RADIO SERVICE NEWS

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

DECEMBER, 1938 CAMDEN, NEW JERSEY Vol. 4, No. 5

1939 RCA TUBE PLANS FEATURE RADIO SERVICE

Include Use Of Local Newspaper Advertising

Plans for the promotion of RCA Radio Tubes during 1939, will be definitely designed to appeal to radio owners to change radio tubes and have their radio sets checked at least once a year, according to F. E. Crain, of the RCA Radio Tube Advertising Department.

"It is a well-known fact," said Crain, "that the condition of radio tubes is an important factor in the performance of a radio receiver. However, in view of the fact that there are thousands of radio sets in use today that are operating only 50% efficiently, a definite appeal of this type must be made to stimulate radio service and replacement tube sales."

To sell this idea to the consumer, RCA has planned a complete advertising program for the entire year of 1939. This program, as contemplated, sets up four separate and distinct promotions, the first of which will be available January 1 and will be in operation during January, February, and March.

To Have Four Promotions

"The four promotions will be incorporated as part of the 1939 Window Display Service," said Crain, "and will involve the use of window displays, direct mailing pieces, counter cards, handbills and other material which will acquaint radio owners with the fact that for better radio reception, radio tubes should be replaced at least once a year. The material in each promotion will be made available to dealers in kits so that they may begin to place them in operation immediately."

Dealers who are interested in obtaining this material and taking an active part in the 1939 RCA Radio Tube program should place their request with distributors for this new Service as soon as possible so that shipments of the first promotion may be made on January 1.

RCA WISHES YOU A MERRY CHRISTMAS –A PROSPEROUS NEW YEAR

At this time of the year, it is fitting that we wish our friends and associates—the Radio Service Dealers—the best of the season's greetings—a sincere Merry Christmas, a truly prosperous New Year.

The year just drawing to a close, 1938, has been a period of increasing prosperity to us both. You have used more of our products—we in turn have backed you up with quality merchandise and reliable technical information. Thus, by co-operating, we have both benefited.

In the year to come, we believe there will be an even closer and more profitable association between RCA and radio service dealers. At the moment, we are approaching the end of the long road that leads to television. Neither you nor we know just what awaits us at the end of this road—perhaps a new industry. However, even before the end of the road was reached, RCA was making it smoother for you. Comprehensive articles on television have been published in RCA Radio Service News, new test equipment has been developed to cope with new problems, intricate technical problems have been solved. In other words, in the whole project of television the radio service dealer has been continually in the minds of those who have made this development possible.

For it is only by building a future for you that we can hope to build a future for ourselves. We know that in building such a future, we insure the cooperation and loyalty of that great group that has made our past progress possible—the Radio Service Dealer.

Now Ready

The new RCA Victor Radio Tube Sales Aid Folder which lists more than 35 items is now available from your RCA Victor Distributor. Included is a self-starting illuminated Hammond electric clock, a new parchment sign which has the appearance of an expensive Neon sign, an all-metal flange sign lithographed in four colors and many other promotional items to add prestige to any business.

New Tube Tester Offered With Purchase Of 250 RCA Tubes

Nine other Units of RCA Test Equipment available on equally attractive terms — Offer Expires Dec. 31 1938

The completeline of RCA Test Equipment, is now being offered to all RCA Radiotron, RCA Victor and Cunningham Radio Tube purchasers, according to a recent announcement by L. W. Teegarden, Manager of RCA Renewal Tube Division. "Now by merely purchasing RCA Radio Tubes at the regular price," said Teegarden, "any radio service engineer may obtain the world's finest test equipment at no additional cost. This offer, which we believe is without precedent in its liberality, is for a limited time only and gives every service engineer and radio dealer an unexcelled opportunity to modernize their radio service equipment. Because of its unusual nature, this offer expires on December 31, 1938."

The new RCA Radio Tube Tester, offered in this attractive deal, is without question one of the finest and most easily operated testers that has ever been offered to radio dealers and service engineers. It uses a simplified inter-locking push-button assembly which automatically retains or releases the buttons as required in testing. A fully enclosed roller chart gives complete information for testing all receiving tubes. Guide lines simplify setting the switches while the small size and light weight of the tester make it a favorite with service engineers. An important feature of the RCA Radio Tube Tester is its ability to test practically all types of receiving tubes. Magic Eye tubes are tested for brilliance and opening and closing of the eye, voltage drop is tested on gas types, while a phone jack provides a noise test for four prong and octal base ballast tubes.

