreation and a higher standing in the service profession await the service engineer who uses the RCA Three Point Service System, three highly useful business helps now being offered by RCA Parts distributors. This unique plan supplies the three fundamental requirements for business success—technical knowledge, sales ideas and a basis for profitable operation. Through a special plan, the entire system may be obtained for only \$1.50—a sensational value.

The RCA Three Point Service System shows the way to a successful service business by using the combined experience of hundreds of service engineers. It contains only facts and methods that have proven successful in actual field operation, no idle theories or claims.

Essentially, the RCA Three Point Service System consists of a Service Tip File, containing initially two hundred selected service tips, a booklet entitled "101 Service Sales Ideas," and a booklet, "Radio Service Business Methods," by John F. Rider and J. Van Newenhizen.

Tip File

The RCA Radio Service Tip File supplies the missing link in thousands of service engineers' professional equipment—practical experience. The service tips have been carefully selected from those submitted by the readers of RCA Radio Service News. They cover the more difficult phases of service work, intermittent operation, special equipment for saving time and hundreds of other subjects. With the Service

Tip File, the service engineer is immediately placing the experience of hundreds of other engineers at his disposal. Supplementing the 200 tips initially supplied with the file, additional tips are available in packet form—each packet containing 20



RCA 3-Point Service System

selected tips. These packets will continue to be available for an indefinite period at all RCA Parts distributors on a special plan.

Steel Filing Case

The handsome steel filing case of (Continued on Page 2, Column 3)

ARE YOU INVITED?—An Editorial

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

For every person who needs radio service and knows that he needs it, there are a dozen persons who need radio service and do not know that they need it. On this simple fact the entire sales strategy of radio service engineers should be based.

It is all well and good to be sure you get your share of the business of those who know they need radio service, but the radio service profession as a whole will make more money if it spends more of its sales promotional efforts on those who need radio service but do not know it. Finding them is not hard, and convincing them is easy—if you can get into contact with the set.

* * * *

The sales problem of service engineers is to get into contact with the set; in other words, to get into the home.

One way to get into the home is house-to-house canvassing. If you try it you'll call on a few people who do not need radio service; you'll meet some who do not like canvassers; you'll get a lot of doors slammed in your face; but you'll get a lot of business.

* * * *

Another way is to get yourself invited into the home. This method eliminates those who do not need radio service. It saves time. It assures a cordial welcome. This is the method used in the Check-Up Campaign now being fostered by RCA Radio Tube distributors.

The check-up method has the added advantage of paying you \$1.50 for accepting the invitation into the home. Experience indicates that you can expect an average of \$4.65 in sales for each invitation you accept.

The check-up may look like \$1.50 per call to some, but it looks like \$4.65 per call to hundreds of service engineers who have used it.



F. B. Ostman

NATION-WIDE AUTO DEPOTS ESTABLISHED

RCA Service Division To Appoint Better Service Stations

An expanded, nation-wide RCA auto radio installation and service system is now being established, according to P. H. Jeryan of the RCA Service Division. "RCA is convinced that an auto radio requires special attention for trouble-free performance and the establishment of such stations is the first step in that direction," continued Jeryan. Not only will these stations have special preference in the performance of RCA auto service work, but they will receive many helps from RCA such as technical literature.

Offers Opportunity

An unusual opportunity for service engineers who have shops suitable for this type of work is offered in the establishment of this system. Installation work of all RCA dealers and distributors will be handled by such stations. Also, direct sales in many cases may be made because of the reputation that will be established through such an appointment.

Requires Technical Qualifications

In general principles the auto receiver is identical with the home receiver. However, the conditions under which the former has to operate differ considerably from those of the home receiver and often such conditions cause imperfect reception. In recent years these difficulties have been overcome, one by one. Last year, for example, eliminating the spark plug suppressors resulted in the better efficiency of the engine at higher speeds. The car manufacturers also have done their share by giving full consideration to radio requirements.

There are, however, certain difficulties which, at times, still exist in the installation and service of the auto receiver. In the case of the car, defective ignition systems, improper timing, loose connections in the electrical system and other defects will result in the noisy reception of the receiver. The requirements of an auto radio installation and service station will therefore include an elementary knowledge of the automobile, especially of the ignition system, as well as a good understanding of radio principles and the necessary instruments, tools and other facilities.

Conditions for Appointment

The fundamental requirements for appointment as part of the RCA Auto Radio Service System are:

1. A good knowledge of radio principles, aligning and repairing.
2. An elementary knowledge of the automobile, especially of the ignition system.
3. The necessary electrical instruments, tools and other installation facilities.

The RCA Service Division invites all stations equipped with these facilities to apply for appointment in this network. Address all communications to Mr. P. H. Jeryan, Service Division, RCA Manufacturing Co., Inc., Camden, N. J.

This Is What You Get

In the RCA Three-Point Service System

1. The RCA Radio Service Tip File, including steel cabinet, Index Cards, and 200 Tip Cards Value \$5.00
2. Radio Service Business Methods, by John F. Rider and J. Van Newenhizen (available about March 1, 1936) Value 3.00
3. 101 Service Sales Ideas, a 48-page book. Value .75

PLUS—Additional Tip Cards in packets of 20 as you earn them \$8.75

An \$8.75 Value for \$1.50

with purchases of \$60.00 worth of RCA Parts
See story, page 5, col. 5

RCA SERVICE MEETINGS TO RUN IN 1936

(Continued from page 1, column 2)

these meetings has been tentatively set although it is advisable to first check your RCA Parts Distributor for a confirmation of the date.

City and State	X	XI	XII
Akron, Ohio	2-3	3-9	4-13
Albany, N. Y.	2-7	3-13	4-17
Allentown, Pa.	2-5	3-4	4-2
Altoona, Pa.	2-7	3-6	4-10
Amarillo, Texas	1-20	2-24	3-30
Atlanta, Ga.	1-22	2-26	4-1
Baltimore, Md.	1-28	3-3	4-7
Birmingham, Ala.	1-28	3-3	4-7
Boston, Mass.	1-31	3-6	4-10
Bridgeport, Conn.	1-30	2-28	4-28
Buffalo, N. Y.	2-13	3-19	4-23
Canton, Ohio	2-5	3-11	4-15
Chicago, Ill.	2-18	3-27	4-28
Charleston, W. Va.	2-18	3-17	4-14
Charlotte, N. C.	1-20	2-24	3-30
Cincinnati, Ohio	2-5	3-11	4-15
Clarksburg, W. Va.	2-7	3-6	4-3
Cleveland, Ohio	2-11	3-17	4-21
Columbus, Ohio	2-3	3-9	4-13
Dallas, Texas	2-13	3-19	4-23
Davenport, Iowa	1-30	3-5	4-9
Dayton, Ohio	2-10	3-11	4-9
Denver, Colo.	2-11	3-17	4-21
Des Moines, Iowa	2-3	3-9	4-13
Detroit, Mich.	1-29	3-4	4-8
Duluth, Mich.	2-21	3-20	4-17
El Centro, Calif.	...	2-26	4-8
Elmira, N. Y.	2-14	3-20	4-24
El Paso, Texas	2-13	3-12	4-10
Erie, Pa.	1-27	2-28	4-29
Escanaba, Mich.	2-7	3-6	4-3
Ft. Worth, Texas	2-11	3-17	4-21
Fresno, Calif.	2-11	3-17	4-21
Grand Rapids, Mich.	1-27	3-2	4-6
Harrisburg, Pa.	2-7	3-5	4-8
Hartford, Conn.	1-24	2-28	4-3
Houston, Texas	2-5	3-11	4-15
Huntington, W. Va.	2-17	3-16	4-13
Indianapolis, Ind.	2-11	3-17	4-21
Jacksonville, Fla.	2-5	3-11	4-15
Johnstown, Pa.	2-20	3-26	4-23
Kansas City, Mo.	1-22	2-26	4-1
Knoxville, Tenn.	2-6	3-5	4-6
La Crosse, Wisc.	2-14	3-13	4-10
Lima, Ohio	2-20	3-19	4-17
Lincoln, Nebr.	2-7	3-13	4-17
Little Rock, Ark.	1-28	3-3	4-7
Long Beach, Calif.	1-30	3-5	4-16
Los Angeles, Calif.	1-29	3-4	4-5

RCA SERVICE SYSTEM USES THREE ITEMS

(Continued from page 1, column 5)

the RCA Service Tip File is built to give a lifetime of service. It has electrically welded corners to insure strength and rigidity, a positive drawer follower block and a return flange front which also acts as a drawer stop. A total capacity of 1200 cards, 3" x 5", insures ample room for many additional tips. The entire box is finished in a handsome deep green lacquer with red and gold lettering—a worthy addition to all service engineers' equipment.

101 Ideas

"101 Service Sales Ideas" is a booklet containing exactly what the



Proven Selling Helps

name implies—101 proven ideas for increasing service sales. While not all of the ideas may work in every locality, some of them will and all of them have produced results. These ideas are not technical suggestions, but are ideas for promoting the service business—ideas that make two dollars grow where one grew before. Inclusion of a catalog of all RCA sales helps make this

book particularly valuable for those who need additional publicity material.

Business Methods

"Radio Service Business Methods," by John F. Rider and J. Van Newenhizen is perhaps one of the most valuable contributions yet to be made to the service industry. It strikes at the basis of the greatest evil of the radio service industry—lack of profitable operation. While hundreds of service engineers have all the work they can do, nevertheless they are not making a profit or even a good living. "Radio Service Business Methods" shows where the weaknesses of unprofitable operation lie—where lost profits occur and how they should be remedied. Mr. John F. Rider needs no introduction to the service industry. He is personally known to thousands of service engineers throughout the country, through his books, his lectures and his magazine articles. To his wonderful understanding of the radio service business is added the cost accounting knowledge of Mr. J. Van Newenhizen of the RCA Manufacturing Company, an auditor and accountant of many years' standing. Mr. Van Newenhizen has personally put many radio dealers and distributors on a profitable operating basis by installing simplified cost systems, designed for the radio business. The combination of these two great minds on the service business is an outstanding contribution to the welfare of all radio service engineers.

RCA Parts distributors are now featuring the RCA Three Point Service System on a special deal that enables the service engineer to obtain the complete System including 300 Service Tips for \$1.50—less than the cost of the metal filing cabinet alone.

(See page 5, column 5, for details)

RCA INSTITUTES GRADUATES FIT IN SERVICE JOBS

Technically Qualified Men Available Throughout Country

Technical experts of assured abilities for all kinds of radio work and in almost all parts of the country can be obtained through RCA Institutes, 75 Varick St., New York City, according to W. F. Aufenanger, superintendent. Dealers, service organizations and industrial firms are invited to correspond with the Institutes when in need of well-trained men.

The lists maintained by Mr. Aufenanger include men who have had intensive laboratory training, with all types of equipment and under personal direction of instructing engineers at either the New York or Chicago school or in the Home Study Courses of RCA Institutes. Sound experts and men capable of installing and maintaining electron tube devices for varied industrial purposes are available. A number of these men are college graduates while others have field experience. Mr. Aufenanger's staff is prepared to report on the student's general characteristics, including adaptability, capability, industry, personality and regularity. These men are located in different parts of the country, quite convenient for interviews, which, of course, are always without obligation.