All Oscillographs Included

In addition to the new RCA Tube Tester, which Service Engineers everywhere are acclaiming as the finest ever, nine other pieces of RCA Test Equipment are included in this generous offer. These instruments are, the 3 inch, 2 inch and 1 inch Oscillographs, the RCA A-C operated and Electronic Sweep Test Oscillator, the RCA Universal Bridge, the RCA Piezo-Electric Calibrator, the RCA Beat Frequency Audio Oscillator and the RCA Frequency Modulator. Also, all volumes of RCA Victor Service Notes which all electrodes including the

(*Continued on page 2, column 1*)

Single-Ended Pentodes Are Added To Line

Control grid terminates in base pin

Two new pentodes, a high mu triode and a duplex diode high mu triode of radically new construction have just been announced by the RCA Renewal Tube Division. Each of the new types are available in the RCA Radiotron, Cunningham and RCA Victor brands. They are for replacement use in a number of new radio instruments which are now employing them.

These tubes are:

RCA-6SF5—High-Mu Triode

RCA-6SJ7—Triple-Grid Detector Amplifier

RCA-6SK7—Triple-Grid Super-Control Amplifier

RCA-6SQ7—Duplex-Diode High-Mu Triode

These new single-ended tubes, in

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Fine Performance Is Feature Of New RCA Power Tubes

Two RCA-810's take one K. W. input

Two outstanding new power tubes, one the RCA-810 high-mu triode and the other—the RCA-813 beam power amplifier, have been announced by all RCA Power Tube Distributors. These two tubes are worthy additions to the RCA Power Tube line and are of special interest to amateurs and experimenters who desire high power rigs.

RCA-813

The RCA-813 is the largest tube in the RCA beam power amplifier group. It requires no neutralization and makes an excellent final amplifier for a quick band change, high powered amateur transmitter. In class C service, the RCA 813 has a power output of 260 watts with less than 1 watt driving power. The Amateur Net price is $28.50.

The RCA-813 is characterized by unusually rugged construction and employs a new stem structure which makes practical a compact tube—only 7½ inches long—having very heavy short leads and low lead inductance. Because of its design, the RCA-813 can be operated at full ratings up to 30 megacycles without neutralization.

RCA-810 High-Mu Triode

The new RCA-810 is a high power triode of traditional RCA quality and unusually fine performance and having the attractive amateur net price of only $13.50. It is of the high-mu triode type and

(*Continued on page 4, column 5*)

New Sperry-RCA Aid To Air Navigation

New Sperry-RCA Automatic Direction Finder installed in American Air Lines Douglas Sleeper. Photo shows W. H. Dum, American Air Lines pilot, left, and Lieut. Richard Burke, U. S. Coast Guard, Commander of Coast Guard Air Base at Cape May, New Jersey, discussing the operation of this device after demonstration flight at Floyd Bennett Field on October 12. This Direction Finder, when once tuned to a station, points continuously and automatically at the station so that the pilot need pay no attention to its operation, merely glancing at the pointer on its face

In RCA Ad

Beauteous blonde Ida Vollmar, made such a hit in an RCA Victor Saturday Evening Post full color ad, that she was invited to appear on the RCA Magic Key program of November 20

Voltage Regulator Tubes Operate On Wide Load Changes

New Types RCA-VR105-30 and RCA-VR150-30 have many uses

Two new voltage regulator tubes, designed for a wide variety of applications, have recently been announced to radio amateurs by RCA Power Tube Distributors. Both tubes are identical, except that the VR105-30 is designed for 105-volt circuits while the VR150-30 is designed for 150-volt circuits. Each carries an amateur net price of $1.25.

These tubes are of the cold cathode, glow discharge type, intended for applications where a constant DC output voltage is required for varying values of DC load current. They also may be used as an oscillator in relaxation circuits and for spark-over protection.

Ratings and Characteristics

RCA-VR150-30

Starting Supply Voltage (DC)	180 min. Volts
Operating Voltage (DC)	150 approx. Volts
Operating Current (DC)*	5 min. Milliamperes
	30 max. Milliamperes

RCA-VR105-30

Starting Supply Voltage (DC)	137 min. Volts
Operating Voltage (DC)	105 approx. Volts
Operating Current (DC)*	5 min. Milliamperes
	30 max. Milliamperes

* Sufficient resistance must always be used in series with this tube to limit the current through it to 30 ma.

The standard ST-12 small shell octal 6-pin base is used on both tubes. The overall dimensions are 4 1/8" high and 1 9/16" maximum diameter.

New RCA Tester Is Offered With Tube Purchases

(*Continued from page 1, column 4*)

are included at only 10 tubes per volume!

The tube purchases of the above RCA Test Equipment are as follows:

Item	Stock No.	Net Price	Required Tube Purchase
RCA Tube Tester, Counter Type	156-A	$37.95	250
RCA Tube Tester, Portable Type	156	39.95	275
RCA 3" Cathode Ray Oscillograph	155	63.95	450
RCA 2" Cathode Ray Oscillograph	151-2	49.95	350
RCA 1" Cathode Ray Oscillograph	151	39.95	275
RCA Electronic Sweep Test Oscillator	150	64.50	450
RCA A-C Test Oscillator	153	29.95	200
RCA Piezo-Electric Calibrator	9572	29.95	200
RCA Universal Bridge	9600	49.65	350
RCA Beat Frequency Audio Oscillator	154	49.95	350
RCA Frequency Modulator	9558	27.50	200
Bound Volumes of Service Notes	100-107	1.25 ea.	10

RCA Victor "Little Nipper"

Model 9TX-1 is a genuine RCA Victor five tube superhetrodyne receiver featuring the attractive Eastern List Price of only $9.95. This same chassis is also supplied in four other attractive cabinets that list from $12.95 to $17.95

Has One-volt Output

A high output of one volt for locating trouble in inoperative receivers is an important feature of the RCA No. 153 Test Oscillator. This fine unit has a host of desirable features, yet retains the low net price of $29.95 complete, ready to operate.

Long Life Needle Is Developed For Coin Phonographs

A new needle especially developed for coin phonographs, after nearly four years of research and experiment in RCA Victor's famed sound laboratories, has been announced by Edward Wallerstein, Manager of Record Sales for RCA Victor. It was designed to assure longer record life, higher fidelity performance, lower surface noise and longer needle life.

The new needle is manufactured with a special welding process which gives it extra strength where the special-alloy shank joins the tip. The necessity for a point that would withstand the shock of impact when the needle first hits the record and, in turn, wear the record less, led to the selection of a precious metal for use in making the tip. In addition, the angle of the tip is projected to give maximum strength and minimum wear.

The shank has been impressed with a "V" to identify the needle.

Large Dial Is Unique Feature Of Oscillator

Six Scales extends over 50 inches

The RCA a-c operated test oscillator, No. 153 is finding increasing favor with service engineers because of the exceptional value it offers. While retaining a low net price of only $29.95, this oscillator has features that are found only in considerably more expensive units. As every service engineer knows, ownership of an accurate wide frequency range oscillator is a necessity for servicing modern radios and offering a complete service to their customers. The RCA No. 153 Oscillator fills every requirement—at a price every service engineer can afford.

The large dial of the RCA a-c test oscillator is 6½ inches in diameter and contains a total scale length of over 50 inches. A transparent pointer with a hair line index makes accurate setting easy while an easy tuning vernier knob facilitates setting to the desired frequency.

Uses Metal Tubes

An important feature of the RCA No. 153 Oscillator is the use of RCA All-Metal tubes. Use of these tubes eliminates the necessity for tube shielding and increases stability of the circuits. This is especially important in this oscillator which has the wide range of 100 to 30,000 K.C. If higher frequencies are required, the harmonics of the last range may be used for ultra high frequency testing.

The maximum r-f output voltage is 1.0 volt, provided by the high tap. This is essential for locating trouble in an inoperative or completely misaligned set or for single stage alignment work. Variable output is provided from minimum to 0.25 volts by means of two taps and an adjustable control. An external frequency modulation jack is provided for use with a sweep condenser when the oscillographic method of alignment is used.

Has 400 Cycle Modulation

Internal modulation of 30% at 400 cycles is provided. Also, this frequency may be obtained as a separate output of approximately 8 volts for audio circuit testing. The complete specifications are as follows:

R. F. Frequency	100-30,000 kc.
No. of Bands	6
R.F. Output	Low .01 volt max.
	Medium .0.25 volt max.
	High 1.0 volt max.
Minimum Signal	2 Microvolts
Leakage	Negligible
Output Impedances	Low 10 ohms
	Medium 750 ohms
	High 4000 ohms
Calibration Accuracy	2%

Tubes—

RCA5W4 Rectifier, RCA-6C5 Audio Oscillator, RCA-6K8 R-F Oscillator

TELEVISION SETS TO BE READY WHEN N.Y. WORLD'S FAIR OPENS

Limited Program Service to Be Available in New York Area at That Time, Reports RCA President