Any one requiring the services of such men should address an inquiry to Mr. W. F. Aufenanger, 75 Varick St., New York City.

Advantageous



Wm. Irlam, Secretary of the Radio Service Men's Association of Pittsburgh, Pa., believes the RCA Three-Point Service System will be the most advantageous set-up of its kind in existence.

About Books

MODERN RADIO SERVICING By A. Ghirardi

Reviewed By J. K. Whitteker
Chief Instructor, RCA Institutes, Inc.
75 Varick St., N. Y. C.

"Modern Radio Servicing," by Alfred A. Ghirardi is a most excellent text and handbook for the professional service man.

It is logically divided into three sections, the first of which covers measuring and testing equipment and its applications. This section is one of which the author may feel justly proud, not only from the standpoint of scope, but the up-to-dateness of the equipment covered as well.

The second section is devoted to a description of the special circuits of radio receivers, such as automatic volume control and quiet automatic volume control circuits. This section also includes many hints on tests and trouble shooting as well as alignment of the more modern types of radio receivers. Special hints on repairs and the location of obscure troubles are given satisfactory treatment.

The third section is devoted mainly to installation, covering, in Mr. Ghirardi's excellent style, such items as auto radio receivers, all-wave receivers, receivers for pleasure boats, as well as a chapter on the reduction of electrical interference.

This is an ideal companion volume to the author's book, "Radio Physics Course," and should be in the library of every service man.

X-Ray Ad

Improve Your Radio



Have It X-RAYed

With our RCA Oscillograph. Quicker, better work, less expense.

New life to any radio with genuine RCA Tubes. **59c**
From 59c up

RCA-Victor RCA Headquarters

DENTON COTTIER & DANIELS

COURT STREET at PEARL
Music Center of Western N. Y.

A sure way of cashing-in on ownership of the RCA Cathode Ray Oscillograph is to advertise it in local newspapers. Denton, Cottier and Daniels of Buffalo, N. Y., believe it pays to advertise.

"Line" Service Bench



A feature of the excellent service facilities offered by Shannon Radio Service, 73 South Third Ave., Mount Vernon, N. Y., is the line production method of handling receivers.

Louisville, Ky.	2-7	3-13	4-17
Madison, Wisc.	2-17	3-16	4-20
Manchester, N. H.	2-3	3-3	4-2
Memphis, Tenn.	1-30	3-5	4-9
Milwaukee, Wisc.	1-24	2-28	4-3
Minneapolis, Minn.	1-20	2-24	3-30
Montgomery, Ala.	2-10	3-9	4-10
Nashville, Tenn.	1-24	2-28	4-3
Newark, N. J.	1-20	2-24	3-30
New Bedford, Mass.	2-14	3-12	4-13
New Haven, Conn.	2-3	3-2	4-3
New Orleans, La.	2-3	3-9	4-13
New York, N. Y.	1-22	2-26	4-1
Norfolk, Va.	1-20	2-24	3-30
Oakland, Calif.	1-24	2-28	4-3
Oklahoma City, Okla.	1-22	2-26	4-1
Omaha, Nebr.	2-5	3-11	4-15
Peoria, Ill.	2-13	3-19	4-23
Philadelphia, Pa.	2-18	3-24	4-28
Pittsburgh, Pa.	1-30	3-5	4-9
Portland, Maine	2-4	3-10	4-14
Portland, Ore.	1-28	3-3	4-7
Providence, R. I.	1-29	3-4	4-8
Richmond, Va.	1-22	2-26	4-1
Roanoke, Va.	2-7	3-6	4-7
Rochester, N. Y.	2-11	3-17	4-21
San Antonio, Texas	2-7	3-13	4-17
San Diego, Calif.	1-24	2-28	4-10
San Francisco, Calif.	1-22	2-26	4-1
San Jose, Calif.	1-20	2-24	3-30
St. Louis, Mo.	1-28	3-3	4-7
Salt Lake City, Utah	2-7	3-13	4-17
Seattle, Wash.	1-30	3-5	4-9
Shreveport, La.	2-24	3-23	4-22
Sioux City, Iowa	2-20	3-19	4-21
Sioux Falls, S. Dak.	2-14	3-12	4-13
Spokane, Wash.	2-3	3-9	4-13
Springfield, Ill.	2-25	3-24	4-21
Springfield, Mass.	1-27	3-2	4-6
Springfield, Mo.	1-24	2-28	4-3
Syracuse, N. Y.	2-10	3-16	4-20
Tampa, Fla.	1-31	3-6	4-10
Toledo, Ohio	1-31	3-6	4-10
Topeka, Kan.	2-10	3-9	4-8
Tulsa, Okla.	1-24	2-28	4-3
Washington, D. C.	1-24	2-28	4-3
Watertown, N. Y.	2-7	3-6	4-8
Wheeling, W. Va.	2-14	3-13	4-17
Wichita, Kan.	1-20	2-24	3-30
Wilkes-Barre, Pa.	2-18	3-17	4-17
Wilmington, Del.	2-14	3-13	4-15
Worcester, Mass.	2-27	3-26	4-24
Youngstown, Ohio	2-7	3-13	4-17

BOOK ON BUSINESS METHODS SHOWS HOW TO STOP LOSSES

Simplified Cost Accounting And Business Procedure Shown In Remarkable Book By John F. Rider and J. Van Newenhizen

A really "Prosperous New Year" awaits the service engineer who puts his business on a sound financial basis through applying the principles of a remarkable new book soon to go to press under the sponsorship of Mr. John F. Rider.

The dean of the Radio Service Industry has studied the problem of a better financial status for service engineers for a number of years. After studying thousands of service businesses throughout the country, he has combined his findings with the technical knowledge of Mr. J. Van Newenhizen, an auditor and accountant of many years' experience in solving radio dealers' record-keeping problems. The result is perhaps the greatest help ever provided for the radio service engineer. It is called "Radio Service Business Methods."

Mr. Rider's study has shown that thousands of efficient engineers have all the work they can do but still do not make a profit. In many cases, they do not even make a comfortable living. The reason, easily understood under proper analysis, is that most service engineers have

how a radio service business may be made a profitable business. It has been written after a study of service shops that ranged in size from the individual operating from his home to the large city business which employs many engineers. The basic principles upon which the successful businesses operate and the weaknesses of the unsuccessful ones are outlined in such a manner that they may be applied to any business. Complete data is included and all necessary forms are illustrated so that the results may be immediately applied.

Thorough Treatment

Service engineers, dealers and distributors who have read the manuscript of the Rider-Van Newenhizen book have commented on the fact that not only is the subject treated in a thorough and easily understood manner, but that all non-essential records have been eliminated. The bookkeeping method suggested is simplicity itself, yet provides adequate facts for the operation of any radio service business from the one man business to the proprietorship employing others and selling set and appliances.

"Radio Service Business Methods" will be off the press about March 1, and will be distributed at once to all who have subscribed to the RCA Three Point Service System.

Mr. Naylor comes one from Mr. A.R. Abendschoen of South Orange, N. J. Mr. Abendschoen wrote:

"Just what I needed. The RCA Service Tip File saves much time and headaches.

"Congratulate RCA for offering such help to the service man.

"With this File and the Oscillograph and the rest of the Test Equipment that I have just purchased, I feel confident that I am in a position to service any and all makes of radios properly and completely."



Tells how to eliminate losses.

been concerned with the technical side of the business almost to the exclusion of the financial side.

However, a few shining exceptions to the rule—a handful of service engineers who do make a real profit—are proof that if properly conducted, the radio service profession is a lucrative one. And analysis shows that these few are first and foremost good business men, and secondly good service engineers.

"Radio Service Business Methods" tells in an easily understood manner

SERVICE MEN PRAISE RCA 3-POINT PLAN

Great Assistance To All Service Men, Says Newark Engineer

That the RCA Three-Point Service System is just what the radio service industry needs is amply shown by the many letters being received by the RCA Parts Division in Camden. The first to arrive was from H. L. Naylor, Manager of the Krich-Radischo Service Dept. in Newark, N. J. To quote Mr. Naylor:

"It is with great pleasure that I heard the announcement by RCA Manufacturing Company of the introduction of their Radio Tip File.

"I have personally made up and used a file along these lines for a number of years and I know the extreme value that these are to service men.

"They will also be of great assistance to any service man working on a set with which he is not familiar as so many of the service jobs of today are repetitions of a like condition.

"All worthwhile service men will grab this item in a hurry."

And on top of the letter from

"CHECK-UP" IS BUSINESS HELP, REPORTS KUNTZ

Has Western Union Messengers Deliver Card No. 2

A profit of \$94.00 from one distribution of 1000 Check-Up Cards No. 2 was recently obtained by the Kuntz Electric Company of Millvale, Pa., who are enthusiastic about the results of their participation in the RCA "Check-Up" campaign. A novel feature of their campaign was the use of Western Union messenger boys for the card distribution instead of the usual mailing facilities.

To quote Mr. Kuntz: "We have tried your 'Tune-Up Card No. 2' and have found very pleasing results. We sent one thousand cards, at a cost of \$5.00 to us. In return for this small amount, we have realized a profit of \$94.00, which may later be increased through the sale of new sets to prospects derived from this campaign."

"We suggest that your cards be made to be distributed by Western Union men, instead of being sent by mail. This is not only cheaper, but it has more impression on the public."

The actual figures on the returns from Mr. Kuntz are as follows:

- (1) 1000 cards were mailed out.
- (2) 23 cards were returned.
- (3) 14 inquiries resulted in \$1.50 Tune-Ups.
- (4) 9 inquiries amounting to \$51 resulted in service work for an average of \$5.67.
- (5) One \$49.95 radio set was sold.
- (6) Four new prospects for radio sets are being followed up at the present time.

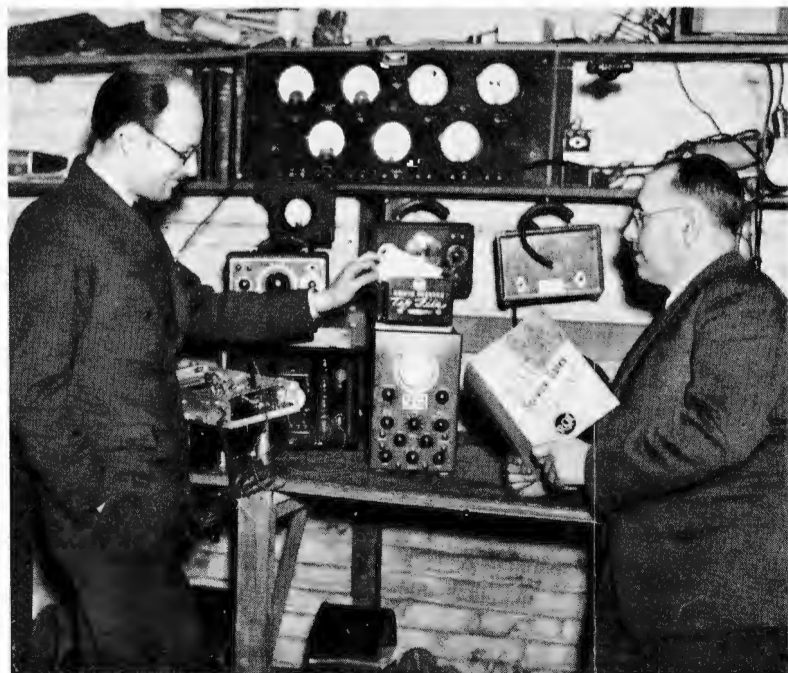
The results Mr. Kuntz obtained



Mr. Kuntz checking over the returned cards.

from this campaign are being repeated throughout the country. Backed by national advertising, local advertising and direct mail helps, the RCA Check-Up Campaign is proving a business-builder for hundreds of radio service dealers and engineers.

"Of Great Assistance"



H. L. Naylor, Manager of the Service Dept. of Krich-Radischo, Newark, N. J., and A. R. Abendschoen, prominent service engineer of South Orange, N. J., look over the RCA Radio Service Tip File. "Will be of great assistance to all service men," says Mr. Naylor. "Just what I needed to save much time and money," says Mr. Abendschoen.

Another New Model



Service engineers everywhere are interested in the announcement by the RCA International Division of the new Model T11-8. All reports indicate it will be an extremely popular table receiver which will feature the Magic Eye, Magic Brain and Metal Tubes.

NEW AMATEUR TRANSMITTER IS WELCOMED

Unit Construction Is Feature Of RCA Transmitter

A new amateur transmitter, designed and built by RCA, is now being offered to radio amateurs who desire the ultimate in low-powered transmitting equipment. This transmitter, which is known as the Model ACT-40, consists of three integral units, any one of which may be purchased and operated individually, or together they may be operated as a complete c-w and phone transmitter. The units are the Antenna Unit, the R-F Unit and the Modulator Unit.

According to E. C. Hughes, Jr., manager of the RCA Amateur Division, "The unit principle of construction used in this transmitter enables the amateur to purchase his equipment as desired, thereby adding to his equipment without losing all of his previous investments. Starting with a modest amount, the progressive amateur may build a station through the use of this unit plan that is on a par with moderate-powered commercial equipment," continued Hughes. "And in addition to RCA design, he is getting a greater amount of power on the air, per dollar investment, than in most transmitters having comparable refinements and operating advantages."

R-F Unit

The r-f unit includes all of the basic circuits of the transmitter from the crystal oscillator to the final amplifier. An RCA-47 which is excited by the crystal is coupled by means of plug-in coils to the buffer/doubler stage which consists of an RCA-802 Pentode. The buffer stage drives the final amplifier which consists of two RCA-801 Triodes connected in push-pull and operating as a class C amplifier. A combination of battery and grid leak bias is used on the r-f stages to keep the plate current at a safe value when excitation is removed. Provision is made for a plug-in crystal holder, such as the RCA TMV-135A.

Panel controls include tuning controls for the crystal oscillator, for the buffer/doubler stage and for the final amplifier. A selector switch connects the 0 to 200 milliammeter meter in either the crystal, buffer, P.A. grid or P.A. plate circuits. Additional switches are for filament voltage, buffer plate voltage and final amplifier plate voltage.

Modulator Unit

The modulator unit of the ACT-40 consists of a high-gain speech amplifier, a driver stage, a modulator stage and the necessary power supply circuits. The gain is sufficient to operate directly from a

crystal microphone or from a ribbon, magnetic or carbon microphone in conjunction with a coupling transformer. The amplifier consists of two RCA-57 resistance coupled stages which drive a pair of RCA-45 tubes connected in push-pull. The output of the RCA-45's drives the RCA-801 modulator tubes in the class B circuit. The



RCA ACT-40 Transmitter.

secondary winding of the class B output transformer is designed to work into a 4000-ohm load, such as is presented by the r-f unit. A panel gain control adjustment is provided together with a microphone input jack. Bias batteries are mounted on the modulator chassis and are held in place by a clamp.

Antenna Unit

The antenna unit of the ACT-40 transmitter is assembled on a standard rack mounting panel and includes the antenna tuning capacitors, the antenna ammeter, the antenna terminals and a switch for changing the antenna tuning capacitor connections. The design of this unit is such that it may be used with a resonant transmission line, a single wire non-resonant line or a current or voltage fed antenna. The operating side of the panel includes two etched dials for adjusting the tuning capacitors and is handsomely finished in a crackle lacquer.

Prices

ACT-40 C.W. Telegraph Only*	\$150.50
ACT-40 C.W. Telegraph and Phone*	235.00
ACT-40-A Antenna Unit	37.50
ACT-40-R R-F Unit with Integral Power Supply	110.00
ACT-40-M Modulator Unit with Integral Power Supply	84.50
ACT-40-C Cabinet Rack	20.75

Extra Coils:
 Crystal Oscillator Coil . . \$1.50
 Buffer/Doubler Coil 1.50
 Final Amplifier Coil 7.50
 All prices f.o.b. factory.

*Supplied with coils for one band only. Specify what band desired when placing order.

An illustrated folder describing this equipment will be sent upon request to those interested in Amateur Radio Equipment. Address RCA Amateur Radio Division, Dept. SN, Camden, N. J.

ENGINEER DESCRIBES DIRECT-READING UNIVERSAL BRIDGE

Ranges Easily Extended For Measuring Unusually Large Values Of Inductance, Capacity and Resistance

By M. J. Lovelady

Laboratory Methods and Equipment Section
RCA Manufacturing Company

The bridge network has long been used in precise laboratory investigation. However, there has



M. J. Lovelady

developed a great field of usefulness for a bridge to measure the value of inductance, resistance and capacitance found in the applied radio, sound and allied fields. While an A-C Bridge may be separated into various components for descriptive purposes, it is well to bear in mind that the problem of separating and confining their interrelations to the desired ones and eliminating others, largely constitutes the development problem. The reduction of fields from power supply, oscillator and transformers, by design and arrangement of parts, and the insuring of their uniform performance in production is only possible by comparison and analysis of several laboratory models.

Bridge Principle Explained

The bridge principle, introduced in 1833, by S. H. Christie, was first applied to resistance measurements by Sir Charles Wheatstone in 1843. In 1865, J. C. Maxwell applied the principle to inductance measurements, using a battery and a ballistic galvanometer. The telephone, invented in 1875 by Bell, supplied a very sensitive null indicator. At a frequency of about 1000 cycles the efficiency of both ear and telephone is high, and errors in the bridge operation due to capacity can be reduced to a small figure at frequency of this order.

A further advantage of the headphone over a meter is the ability of the ear to distinguish the fundamental from overtones. These overtones appearing in the bridge output, even though the input is a pure wave form, in the case of inductance with iron cores, since the inductance in that case is not a constant, but varies throughout the

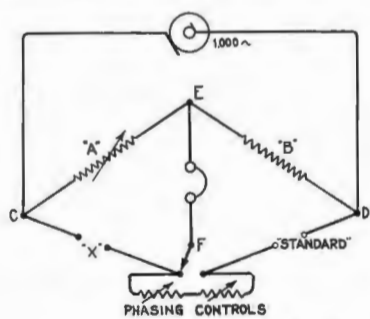


Figure 1—Simplified Bridge Schematic Circuit.

a-c cycle. The invention of the vacuum tube supplied a convenient source of signal and adequate sensitivity through its use as an oscillator source, and as a single or multiple stage amplifier.

Circuit Description

Figure 1 shows a simplified Wheatstone bridge circuit. In the RCA TMV-132A Universal Bridge, three standards each of inductance, resistance, and capacity are selectable by means of a ganged switch. For each range selected, ratios of X to Standard of .1 to 1, and 1 to 10 are available by the Low-High switch. In the Low position (the .1 to 1 ratio), arm B is equal to the overall resistance of arm A. For the High position (the 1 to 10 ratio), arm B is one-tenth the overall resistance of arm A. By this arrangement, the linearity of the ratio scale is preserved for ratios both below and above the standard. This also enables the fixed standard to be used for comparison over an overall range of one-hundred to one. At the same time, a ratio between the

arms A and B, not greater than ten to one, is maintained which is an advantage in spreading the scale, and in preserving sensitivity since the greater the ratio, the less the sensitivity. Since capacitive reactance is an inverse function of capacitor size, for capacity measurements, the X and Standard arms are reversed from the positions shown in Figure 1. This switching is taken care of automatically when any of the capacity standards are switched in.

Arms Reversed

In Figure 2 the schematic diagram of the RCA TMV-132A is shown. The first two sections of the ganged switch S-1, select any one of the nine standards. The two rear sections serving to reverse the A and B arms for capacity measurements as described above. R-6 corresponds to arm A in Figure 1.

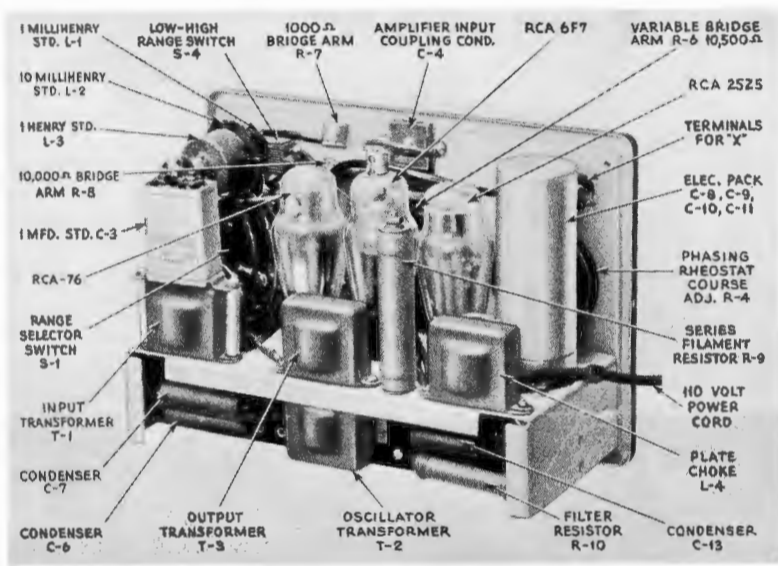


Figure 3—Rear view of RCA Universal Bridge.

R-7 and R-8 correspond to arm B in the High and Low positions respectively. R-4 is the coarse and R-5 the fine phasing control. C-17 is a variable air condenser to phase out the wiring capacity for resistance measurements from .1 to 1 megohm. T-1 is the input transformer, balanced capacitively to ground, and is connected to the output winding of the three winding oscillator transformer T-2. For sensitivity the bridge output indicated symbolically in Figure 1 by headphones is connected to the grid and cathode of the pentode section of the amplifier tube RCA 6F7. The plate of this section of the tube is tuned to 1000 cycles for harmonic suppression, and high gain, by L-4 and C-13. The second stage of amplification is provided by the triode section of the same tube, its grid being fed through C-12. The output of the second stage is coupled to the headphones by transformer T-3.

The plate voltage for the oscillator and amplifier tubes is obtained from an RCA 25Z5 rectifier in a voltage doubling circuit. R-10 and

the unit with case removed and Figure 4, a front view of the complete assembly.

Specifications

- Range of Measurement: Inductance—100 microhenries to 10 henries. Capacity—10 micro-microfarads to 10 microfarads. Resistance—1 ohm to 1 megohm. Accuracy—5% overall at full scale. Weight—6 pounds. Height—6 1/2 inches, Width—9 3/4 inches, Depth—4 1/2 inches.

Indirect Measurements

In addition to the regular ranges of the instrument, other measurements, although not read directly, can be obtained by means of the Bridge. A chart for series capacities and parallel resistance, useful in this connection, is shown in Figure 5.