In a statement recently made to the Radio Manufacturers' Association in New York City, David Sarnoff, President of the Radio Corporation of America, said that television receiving sets would be available to the public when the New York World's Fair opens on April 30, 1939. A part of Mr. Sarnoff's statement follows:

"We are aware, however, that many technical, artistic and financial problems still confront those who would establish an acceptable and regular public service of television programs to the home. These problems must be solved before a national service of network television programs can be made available to the public. Meanwhile, RCA, which has pioneered in the development of television, has made substantial progress first, in its research laboratories and second, through its field tests and experimental broadcast programs. We believe that the problem confronting this difficult and complicated art can be solved only by operating experience gained by actually serving the public in their homes. Therefore, RCA proposes to take a third step in the solution of these problems by beginning a limited program service to the public from its New York television transmitter on the Empire State Building. This transmitter will serve an area having a radius of approximately 50 miles.

To Demonstrate at N. Y. World's Fair

"As publicly announced some time ago, RCA proposes to demonstrate television to the public at the New York World's Fair, which is expected to open on April 30, 1939. The National Broadcasting Company contemplates that by the time the Fair opens, it will be on the air with television programs for at least two hours out of each week. Recent reports in the public press are to the effect that the Columbia Broadcasting System contemplates installing its television transmitter in the Chrysler Building in New York City. These reports further indicated that television programs will be transmitted from this station by the time the World's Fair opens.

"The RCA Manufacturing Company, which built and sold the television transmitter to Columbia, has offered and is prepared to sell tele-

(*Continued on page 3, column 2*)

Manual Motor Board Is Fine For Sound Use

Uses RCA Senior Crystal Pickup Arm

The RCA Manual Motor Board Assembly, introduced but a few months ago, is rapidly finding favor with service and sound engineers everywhere, according to L. A. Goodwin, Jr., of the RCA Parts Division.

"The wide range of the RCA Senior Crystal Pickup, which is essentially flat from 70 to 7,000 cycles," said Goodwin, "is an important feature that appeals to those who want the finest in record reproduction.

"The top loading needle socket and the automatic needle ejector, which is combined with the used needle box, are other unusually attractive features," said Goodwin.

Stock No. 9850

Other outstanding features of this unit are a self-starting motor, an automatic record stop and a pickup shorting switch which prevents extraneous noises from being reproduced through the loudspeaker when not playing.

A highly interesting and useful feature of the RCA Manual Motor Board Assembly is the rubber spindle cap which prevents vibration transfer to the record. Shock proof spring mountings are furnished to suspend the Motor Board Assembly from the cabinet and thereby avoid inter-action which might produce microphonics, etc. The entire assembly is finished in brown wrinkle lacquer. The turntable is 9" in diameter, while the overall dimensions are 14¾" wide by 11½" deep. Clearance of 3" is required below the board while clearance of 3¼" is required above the board.

Courtesy *This Week*

"That's the reason you have static! madam."

RCA Desk Sound System

The new MI-6719 RCA Desk Console Sound System is an ideal unit for educational institutions having from 20 to 120 classrooms. It includes two channels, an automatic phonograph and flexible controls

New RCA System Provides School Sound Service

Desk-Type Instrument Features Two-Channel Operation

A new sound system for schools, designed, engineered and manufactured to provide for every radio and sound equipment of the modern educational institution of from 20 to 120 class rooms has been announced by Ellsworth C. Dent, RCA Victor's Educational Director. The new unit is built into a desk-type console cabinet for greater utility and ease of operation. It features an unusually attractive price.

The new school system which is known as MI-6719 includes all the earlier standard provisions of RCA Victor's finest school systems, such as two radio receivers, phonograph, a microphone for making announcements, and two-way communication with any or all rooms, according to Mr. Dent. It features two-channel operation.

Has Provision for Recording

Provision for recording and instantaneous play-back of speech, music or radio programs is a highly desirable feature of the MI-6719 unit. An electric clock of highest quality is conveniently placed on the control panel, and a standard meter is used to aid in regulating the volume of both recording and reproduction. There are two monitoring loudspeakers, one for each channel.

"One of the outstanding features of the new model is its low cost," Mr. Dent said. "The rapidly increasing use of this type of equipment has made it possible to increase production sufficiently to provide a more complete instrument than ever before at a substantial reduction in price."

Both radio receivers include an ultra-high frequency band which will permit the installation of an attachment for radio television reception, when such programs become available for use in schools.

The cabinet of the MI-6719 unit is of unusual design and beauty, resembling an executive-type desk with a raised control panel facing the operator. The radio receivers are installed in either end of the console, with attractive loudspeaker grilles in the "wrap around" type corners. The phonograph is in the center, covered by a sliding top which may be used as a desk when the phonograph is not in use.