The mutual inductance of two coils may be obtained in either of the following ways:

(A) Connect the coils in series and obtain the inductance. Then

Measures Wide Values of LCR

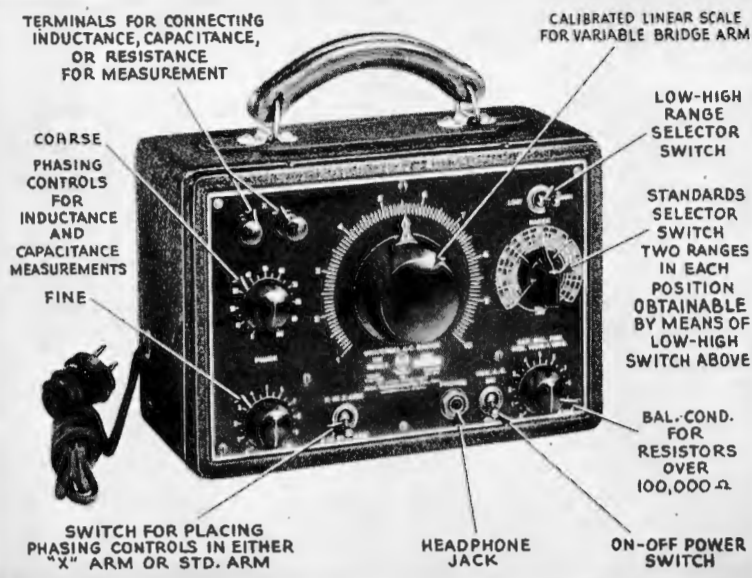


Figure 4—Front view showing controls of RCA Universal Bridge.

C-10 comprise a resistance capacity filter. This method of providing the plate supply eliminates magnetic fields that would come from transformers and choke, and permits the close arrangement of parts. The filaments of the three tubes are in series with dropping resistor R-9, and connected directly to the a-c line.

Figure 3 shows a rear view of

reverse the leads on one of the coils, and again measure the inductance. By subtraction, obtain the difference between these two values. One-fourth of the difference is the value of the mutual inductance.

(B) Measure the value of each of the two coils separately, and add the two values together. Then connect the coils in series and measure the inductance. This latter measurement will be greater or less than the sum of the individual inductances of the coils, depending on whether they are aiding or bucking. In either case, however, this difference will be twice the value of the mutual inductance.

Higher Value Chart

This chart may be used to obtain the values of both resistances in parallel and capacities in series, since the formula in both cases is the same, being merely the product of the two divided by the sum.

First, consider the oblique scales A and C and the vertical scale B. If a straight edge is laid on the chart so as to intersect these three scales, then scale B will represent the combined values of Scales A and C. The values involved must be kept in the same units, but may be ohms, microfarads, or may be any fraction or multiple of these units, as one-tenth, one-hundred times, etc.

Use Straight Edge

Scale D is to be used with scales A and C also. Let the units represented by scale C be one-tenth those represented by scale A. If a straight edge is laid on the chart the combined result of the intersected values on scales A and C can be read on scale D. An illustration will make this clear. Let 4 on scale A be 4 megohms, and 10 on scale C be one megohm. Then the straight edge connecting these two points

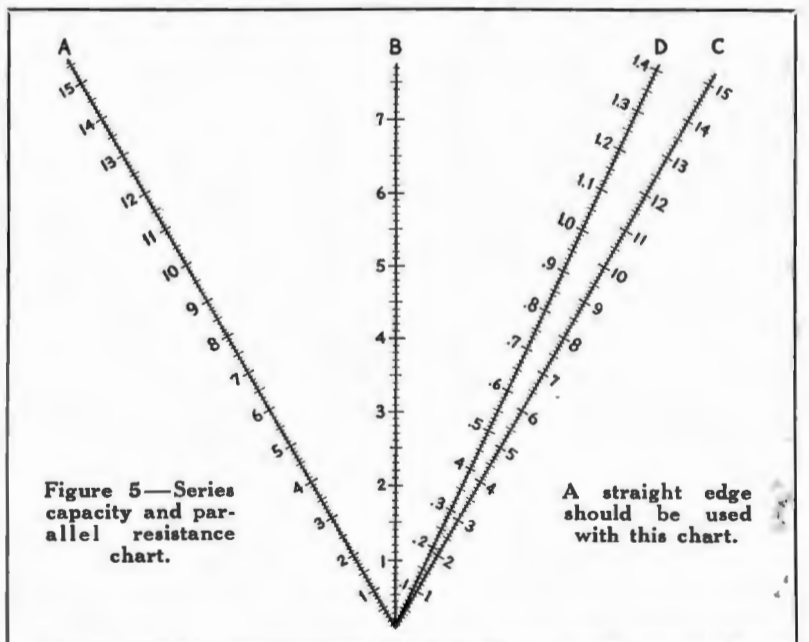


Figure 5—Series capacity and parallel resistance chart.

A straight edge should be used with this chart.

will cross the D scale a .8 megohm, or 800,000 ohms.

The chart may be used for inductances in parallel in the same way as for resistances in parallel, it being understood of course that the inductances are separated physically so that there is no mutual coupling.

Construction of Chart

Let the A and C scales form any convenient angle. Let scale B bisect this angle. Draw a line from

REGISTRATION CARD INSURES EXTRA HELPS

Service Tip File Owners Placed On Preferred Mailing List

According to Mr. F. A. P. Zeisner of Raymond Rosen Co., Phila., Pa., one of the best things about the RCA Three Point Service System is the special service that all owners of the System receive from RCA. The Service Tip File Registration Card is included with all Service Tip Files and when filled out and returned to RCA by the Tip File owner, places his name on a preferred list for many technical papers. Advance copies of RCA Radio Service News, announcements of special interest to owners of the Three Point Service System and other information are sent out to this preferred list of radio service engineers. Such advance information, together with the great help afforded by the RCA Three Point System, definitely marks the owner as a radio service engineer of enterprise and ability.

REGISTRATION CARD

Ownership of the RCA Three-Point Service System identifies you as a progressive radio service engineer to whom RCA wishes to extend its fullest cooperation.

Additional Tip Cards can be obtained from your RCA Parts Distributor in packets of 20 cards. However, to be sure of receiving special announcements pertaining to your RCA Radio Service Tip File, be sure to fill in and return the attached card. Names so registered will be placed on a PREFERRED MAILING LIST to receive any special mailings, including RCA Radio Service News, and other material of interest to service engineers.

Owner's Name _____ (Give name of individual or firm to be registered in view of the RCA Service Tip File)

Street Address _____

City _____ State _____

Phone Number _____

Address _____ (Give name of your firm if different from owner's name)

I am _____

An independent service engineer. I do not sell.

Service engineer for an dealer. An experimenter.

A licensed master. Other _____

Do you sell and install P. A. equipment? Yes _____ No _____

Print Name _____

This registration card is packed with all Service Tip Files

In addition to the special information that owners of the RCA Service Tip File receive through the Registration Card, the Service Tip Packets, which are also available at all RCA Parts distributors, keep this File growing indefinitely. These packets contain 20 new, carefully selected Service Tips and are obtained free by purchasing RCA Parts to the amount of \$10.00 per packet. While earning the first six packets, the owner of the Service Tip File is also working towards the refund of \$1.50 which is returned when his purchases amount to \$60.00.

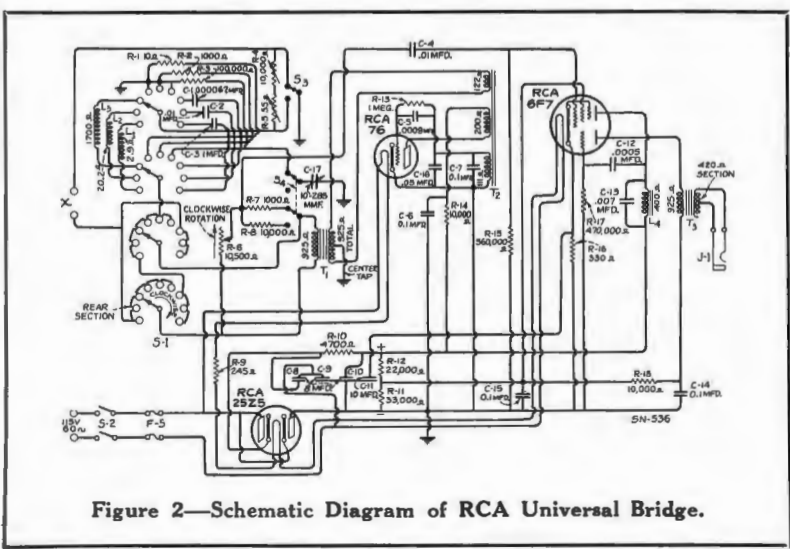


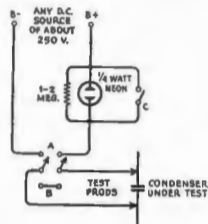
Figure 2—Schematic Diagram of RCA Universal Bridge.

SERVICE TIPS

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

Condenser Tester

The diagram shows my idea of a condenser tester which I believe is superior to any that I have so far seen. For testing condensers normally leave switch C open, and throw double-pull-double-throw switch from B to A. If condenser tests OK, repeat this test several times. When switch is thrown from A to B condenser is automatically



discharged. If condenser still is testing OK, keep switch at A and subject condenser to a much higher voltage by closing switch C. Now open C and throw D.P.D.T. switch from A to B, thus automatically discharging condenser and immediately back to A for leakage test. This will invariably show up the fault.

Jerry Albanese,
65 Whittlesey Ave.,
West Orange, N. J.

RCA Victor Model M-34

Vibrator noise in RCA Victor Model M-34 Auto Radio Receiver may be caused by the breaking away of the soldered bond between the chassis and the partition separating the power transformer from the rest of the set. Resoldering this partition will permanently remedy this condition.

R. Olander,
A-1 Radio Company,
1379 East Colorado Blvd.,
Glendale, Calif.

Tone Quality Improvement

A simple conversion can be made on receivers that use 171-A push-pull tubes, to use the Type 45 push-pull tubes. This is done by removing chassis, and wiring the two power tube sockets in series. This will give each 45 tube 2.5 volts on their filaments. The bias in all cases is adequate for good tone. A noticeable improvement in the quality is obtained, with a slight increase in volume. The slight increase in filament current on these older type receivers is easily carried by the power transformer.

I. F. Gardner,
Abbott Elec. Co.,
213 West 7th St.,
Hanford, Calif.

RCA Victor Model R-11

When one finds this particular set inoperative until the automatic volume control tube is withdrawn, the cause is usually a leaky .1 mfd. grid return resistor on the automatic volume control lead. Also very weak distorted reception is caused by an open circuit winding in the second intermediate transformer.

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

General Electric Model K-64

Intermittent reception in several General Electric Model K-64's proved very hard to find. After replacing almost every condenser in the circuit, the .05 mfd. between short wave antenna coil and ground (C3 in service notes) was replaced with a new one. This proved to be the faulty one, and fixed the trouble. Since finding the first one, I have successfully repaired two other K-64's by this same replacement of C3.

L. M. Parker,
320 E. Seneca St.,
Sherrill, N. Y.

Loud Hum in Philco Receiver

A complaint of extremely loud hum in the 1936 Philco's that occurs only when the stations are tuned in was found to be caused by a defective lightning arrester. A heavy leak occurred from the center terminal to the antenna terminal, which caused the hum. By replacing it with a new lightning arrester, the trouble was cleared up.

George R. Zivny,
928 E. 144th St.,
Cleveland, Ohio.

Checking Oscillator Operation

Frequently the service engineer wishes he could "see" if the oscillator tube is working in a super. This is impossible, but you can easily hear exactly what it is doing by the following simple test. Turn on a set that is OK. Now turn on the "sick" radio. Take one end of a piece of hook-up wire and make a half turn around the oscillator tube in the "sick" radio, and lay the other end of the wire close to the 1st det. in the "good" radio. Now tune both sets to the same station, dialing the "sick" radio very carefully back and forth across the place on the dial where the station should be received. If the oscillator is working in the doubtful set, you will hear a whistle or beat note. If the note you hear is steady and true, the oscillator tube is operating properly, but if the note is wavering and running up and down the scale, then the oscillator circuit will need checking.

Douglas C. McCall,
69 E. Pine St.,
Orlando, Fla.

Majestic Model 300

This model has dual speakers which had been repaired previously. The set lacked the proper pep and had poor volume, although everything tested all right. Upon examining speakers it was found that they were improperly phased. By reversing the voice coil leads of one speaker, proper phasing was obtained and the tone quality and volume restored.

George F. Baptiste,
P. O. Box 114,
Harvard, R. I.

Improved Sensitivity

The sensitivity of midget receivers may be increased by a very simple change. I have tried this out on a number of different manufactures, and in every case it works.

Most of the midget receivers on the market employ grid bias rectification, with a screen grid tube. To pep up these compact midgets, connect a 1/4 meg. resistor across a .00025 mfd. capacitor and place this combination in series with the grid lead of the detector tube. Detector amplification will be greatly increased, and the set will have better sensitivity because of its higher gain. The Gulbransen midget uses approximately the same connection.

Voto F. Daidone,
212 Fairmount Ave.,
Newark, N. J.

Victor Model RE-57

The complaint in this particular case was extremely strong amateur phone interference. The interference came in on all stations at ordinary volume level, and could only be eliminated by turning up the volume control. The amateur transmitter was in the same apartment house as the set. I tried the conventional wave-trap combination without effect. Also removing the aerial did not stop the trouble. However, disconnecting the ground from the radiator, and connecting it to a cold water pipe with a national RF choke in series with the set and ground, overcame this trouble in a satisfactory manner.

Fred K. Clark,
260 Bower St.,
Jersey City, N. J.

Studebaker Ignition Interference

While clearing up ignition interference in a 1936 Studebaker I found that the exhaust pipe had to be grounded with a piece of shielding to the frame of the car. This was due to its radiation near the plate antenna which was in use. The ground had to be connected to the car frame, near the lead-in of the antenna.

W. R. Minlar,
500 W. Pierce St.,
Kirksville, Mo.

Stewart Warner Compact

A speaker cone dragging on this model presents an unusually difficult problem because there is no arrangement made for centering. However, by dampening one side of the cone where the speaker drags, and letting it stand and dry until a wrinkle appears, it will pull the cone back in place. Carefully shellac the wrinkle, and the cone will stay in this position. I have worked this a number of times with only one failure that required a new cone.

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

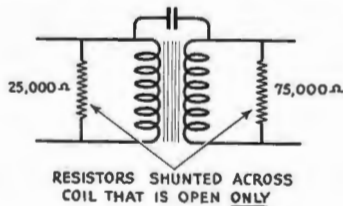
Locating Ignition Noise

By connecting an RF choke coil across a set of headphones and using same as an exploring coil, it is a simple matter to locate ignition noises, etc., while cleaning up a car radio. By holding the coil close to the various wires under the dash, the ones causing the trouble can soon be located, and the annoyance eliminated by the use of a filter capacitor.

R. I. Anderson,
Box 181,
Culver City, Calif.

Transformer Substitute

An emergency repair for an audio transformer may be made by using the impedance resistance coupling method instead of the transformer. The only disadvantage is a slight loss of gain. The illustration shows the proper method



of making this connection, which is to shunt an open primary with a 25,000 ohm fixed resistor, an open secondary with a 75,000 ohm fixed resistor. In both instances a .08 or larger fixed capacitor is shunted from the plate to the grid terminals of the transformer.

Robert Schenck,
148 E. Main St.,
Cardington, Ohio.

Bridge Null Indicator

I would like to call attention to the fact that the RCA Oscillograph TMV-122B is probably the best null indicator for use in conjunction with the TMV-132A Universal A-C Bridge which it would be possible to find.

The vertical plates, or "Y" axis, should be connected directly to the output of the bridge, and the horizontal plates, or "X" axis, should be used as the timing axis. Any timing reference is suitable, as synchronism is definitely not desired. Without synchronism, the signal will be represented by a broad band on the cathode ray tube narrowing of this band indicating the approach of the null point. With the use of the self-contained amplifier in the oscillograph, an extremely sharp null point can be reached, regardless of whether the bridge is being used for the measurement of resistance, inductance or capacity.

D. Mathewson,
Dixie Radio Distributors,
Atlanta, Ga.

Likes Plan



Mr. W. H. Warmington, of Minneapolis, Minn., President of the National Radio Service Association, when shown the RCA Three-Point Plan said, "RCA offers a practical assistance which every service man needs and appreciates."

TELLS HOW TO OBTAIN THREE-POINT SYSTEM

Sales Executive Explains Simple Details For Ownership

According to G. P. Allen, Sales Manager of the RCA Parts Division, ownership of the RCA Three Point Service System is within easy reach of every service engineer, regardless of the size of his business. "As a matter of fact," said Allen, "the very act of obtaining the Three Point Service System is a long step in accomplishing its results as it insures that the service engineer is using quality RCA Parts. Quality parts plus quality work give the radio owner a better job and give the service engineer more profits with fewer headaches."

Simple Requirements

The RCA Three Point Service System, which is now being shown by all RCA Parts distributors, is obtainable on a simple deal, which enables the service engineer to obtain it for only \$1.50—a sensational value. The details are as follows:

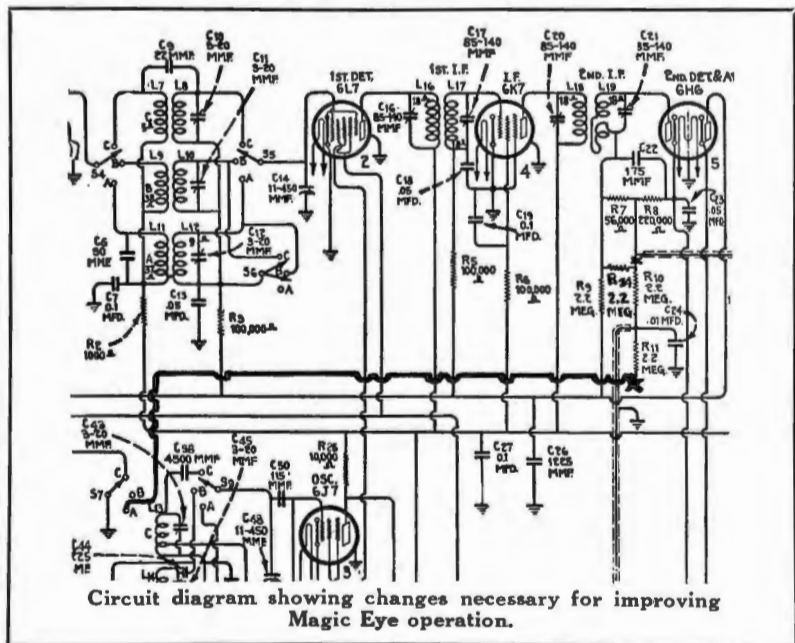
1. The service engineer should go to his RCA Parts distributor and obtain the RCA Three Point Service System Purchase Record Card.
2. When purchases of RCA Parts (RCA Test Instruments and Tubes not included) total \$5.00, as shown on the Record Card, the service engineer may obtain the entire Three Point System for \$1.50 plus a deposit of \$1.50—total initial outlay \$3.00.
3. After the first \$5.00 of purchases of RCA Parts, the service engineer is entitled to a packet containing 20 Service Tip Cards for the Service Tip File—in addition to the initial 200 cards—for every \$10.00 of purchases. Each packet is numbered to avoid duplication of tips.
4. When total purchases are \$60.00, as shown on the Purchase Record Card, the \$1.50 deposit will be returned by the RCA Parts distributor. Thus the entire System, including 320 Tips, costs only \$1.50.
5. Packets of 20 new Service Tips will be continually available for each \$10.00 of purchases.

SHOWS WAY TO BETTER MAGIC EYE FUNCTION

Circuit Change Improves Tuning Action On Short-Wave Bands

By Robert A. Haines
Tri State Electric Co.

For owners of RCA Victor Model C11-1 who like an extremely positive indication of the Magic Eye on all wave bands the following suggestion is a great help. A simple change in the circuit makes it possible to greatly accentuate the action of the Magic Eye on



Circuit diagram showing changes necessary for improving Magic Eye operation.

the short wave bands without any detrimental effects whatsoever.

Special changes in the wiring of the RCA 6E5 tuning tube are shown on the revised circuit diagram.

The junction of R10, 2.2 megohm resistor with the R8-R7 connecting lug on the second i.f. transformer is opened. R10 is connected in series with a similar size resistor herein designated as R24 and connected to the C21 connecting lug on the second i.f. transformer. An unused contact is removed from its normal location and relocated in a blank punching hole of the same section so as to secure contact when the moving arm of S7-S8 is in the "A" band position only. In this position of the range switch, the relocated contact is grounded. R11, also 2.2 megohms, is removed from ground and reconnected by means of a short lead to this contact.

Increases Action

The effect of the revision is the greatly increased action of the RCA-6E5 tube on bands "B" and "C" over that secured on band "A."

On band "B" and "C" the grid of the 6E5 tube is "seriesed" with 4.4 megohms of resistance and shunted across the full diode load resistance network (R7-R8). On band "A" only, 6.6 megohms of resistance is connected from the diode end of R7 to ground with the grid of the 6E5 connected to a point 2.2 megohms above ground and receiving one-third of the total voltage developed across the full network.

In making tests on the revised instrument it was observed that the second harmonic (2220 kc) of the local 2500 watt broadcast station secured slightly more action from the tube than did the fundamental of this same station carrier tuned in at 1110 kilocycles on the "A" band. It was roughly determined that any station on the "C" band that could be received with any audible satisfaction caused definite perceptible deflection of the shadow of the 6E5 tube which condition had decidedly not existed before the revision of the circuit as described above.

These same changes are also applicable to the Model C9-4.

RADIO SERVICE ASSOCIATIONS ENDORSE THREE-POINT PLAN

Efforts of RCA to Improve Status of Service Engineers Meets Approval Over Entire Country

A nation-wide acclaim, from the smallest individual service engineer to the fully equipped engineering laboratory, greeted an advance showing of the RCA Three-Point Service System. While for years, RCA has made every effort to help the service engineer with his technical problems, the announcement of the new Three-Point Service System for promoting both the technical and the business side of the service profession has been the first nation-wide effort to improve the business side of the radio service profession.