RCA Portable Has Directional Pickup Feature

Makes Excellent Unit for Interference Work

The new RCA Victor "Pick-Me-Up" radio, Model 94B-P4, makes an excellent unit for tracing interference, locating antenna positions and many other phases of service work where a highly sensitive, battery operated portable instrument is required. This instrument, which is now being featured by RCA Victor distributors, carries the attractive list price of only $29.95, less batteries. A complete set of batteries lists for only $3.50, and gives unusually long service.

Directional Loop

The feature of this new portable that makes it particularly attractive to service engineers is that the antenna is a tuned loop, highly directional and very sensitive. Actually, the loop is the first tuned circuit and operates in a similar manner to radio compasses, used by aircraft and ships at sea. If it is desired to install the "Pick-Me-Up" radio permanently at one location and greater pickup is required, binding posts have been provided for antenna and ground connection. However, for all ordinary locations, the built-in loop gives excellent pickup.

The instrument employs the newly-developed RCA Victor low-drain tubes for long battery life. It has a permanent magnet dynamic loudspeaker which delivers volume and tone of unusual excellence for its size. Its powerful superheterodyne circuit utilizes magnetite core coils to insure permanent alignment of the radio circuits, regardless of weather conditions.

RCA Victor Model 94B-P4 Portable Radio

Has Many Other Features

Other important features include:

Tuning Range: One band, 540 to 1500 kcs., covering complete domestic broadcast band. Easy-reading Clock-type Dial; 8:1 tuning ratio.

Tubes: RCA Victor 1A7G; 1N5G; 1H5G; 1C5G. 1.4-volt, low-drain tubes for longer battery life.

Batteries Required: "B" Batteries, two 45-volt (Plug-in type). "A" Battery, one 1½ volt (Plug-in type) Dry Battery.

Battery Drain: "A" Battery Drain, .25 Amperes — "B" Battery Drain, 9 milliamperes.

Cabinet: Sturdy Construction. Smartly finished in latest type Airplane Luggage Cloth of subdued tan. Height 8", Length 14", Depth 8¼".

PLUS—Powerful Superheterodyne using 6 tuned circuits, Magnetite Core Antenna, I-F and Oscillator Coils for permanent alignment of circuits. Low-Drain RCA Victor Tubes, Permanent-Magnet Alnico Dynamic Speaker, Automatic Volume Control.

Eucharistic Meet Served by Powerful RCA Sound System

15 Powerful Church Installations Provided by RCA in New Orleans

A striking demonstration of the value of sound reproducing systems in covering huge outdoor gatherings as well as smaller groups in churches and auditoriums was provided at the Eighth National Eucharistic Congress at New Orleans. The four-day conclave was served by the largest and most powerful RCA sound system network ever installed in the city.

Four powerful 100-watt loudspeakers installed in the belfry of St. Patrick's Church gave thousands in the central section of the city first-hand knowledge of the events of the Congress, including the broadcast message of Pope Pius. In addition, sound systems employing two or three altar and pulpit microphones and two to 12 loudspeakers, depending on the size of the church, were installed in fifteen churches throughout the city to accommodate over-flow crowds.

Eight Systems Used for Sectional Meetings

Eight other systems were placed at outdoor locations for sectional meetings of clergymen and delegates. A complete paging and announcing system, which was also used to reproduce recorded music, was placed in the Civic Auditorium, where the work of Catholic missions in all parts of the world was on exhibit. The new RCA Mobile Broadcast unit, employing four powerful loudspeakers, was installed in an automobile for use in clearing the streets of the pressing thousands of on-lookers preceding the processions.

Most Complete Ever Installed

Standard RCA altar microphones, equipped with desk stands and coated to match other articles on the altar, were placed in all churches to pick up the words of the priests conducting services.

"The sound system network was one of the most complete we have ever installed," said Bernard J. Sullivan, special representative of the commercial sound section of the RCA Manufacturing Company, who supervised the installation. "The interest aroused among clergymen and other ecclesiastic delegates, particularly by the sound units placed in churches, should result in many more applications of sound reproducing systems in that field. For several years churches of all sizes and denominations have been turning to public address systems to solve their sound problems, and we look for the successful demonstrations given by our system at the Congress to spur on that trend."