E. M. Oldach

Philadelphia Reports

In Philadelphia, E. M. Oldach, President of the Philadelphia Radio Service Men's Association, said, "The RCA Three-Point Service System should be in the hands of every radio service engineer. I consider it a vital aid to a better service business."

And Mr. F. A. P. Zeisler, Service Manager for Raymond Rosen & Co., says, "The service engineer has too long been neglected. To me, it seems equally important for a service engineer to refer to such a file as you have compiled, as it is for a lawyer to refer to the history of past cases. . . . The booklet, "101 Ideas," carries a wealth of suggestions which will profit any one who takes the trouble to follow them out."

And from Mr. Paul A. Keller, a prominent service engineer in Philadelphia, "I can readily see how the Service Tip File will save lots of time because the dope is quickly available when you need it."

From Peoria

From Peoria, Ill., Mr. Arthur A. Walter, Manager of Supreme Radio, 335 S. Adams St., reports: "The RCA Manufacturing Co., Inc., Parts Division has taken another great step toward helping the independent radio service man in the profitable conduct of his business. Successful servicing requires the independent service man to know how to do his work efficiently while conserving his time, how to sell his services and, most important, how to determine his cost of doing business."

"Knowledge of the first requirement prompted the service man to

go into his own business but it takes an ever increasing knowledge of the other two requirements to keep him in business.

"The 'Three-Point Service Plan' by which the service man may obtain the RCA Service Tip File, the booklet, '101 Selling Ideas for Service' and the book, 'Radio Service Business Methods,' offers every independent service man the opportunity to economically obtain additional education in the 'Three R's' of successful servicing."

California Enthuses

From California, Ed Jones, popular roving diplomat and emissary of good will for Leo J. Meyberg Co., San Francisco, says: "Every service shop should have one of the service files on the bench, just another one of those magic brains, and the books, '101 Sales Service Ideas' and 'Business Methods' handy at all times. The service engineer will find the answer to many a perplexing problem in one or the other of these fine books."

And from another San Francisco radio dealer, Mr. Geo. W. Kuersten: "The book written by Mr. Rider is a prize in itself and should be in the hands of all service men, whether working on a salary or for himself. The cross index of the Service Tip File shows that you include all the better known sets as well as most of the lesser known sets. Your idea of providing for additional cards and for notes of one's own making are not to be overlooked, and makes the system one easily kept up to date at all times. We have used such a system for several years and feel that we could not do without it."

Mr. Clayton F. Bane, Sales Manager of the San Francisco Radio Exchange, concludes his comments with: "It is seldom that a good sales plan is available at such a low cost. With this plan costing literally nothing and with the obvious advantages it has, I cannot see where it can help from being a certain winner. Short sighted indeed would be the service man, who, being offered a means of stimulating his business, will turn it down."

The article by Chester M. Sinnott on the Dynamic Amplifier, which appeared in our last issue, has aroused considerable interest. This article was reprinted in RCA Radio Service News by special permission of Electronics magazine which is edited by Keith Henney.

Won By 8,500 Engineers



The above attendance certificate has been won by over 8,500 radio service engineers who attended the Fall 1935 RCA Service Meetings. Attendance at all three meetings was a requirement for the award of this certificate.

Dreamer Of Songs



From New Orleans comes beautiful Dorothy Lamour, alluring "Dreamer of Songs" who is heard over an NBC-WJZ network. Hollywood, as can be well understood, is eager to change Dorothy's place of residence.

ANNOUNCE RCA SERVICE MEETS IN SO. AMERICA

Mexico and Central America Also Included In Recently Arranged Schedule

Announcement by J. M. Regottaz, Manager of Instrument Sales, RCA International Division, of a series of service meetings in Central and South America now brings the benefits of these remarkable meetings to additional hundreds of service engineers. Mr. G. Warren Kimball of the RCA Service Division will deliver the lectures on the South American schedule.



G. W. Kimball

Aroused Interest

The remarkable enthusiasm and interest among service engineers aroused by the RCA meetings held throughout the country has extended beyond the borders of the United States. RCA distributors in South and Central America have heard so much about these meetings that they have requested the RCA Manufacturing Company to conduct similar meetings in their countries.

Mr. Kimball's experience in this work dates back to the first meetings held over two years ago, and the Latin American service engineers who attend sessions under his supervision will be assured of interesting lectures.

Covers All Important Points

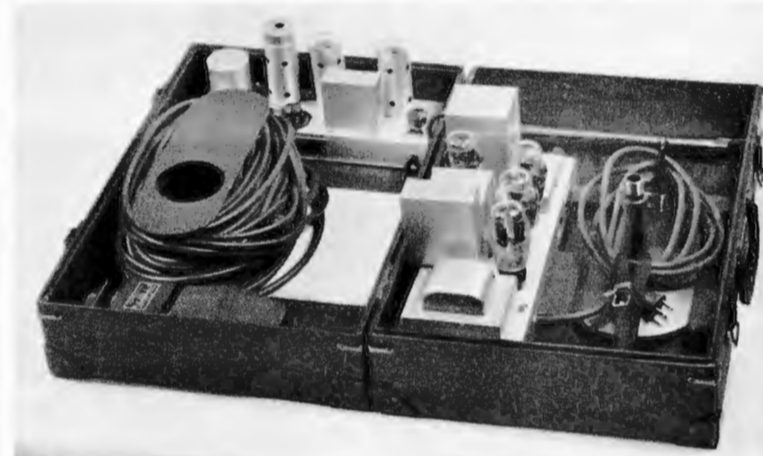
A complete itinerary covering nearly all the important Central and South American countries and Cuba has been arranged, and Mr. Kimball already has delivered several lectures in Mexico and Cuba. The itinerary will extend well into the latter part of April, 1936, and contemplates visits to the following countries:

- Mexico City, Mexico.
- Havana, Cuba.
- Port-au-Prince, Haiti.
- Sto. Domingo, Dom. Rep.
- San Juan, Porto Rico.
- Fort-de-France, Martinique, F.W.I.
- Port-of-Spain, Trinidad.
- Caracas, Venezuela.
- Barranquilla, Colombia.
- Medellin, Colombia.
- Bucaramanga, Colombia.
- Bogota, Colombia.
- Manizales, Colombia.
- Cali, Colombia.
- Guayaquil, Ecuador.
- Quito, Ecuador.
- Lima, Peru.
- Arequipa.
- La Paz, Bolivia.
- Panama City, Panama.
- San Jose, Costa Rica.

Tegucigalpa.
San Salvador.
Guatemala City.
Kingston, Jamaica.
For the exact dates of these Service Meetings, Service Engineers should consult their jobbers.

HAM NOTE

RCA Parts Distributors are still cooperating with Amateur Radio Organizations to arrange meetings for the RCA Service lecture, "X-Raying Amateur Rigs with the RCA Cathode Ray Oscillograph." This lecture gives the real low-down on getting ham rigs to operate like fifty kilowatts.



Amplifier and Microphone Unit of RCA PG-62 P. A. Equipment

NEW ALIGNMENT TOOLS HELP ON ALL WAVE SETS

Fibre Screwdriver and Flexible Wand Announced

The announcement by the RCA Parts Division of two new alignment tools will be welcomed by service engineers concerned with aligning all-wave receivers. The new fibre screwdriver permits circuit ad-

justment on the extremely high frequency bands without circuit disturbance. This is not possible with screwdrivers having a metal bit.

The flexible tuning wand permits use of this necessary tool in sets in which the entrance holes for the tuning wands are not in mechanical alignment. This is particularly true of the 1936 RCA Victor receivers now in production.

RCA Parts distributors are now featuring these tools.

RCA Parts distributors are now featuring these tools. Net Price
Stock No. 11890 Fibre Screwdriver \$0.38
Stock No. 6679 Tuning Wand. 1.10

TRENTON HOTEL USES RCA PG-62 SOUND SYSTEM

Broadcast Stars Prefer Studio Type Equipment

Another outstanding example of solving difficult problems by RCA equipment was recently reported by the management of the famous Stacy-Trent Hotel in Trenton, N. J. Recently, the cocktail room was renovated and made one of the finest in that section of the country. While every architectural help was used for this purpose, the hotel management overlooked the necessity of installing a P.A. system during the remodeling.

However, when presenting featured artists from the broadcasting companies, difficulties were encountered because practically all artists are trained for microphone use. The PG-62 which has 20 watts output and uses the same velocity microphone used in all better broadcasting stations, solved the problem to the satisfaction of all concerned. One speaker was located in the cocktail room while the other was placed in the main dining room.

Has Two Units

The RCA Portable Public Address Equipment is one of the most popular portable type equipments available for sound re-enforcing and public address work. It is complete in two suitcase type units, one containing two speakers and the other containing the amplifier and microphone equipment. An overall gain of 108 db. with 20 watts output is sufficient for gatherings up to 2500 or more people either indoors or out. Use of the RCA Velocity Microphone insures the finest quality of

reproduction with the advantages of directional pickup offered by this type of microphone. The use of two electrodynamic type speakers having large power-handling capabilities further improves the flexibility of this equipment as often it is necessary to have more than one sound source to obtain proper coverage.

Inquiries concerning this equipment should be addressed to the nearest RCA Parts or Commercial Sound Distributor or direct to RCA Commercial Sound Division, Camden, N. J., and ask for Form 9706.

Solves Problem



Russel Davis, Secretary of the Radio Technicians' Association of San Francisco, Calif., believes the RCA Service Tip File solves the problem of compiling service information. "Your method of distributing this Three-Point Service System to the radio service fraternity, I am sure, will meet with their hearty approval," continued Mr. Davis.

RCA CRYSTAL CALIBRATOR IS ACCURATE TEST INSTRUMENT

Engineer Describes Design and Manufacture Of Primary Frequency Standard Of Unique Performance

By O. M. OWSLEY

Laboratory Methods and Equipment Section
RCA Manufacturing Company

The RCA Piezo-Electric Calibrator was developed primarily to fill the need for a portable frequency standard of high accuracy to be used for the calibration of radio receivers, oscillators, signal generators and miscellaneous laboratory and service instruments.

The unit consists essentially of a piezo-electric crystal accurately ground for two modes of oscillation (100 kc and 1000 kc), an associated oscillating circuit for each mode of oscillation, a switching device so that either mode of oscillation may be selected and a power transformer for supplying heater current to the 955 acorn tube. The RCA-955 tube was chosen because of space limitations. The complete instrument only weighs 1 pound and 3 ounces, and is housed in a case $5\frac{1}{2} \times 3\frac{3}{8} \times 2\frac{3}{8}$ inches. The front and rear views of the complete instrument, showing the location of the various component parts described



O. M. Owsley

A reference to the schematic diagram, Figure 3, will show the proper connections for supplying the oscillator plate with an external d-c voltage. It will also be noted that 110 V. a.c. is still required for supplying heater voltage.

A further reference to Figure 3 will show the complete schematic of the circuit and the method of switching modes of oscillation employed in this instrument. The circuits employed are highly inductive and very rich in harmonic content, making possible the use of 100 kc steps from 100 kc to 20,000 kc and 1000 kc steps from 1000 kc to 50,000 kc. As previously stated the crystal employed is an X-cut crystal having two modes of oscillation; 100 kc as a contour oscillator and 1000 kc as a thickness oscillator. The holder used is a specially designed air gap type with provisions made to lock the top plate when final adjustment is made. By cooperation with the crystal laboratory it was found possible to grind crystals such that the 100 kc mode of oscillation could always be adjusted to absolute zero with the primary standard by the air gap adjustment and still have the 1000 kc mode well within the guaranteed tolerance of .05 per cent.

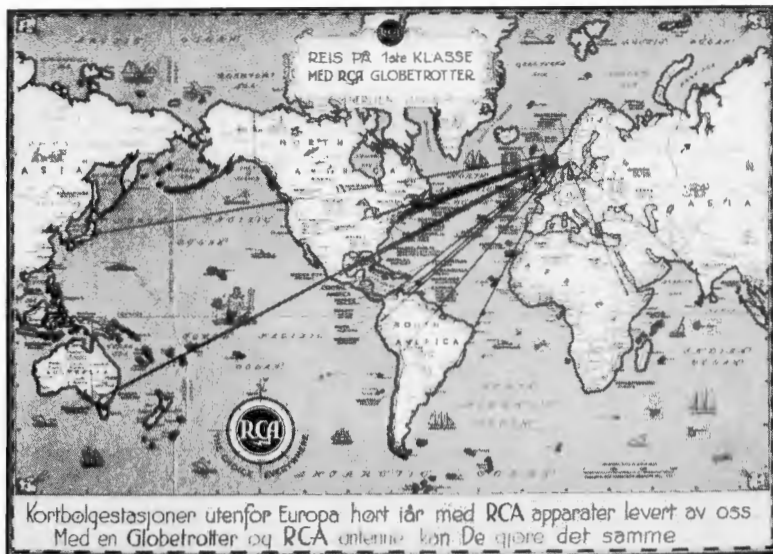
Tank Circuit Fixed Tuned

In view of this fact the 100 kc tank circuit is made fixed tuned, this method of adjusting the 100 kc crystal has several advantages. One of these is that there is no variable or adjustable tank capacitor to turn and thereby ruin an accurate calibration. Another advantage is that in a large number of cases the 1000 kc steps are merely used for location so that their accuracy need not be as great as the 100 kc steps. An example of this might be a calibration point at 5.6 megacycles. This, of course, would be located by using the 1000 kc steps first and locating the 6.0 megacycle point, then using the 100 kc steps, count back to 5.6. This method of adjustment also offers a decided advantage to the customer. If after a long period of use a crystal has to be removed for cleaning, it will not be necessary to return instrument to factory for calibration. A calibration can be made by adjusting the air gap for zero beat on one of the 100 kc steps with a broadcasting station such as WLW (700 kc) giving an accuracy of plus or minus .007 per cent approximately. This will make very little change in the 1000 kc accuracy provided the 100 kc tank capacitor setting has not been changed.

Overcoming Grid Loading

Another novel feature of the circuit is the method of overcoming grid loading on a-c operation. Considerable difficulty was encountered in development in getting a normal circuit to work with crystal control and give the desired results, i.e., high harmonic output and stable operation. This is due to the time lag of the crystal, the short dura-

RCA North Of The Arctic Circle



The above card is distributed by the RCA Victor distributor, J. L. Nerlien, located in Oslo, Norway. An interesting installation of the RCA World-Wide Antenna and an RCA Victor Model 143 is that recently made in Hammerfest, Norway, 285 miles north of the Arctic circle.

BETTER YEAR DURING 1936, SAYS ALLEN

Adequate Stocks Of Parts Insure Prompt Deliveries

That the enthusiastic use of RCA Parts and Test Equipment by service engineers everywhere has taxed the production facilities of the great RCA plant at Camden during the past few months is amply proven by the large increases in business by RCA Parts distributors. "In spite of the fact that failures of parts in the products manufactured at Camden are lower than they have been at any time in the past," said George P. Allen of the RCA Parts Division, "we have been busier this Fall than ever before. This increase in business, we believe, is an expression of gratitude on the part of dealers and service men throughout the United States for the help they have obtained through RCA Service Schools and other RCA Service helps.

"An increase in the number of distributors selling RCA Parts and

Test Equipment since January 1, 1935," he continued, "combined with the ease with which this equipment may be purchased with the help of the illustrated parts catalog make it unnecessary for a service engineer to use substitute parts in making repairs to RCA Victor receivers.

Many Orders

"For a time, this expression of appreciation on the part of service engineers proved embarrassing to us. Stocks of merchandise which experience indicated would be adequate for many months left Camden within a few weeks due to the unprecedented support we are receiving. In some instances we were compelled to ask our customers to wait until increased production facilities could catch up with orders.

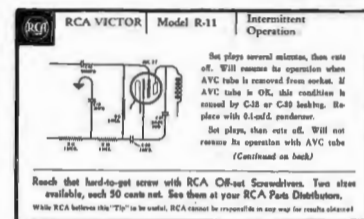
"Adequate stocks are on hand now as a result of the cooperation of everyone who has had anything to do with giving the service we believe our friends have a right to expect of us. The quick sale of the Piezo-Electric Calibrator and the Universal Bridge announced recently show that service engineers have been making money and are looking ahead to improve the work they do for their customers. With these indications that the owners of radio sets do appreciate the improved entertainment which can be secured from the work of a competent service engineer who uses good test equipment and factory tested parts, 1936 looks like a prosperous year.

SERVICE TIP FILE COVERS 37 SET MAKES

Diagrams And Shop Kinks Also Included

Although members of the radio service fraternity cannot seem to agree as to which of the units of the new RCA Three-Point Service System is the most useful, it is universally agreed that the Service Tip File will be referred to most frequently.

Every word written by practicing radio service engineers, the RCA Radio Service Tip File gives every radio service engineer the benefit of the experience of hundreds of other engineers and does it in a convenient manner. The experiences described are not just on routine matters, but are on the difficult problems that are not easy to solve by the best of engineers. Supplementing the information on actual set faults are many hints on building of special apparatus, peak



Typical Service Tip Card.

voltmeters, tube voltmeters, output indicators and many others.

Each service tip is on a 3 x 5-inch card. All are fully indexed both as to set manufacturer and as to trouble. The ability to find a tip when you want it is just as important as having it. Only in a card file, scientifically indexed, can such flexibility be obtained both for present and future tips. The standard card size—3 x 5-inch—permits owners of the file to make and file their own cards as new "wrinkles" are discovered.

Supplements Issued

The first two hundred Radio Service Tips will be supplemented by Service Tip Packets, each containing 20 new cards. Tabbed index cards are supplied when required. These Service Tip Packets are available only to owners of the RCA Three-Point Service Plan.

The steel filing case housing the RCA Service Tips is designed and built to give a lifetime of service. It will hold a total of 1200 cards, thus allowing for expansion over a long period of time. Electrically welded corners, a follower-block that works, and a positive drawer stop make this filing cabinet ideal for heavy duty service. It is finished in a handsome deep green, with gold and red lettering, and will prove a worthy addition to all service engineers' equipment. All RCA Parts distributors are now showing this remarkable service aid.

Two of a Kind



The giant transmitting tube uses the same type of metal shell as the new perfected RCA Metal Tubes, now being used by 48 radio instrument manufacturers.



Figure 1—Front view of RCA Crystal Calibrator.

above, are illustrated in Figures 1 and 2 respectively.

No External Power Supply

For a-c operation the unit is completely self-contained, no external power supply being necessary. The plate of the oscillator is purposely supplied with unfiltered a-c voltage resulting in a 60-cycle modulated carrier at the fundamental and on all harmonics. This is convenient for receiver calibration checks when it is not desired to use the beat note method. A c-w signal free from modulation may be employed, if desired, by connecting an external d-c source to the proper terminals on the instrument. This is preferable where extreme accuracy is de-

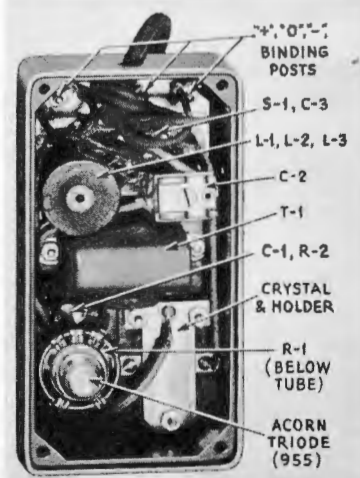


Figure 2—Rear view showing parts of the RCA Crystal Calibrator.

sired since the 60-cycle modulation on a-c operation is slightly confusing when zero beating with a sig-

nificant portion of the positive plate pulse and grid loading over the portion of the cycle that the plate is negative (period of no oscillation). This is overcome by a combination bias-

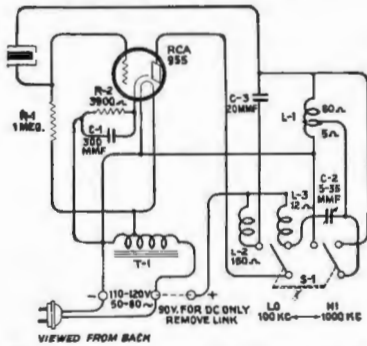


Figure 3—Schematic Diagram of RCA Crystal Calibrator.

ing scheme consisting of a self-bias from the cathode resistor on the

Oscillator		Calibrator		Receiver Setting
Setting k.c.	Harmonic Used	Fundamental k.c.	Harmonic Used	k.c.
90	10th	100	9th	900
100	10th	100	10th	1000
100	10th	1000	1st	1000
100	5th	100	5th	500
110	10th	100	11th	1100
120	10th	100	12th	1200
120	5th	100	6th	600
130, 140, 150	10th	100	13th, 14th, 15th	1300, 1400, 1500
160, 170, 180	10th	100	16th, 17th, 18th	1600, 1700, 1800
190	10th	100	19th	1900
200	3rd, 4th, 5th	100	6th, 8th, 10th	600, 800, 1000
200	10th	1000	1st	1000
200	10th	1000	2nd	2000
210	10th	100	21st	2100

Between 210 k.c. and 1000 k.c., a similar method is used

1000	1st	1000	1st	1000
1500	2nd	1000	3rd	3000
2000	1st	1000	2nd	2000

positive half of the plate cycle and a negative bias from the filament transformer on the negative half of the plate cycle. This is accomplished by returning the grid lead to a point on the transformer so phased that the a-c swing on the grid is in phase with the plate voltage. The positive bias on the grid, obtained from the transformer, on positive swings of the plate, is exceeded by the negative cathode bias by an amount necessary to give required operating conditions.

Crystals Adjusted and Calibrated

In production the instruments are assembled and tested and then sent to the crystal laboratory where crystals are inserted and adjusted for calibration. As stated previously, the 100 kc crystal is set for zero beat with the primary frequency standard and the accuracy of the 1000 kc crystal checked. This data is recorded on the back of the instrument, together with the temperature coefficient for the crystal. A sample calibration would be:

Frequency KC	Correction Cycles	Temperature ° C.
100	± 0.000	25
1000	± 25.	25

Temperature coefficient 20 cycles per 1000 kc per degree centigrade.

Operation with toggle switch set to low side gives 100 kc steps; switch set to high side gives 1000 kc steps. The lower harmonics up to approximately 5 megacycles will be picked up, on a receiver of average sensitivity, by direct radiation with an instrument placed alongside of receiver. For higher harmonic sources, coupling may be necessary. This may be a few turns of wire under the instrument and attached to the antenna input of the receiver.