Busy Girl

Margot Stevenson keeps busy these days by appearing in "Aunt Jenny's Stories" heard over CBS, Monday through Friday, at 11:45 A.M. to 12:00 Noon, posing for pictures, and then hopping over to Broadway to fill her role in "You Can't Take It With You"

PRICES CUT ON MANY RCA POWER TUBES

RCA-203A and RCA-211 Now List at $10.00, Amateur Net

Announcement of substantial price reductions on eleven popular power tubes has just been made by D. Y. Smith, Manager of the RCA Power Tube Division. "These new prices," commented Smith, "are a result of RCA's constant endeavor to give the greatest value possible, consistent with the extremely high standard of RCA tube quality. Now, famous RCA quality may be obtained at the lowest cost."

The tubes included in the new price reduction are—

Type	Old Net Price	New Net Price
203-A	$15.00	$10.00
204-A	97.50	85.00
211	15.00	10.00
803	34.50	28.50
837	8.50	7.50
838	16.00	11.00
845	15.00	10.00
849	135.00	120.00
866-A	4.00	2.50
872	14.00	9.00
872-A	16.50	11.00

Bonus Polish

This one half-gallon can of genuine RCA Victor Furniture Polish is given without additional cost when a carton of 12 bottles is purchased at the regular price from your RCA Victor Distributor

Television Sets To Be Ready In '39, Says Sarnoff

(Continued from page 2, column 5)

vision transmitters to broadcasters and others who may desire to enter this new field.

"RCA believes that the development of its television system has now reached a stage where it is practicable to supply television receivers to satisfy the demand of the public in those localities where television transmissions are now or may become available. Therefore, it is planning to manufacture a limited quantity of television receivers which it expects to market by the time the World's Fair opens. We are informed that a number of other radio manufacturers in the United States are also preparing to manufacture and sell television receivers in such areas as may be served with television programs."

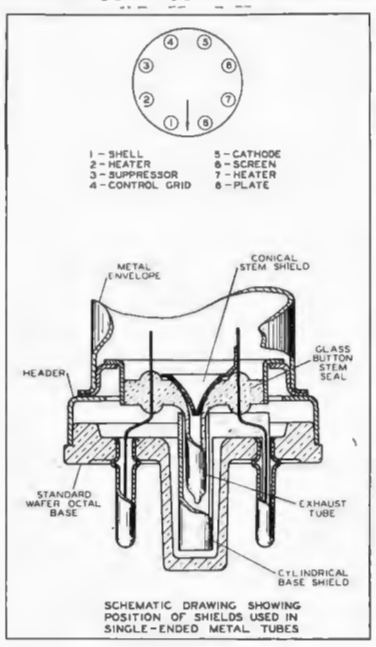
At Eucharistic Congress

Gov. Richard W. Leche, of Louisiana, is shown delivering an address of welcome to George Cardinal Mundelein, Archbishop of Chicago and personal representative of Pope Pius, on his arrival at the New Orleans railroad station to participate in the Eighth National Eucharistic Congress. Cardinal Mundelein is in the right foreground. An RCA sound distribution system was installed at the station to carry the ceremonies to the thousands packed in the streets

Single-Ended Pentodes Are Added To Line

(*Continued from page 1, column 3*)

control grid terminate at base pins, employ a radically new construction with interlead shielding. As a result of this new construction made possible by modern methods of tube manufacture, the r-f amplifier pentodes 6SJ7 and 6SK7 not only have the same grid-plate capacitance as similar capped types, but also have



SCHEMATIC DRAWING SHOWING POSITION OF SHIELDS USED IN SINGLE-ENDED METAL TUBES

lower values of input and output capacitance. Similarly, the a-f types 6SF5 and 6SQ7 offer the same mechanical advantages as the r-f amplifiers. A schematic drawing showing cross-section of the base is shown. Further information may be obtained from your RCA Radio tube distributor or by writing to Commercial Engineering Section, RCA Manufacturing Company, Inc., Harrison, N. J.

FREE

Promotion Package for Radio Tube Dealers

Would you like to get one of these gift packages of RCA Promotional material? If so, then just send your name and address on a post card to the Advertising Department, RCA Manufacturing Company, Camden, New Jersey, and a gift package will be forwarded to you Absolutely Free of charge. Be sure to give the name of RCA Tube brand you sell. Act now because the supply of gift packages is limited.

Promotional Items With a Punch!

No. 3522
Net Price $8.50
Finished in Three Colors
Uses Hammond self-starting motor

No. 3592
Net Price $1.25
Finished in Four Colors

A parchment sign for counter or window use features the Cunningham or Radiotron carton in four attractive colors and comes complete with bracket and cord. These signs give the appearance of expensive Neon signs and are bound to attract attention! Form Nos., Radiotron 3591, Cunningham 3592. Price, $1.25. Be sure and place your order promptly as the supply is limited.

The new illuminated clock is available to Cunningham dealers. It has a Hammond self-starting motor and uses two 30 watt, 110 volt lamps. Finished in three attractive colors. Form No. 3522, Price $8.50.

Service Dealers Order 4500 Tube Promotional Kits

Money Back Guarantee finds wide popularity

That the RCA "Money Back Guarantee" is another "natural" for radio service dealers is evidenced by the fact that orders for more than 4500 kits containing some three million pieces of material have been received to date. This program, which features a one week's guarantee to customers purchasing RCA tubes, plus the additional incentive of a free attractive cigarette box for bringing his tubes in for testing, is one that every radio service dealer should use.

To quote Mr. J. P. Whiting, Phoenix, Arizona, "It has increased my radio tube business almost 50% and in addition has brought in a great many customers who were badly in need of service work."

Mr. Joseph Shaler, a serviceman of Philadelphia, states that he is offering the cigarette box free to customers who call for an RCA 10-point Check-Up. Also, he states that he has worked up a special mailing which will go out announcing the cigarette box offer and following up with the "Money Back Guarantee."

Sells 27 Sets in 4 Days

Mr. Paul Abrahms, of the Fix It Shop, Chicago, writes that he has been able to sell 27 sets of tubes within 4 days on the "Money Back" Guarantee. While he also received a return of 3 sets of tubes, nevertheless the return was made because of other defects in the radio. These were repaired at a profit which amounted to more than he would have made on the tubes.

While this is the first time that such a program has been offered to radio tube dealers, its success has led to the formulation of similar plans for 1939. Service engineers who have not used the RCA "Money Back" Guarantee plan for increasing their tube and service business should get in touch with their RCA Radio Tube Distributors at the earliest possible moment.

Portable P. A. System Uses Two Speakers

Velocity Microphone Insures High Quality

A new low-cost portable sound system which includes two loudspeakers, a sensitive velocity microphone and a 12-watt amplifier in one carrying case, has been announced by W. L. Rothenberger, Manager of RCA's Commercial Sound Section. The system has a list price of $149. F.O.B. Camden, N. J., a reduction of $50. under the

PG-112-B

price of the earlier unit it replaces. It is known as type PG-112-B.

"Because of its low price and high operating efficiency, this system is adapted to practically every type of public address application," Mr. Rothenberger said. "It embodies the latest developments in the amplifier and loudspeakers, and in addition has a velocity microphone, making it an unusual value in its price class."

Permanent Field Loudspeakers

The loudspeakers are of the permanent field dynamic type, with each supplied with 24 feet of cable for connection to the amplifier. The amplifier unit is removed from the two-piece carrying case when in use, permitting the two parts of the carrying case to be used as baffles for the speakers, which are permanently mounted and covered with grille cloth. Separate receptacles are supplied in the amplifier for attachment of the loudspeaker cables, making it possible to use one or two loudspeakers as desired.

Open Elements Easily Checked On RCA Tester

Few tubes require special test sequence

By D. T. Cooper, RCA Engineering Department

A unique feature of the RCA Radio Tube Tester is its ability to test doubtful tubes for possible opens. While ordinarily a test such as this is not required, in special instances it may be done as follows:

1. Depress the "Test" button. Allow sufficient time for the tube to come to operating temperature.
2. Hold down the "Output" button and successively press down the numbered buttons opposite the numbers on the chart for the tube under test starting at the right and proceeding to the left.
3. As each button is pressed the meter pointer should move (some times only slightly). If no movement occurs an open is indicated.

The following tubes require a special test sequence and in two instances a change in "Class" selector switch.

Tube Type	Test Sequence
1A6	45382
1C6	45382
1C7G	54683
1D7G	54683
2A7	53482
6P7G	438
6A7	53482
6A8G	54683
6D8G	54683
1852	416
1853	416
Change Class Selector to L	
6K8	4385
1851	438

New Tubes

Since the RCA Radio Tube Tester Chart was printed, a number of new tube types have been announced by radio tube manufacturers. The proper tests for these tubes are indicated in the following chart which is arranged similarly to the chart in the tester.