DISTRIBUTOR LIKES SALES RECORD CARD

Helps Engineers Win Additional Service Tips

"The greatest business builder yet devised for service engineers," said Mr. John Stern, President of the Radio Electric Service Company, RCA Parts Distributor in Philadelphia, Camden and Allentown, when first shown the RCA Three-Point Service System. "And the thing that I like is the ease with which the distributor can keep track of the serviceman's purchases without elaborate time-wasting records. The Sales Record Card does the job quickly and easily for both the service engineer and the distributor," continued Mr. Stern.



J. Stern

The Sales Record Card about which Mr. Stern speaks is an important link in the RCA Three-Point Service Plan. It is a small folded

Radio Flyers



William Burke Miller (left), NBC program executive, and Harold P. See, engineer, pictured shortly before the Philippine Clipper took off from San Francisco on her maiden flight to Manila. Miller broadcasted a step-by-step description of the flight from the plane over NBC networks. See was in charge of the RCA transmitter which was installed especially for the first flight of the Philippine Clipper.

R.T.G. EDITOR LIKES THREE-POINT PLAN

Is Constructive Aid, Says New England Executive

From New England's outstanding service paper — R.T.G. News — comes further endorsement of the RCA Three-Point Service Plan. Mr. Albert C. W. Saunders, Editor-in-Chief of this progressive service magazine says:



"I am very proud to state that I heartily endorse the RCA 3 Point Service System as being constructive and progressive. Also the method of distribution is admirable to say the least.

"Furthermore, the wonderful support that the service engineers have received from your distributors here and the educational significance of factory cooperation will never be forgotten.

"Members of the Radio Technicians Guild of New England join with me in wishing success to all your endeavors which will ultimately arrive at a Utopia populated by men of high calibre."

The service engineer merely presents it when making purchases of RCA parts, or includes it with his order, when ordering by mail.

"101 SERVICE SALES IDEAS" SELLS JOBS

New Book Shows Many Ways For Increasing Service Business

One of the interesting units of the RCA Three-Point Service System is "101 Service Sales Ideas," a book of fact—not theory.

A business either goes forward or backward, it never stands still. And unless a definite amount of promotion is used, it will not go forward. While it is obviously impossible for the small service business to indulge in much advertising, nevertheless there are many ways in which it can be promoted at little cost.

"101 Service Sales Ideas" is written to show service engineers just how their business may be promoted with a minimum of expense and effort. It contains 101 proven selling ideas that have been tried in the field and found to produce results. While, of course, they will not all work in every location, nevertheless there are some that will work in any location. These are not the usual ideas employed by every service man, but odd and unusual ideas which have the distinct merit of having worked in actual practice.

The book is profusely illustrated with pictures showing the way radio service dealers and engineers have applied these ideas to make them produce. By using the other fellow's ideas a service engineer has the benefit of the experience of many successful men.

ORCHESTRA IS CONCEALED FOR FINER EFFECT

Philadelphia Orchestra Is Reproduced Electrically for Ballet Set

Realizing an idea which he had carried in his mind for more than a year, Leopold Stokowski, noted orchestra leader, recently directed a unique performance of Igor Stravinsky's "Rites of Spring" ("Le Sacre du Printemps") in which the composer's stirring music was transmitted by an invisible orchestra as the audience watched the enactment of the famous ballet music on the stage of the Philadelphia Academy of Music. The presentation was a feature of the third Concert for Youth given this season by the Philadelphia Orchestra Association.

Illusion Lost

It has long been Mr. Stokowski's thought that much of the illusion of stage productions is lost by the sight of a large body of musicians in motion before the audience. Also, lighting effects are often marred, he feels, by the light from the musicians' music stands. During scenes where it is wished to emphasize complete darkness, or when a single spot of light is focused on a dark stage to produce a dramatic effect, light leaking from the orchestra may spoil it. In recent months Mr. Stokowski has been in close touch with RCA Photophone engineers at Camden, N. J., who have been making important advances in the realistic reproduction of sound. Following conferences with Max C. Batsel of the RCA Photophone laboratories, Mr. Stokowski's long cherished idea became a practical reality, for recent technical developments have made possible new facilities of a flexibility and quality of performance which open up a new field of possibilities for the concert stage and theatre.

Behind Stage

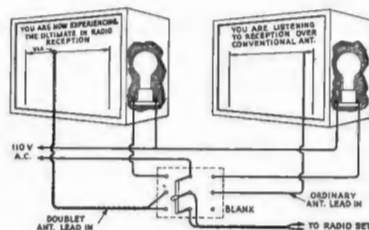
Workmen cleared the space behind the stage shell, where the orchestra was to be hidden, put up suitable drapes and hangings to concentrate the sound, and installed the

SELLING TIPS

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

Antenna Demonstration Equipment

An excellent way of demonstrating the superiority of the Noise-Reducing all-wave antennas is to make up a visual indicator as shown on the illustration. This consists of an ordinary sign, with the antenna system in use drawn in. A switch is used that shifts the



illumination of the sign as the antenna is changed, thereby showing the customer the difference in the antenna being used at the same time that he is hearing such a difference.

H. B. Esterly,
16 E Kings Highway,
Audubon, N. J.

Second Outlet

An additional source of revenue that may be had on practically all service jobs is the installation of a single or double electrical outlet either at the back or on the bottom of a radio set. Practically all radio set owners have a lamp or clock on top of the set, and the addition of a receptacle is a very great convenience. This receptacle should be of the flat hard rubber or bakelite type, about 2 1/2 inches wide, 4 inches long and 3/4 inch in thickness. The advantage gained by such an installation is the absence of lamp cords hanging from the radio to the base-board outlet. By using the receptacle installed on the back of the set for the clock or lamp, a much neater and more simplified job is obtained. Practically everyone I have mentioned this to is a sure prospect, and the people I have done the job for are more than pleased with the convenience it affords them. It is also very handy for use as a trouble light when servicing the receiver, and the additional income derived from such work is well worthwhile the small amount of time that it takes to do this job.

Frank H. Perry,
139 Lily St.,
Paterson, N. J.

The Tin Can Midget

One of the toughest jobs the service man is called upon to do is to service the Gyp Midget. The desire for business sometimes overshadows the reputation at stake. I have found it to be the best policy to be frank in a pleasing way. Cast no reflection on the customer's judgment, but make your side of the case plain. If you recommend servicing the set with the same cheap kind of materials already used in the set, let it be known. If you are servicing with standard parts, show the advantage of such use, and why you must charge a higher price. And don't forget to point out that your labor in each case is the same, and is also the greatest part of the bill.

Virgil Whitehead,
Latona Radio Service,
9026 Latona Ave.,
Seattle, Washington.

Station Log

The following station log has been successfully used for some time. It is an old idea, but just as good today as ever.

The matrix advertising the RCA

Antenna is free as you know (Note: A new mat on the RK-40 Antenna is now available.) I paid one dollar and twenty-five cents for a plate. The printing cost of two thousand cards was four dollars and fifty cents.

In the last three months I erected four RCA Antennas and have had numerous service calls, all of which I attribute to these logs. The cards were distributed in various ways. Two boys took about five hundred



Stronger stations and less noise are secured by connecting your set to an RCA World-Wide Antenna. PRICE \$6.00 Installation Extra.

Your Station Log

Call Letters	KC.	City
WFIL	.560	Phila.
WIP	.610	"
WRAX	.920	"
WPEN	.920	"
KYW	.1020	"
WCAU	.1170	"
WHAT	.1310	"
WTEL	.1310	"
WDAS	.1370	"
WCAM	.1280	Camden
WIBG	.970	Elkins Pk.
WOR	.710	Newark
WEAF	.660	New York
WJZ	.760	"
WABC	.860	"

Your Imprint

FRONT

each and dropped them in mail boxes in the neighborhood. I use them as envelope stuffers when writing to prospects or old customers who haven't called me for some time. I leave a few logs on each service call and hang one on a small finishing nail which I tack in back of the radio cabinet.

When I come across a set not calibrated in kilocycles, I use my RCA Oscillator to find the spots where the usual stations come in and mark the new numbers on one of the log cards. It takes but a few minutes and the customer likes it.

Henry Koch,
252 Diamond St.,
Philadelphia, Pa.

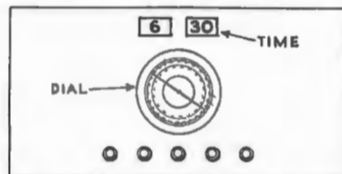
Leaves Set

Whenever it is necessary to take a set to my shop, I always leave a small midget in its place. This gives the customer a set while his own is being repaired which is in many cases superior to his old one. It keeps the customer much more satisfied and often results in the sale of a new set.

S. & H. Radio Service,
419 Porter St.,
Philadelphia, Pa.

Radio Clock

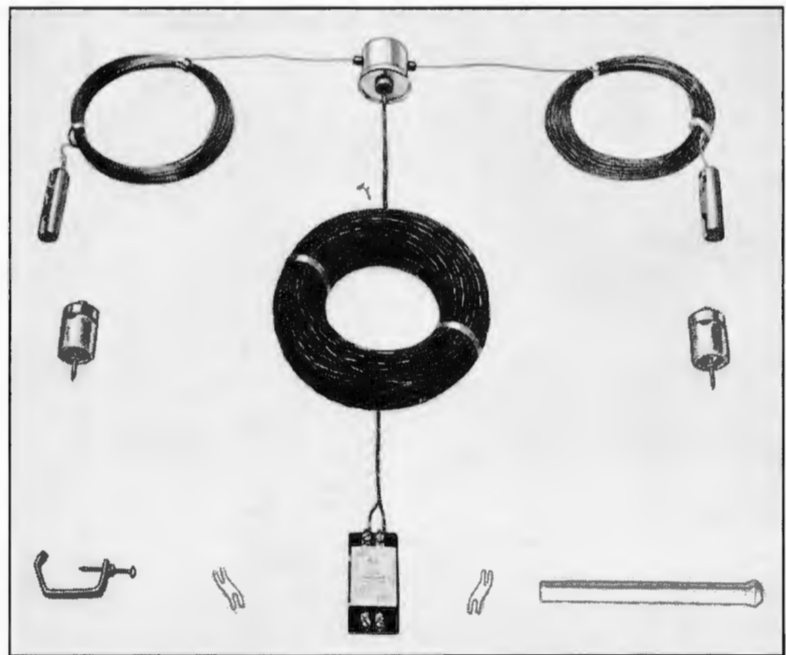
Radio programs and time are inseparable. I conceived upon the idea that an electric clock should be part of a radio and installed a clock of the small jump watch type on my own radio. This type of clock gives the time, such as 6:30-7:45, etc., and does not require the space that



a clock with a dial does. Since installing this clock on my radio, I have had several jobs of this description to do for people who have seen mine and wanted the same. The illustration gives an idea of how it looks. Of course, on some radios there is not room enough for this clock behind the panel.

Frank H. Perry,
139 Lily St.,
Paterson, N. J.

No Soldering Necessary



A feature that appeals to all service engineers who install the new RCA RK-40 Antenna is the absence of any joints to solder. Complete factory assembling makes it necessary only to fasten each end of the antenna to a support and connect the coupling unit to the receiver for a highly satisfactory all-wave antenna installation.