Type	Volts	1	2	3	4	Output	5	6	7	8	Class	Type
EK 1000	6.3	1	–	–	–		–	–	7	8	D	23
EK 1000	6.3	–	–	–	–		5	–	–	–	D	29
1221	6.3	–	2	3	–		–	–	–	8	A	32
1223	6.3	–	–	3	4		–	–	–	8	A	32
6AE5(G)	6.3	–	–	3	–		5	–	–	–	A	39
6SJ7(G)	6.3	–	–	–	4		–	6	7	–	A	36
6SK7(G)	6.3	–	–	–	4		–	6	7	–	A	34
6SF5(G)	6.3	–	–	3	–		5	–	–	–	D	37
6SQ7(G)	6.3	1	–	–	–		–	6	–	–	D	33
6SQ7(G)	6.3	–	–	–	4	Diode	–	–	–	–	C	—
6SQ7(G)	6.3	–	–	–	–	Diode	5	–	–	–	C	—
25AC5	25.0	–	–	3	–		5	–	–	–	A	36

Chart Correction

Several minor corrections should be made on the chart of tube testers now in the field. These are as follows:

1C7G	2.0	–	–	–	–		5	6	–	–	B	12
1C7G	2.0	–	–	3	4		5	6	–	8	B	15
2Z2	2.5	–	2	–	–		–	–	–	–	A	25
6C7	6.3	–	2	–	–		–	–	–	8	A	25
6P7(G)	6.3	–	–	shorts	4		5	–	–	8	J	27
6W7(G)	6.3	–	–	3	4		–	–	–	8	A	32
6Z5	6.3	–	–	3	–		–	–	–	–	A	30
6Z5	6.3	–	–	–	–		5	–	–	–	A	30
1852	6.3	1	–	–	4		–	6	–	–	A	41
1853	6.3	1	–	–	4		–	6	–	–	A	39

In addition, the information now printed on the chart for Tube Types 6A5G, 6AB5 and 12A5 has not been fully coordinated and should not be used. Complete details for testing these types will be released as soon as possible.

Demonstrator!

The noise-reducing feature of the RCA Victor Master Noise Eliminator or the RCA Victor Master Antenna System may be easily demonstrated without installing an antenna by means of this demonstration kit.

Fine Performance Is Feature Of New RCA Power Tubes

(*Continued from page 1, column 5*)

has a number of important design features that make it an exceptional value for the amateur who desires a high-powered rig.

RCA-810

Two RCA-810's in a push-pull circuit will deliver a 750-watt carrier for class C telegraphy and a 500-watt carrier for plate-modulated telephony. A feature of this new tube is its low driving-power requirements—a single RCA-809 operating as a frequency doubler will furnish ample excitation for one RCA-810.

Two RCA-810's in a class B modulator circuit operating at only 1500 volts, will deliver more than 500 watts of audio power—sufficient to modulate fully a final r-f stage running at an input of 1 k.w.

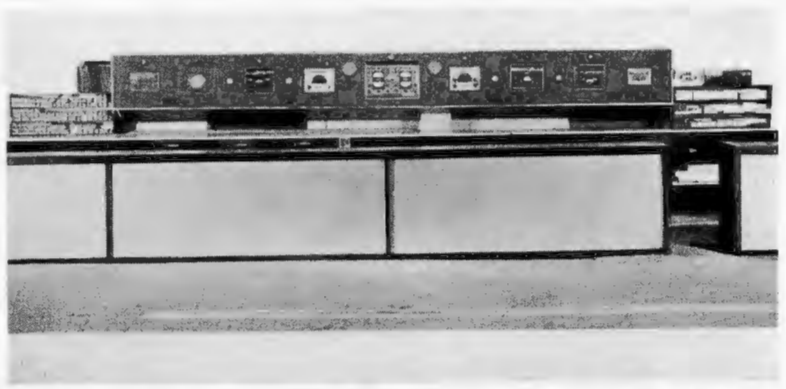
Has Thoriated Filament

This new triode employs a number of new design features. One of these is the use of a heavy-duty thoriated-tungsten filament shielded at both ends, inside the graphite plate structure. This construction conserves input power by eliminating bulb bombardment and stray electrons. The grid cap is brought out to a husky metal cap at the side of the bulb.

40th Anniversary Model

The RCA Victrola U-125, which contains an automatic record changer and an eight tube, three-band radio, is being widely acclaimed as an exceptional value. It is a fitting model to climax RCA Victor's 40 years of leadership in manufacturing sound reproducing instruments

Well-Equipped Auto Radio Service Shop



"Only Satisfied Customers" is the slogan of the Syracuse Radio and Television Company whose service bench is shown above. This company specializes in auto radio service only and does an average of about one thousand new radio installations per year. It is a member of the RCA Auto Radio Service Network

Service Tips

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

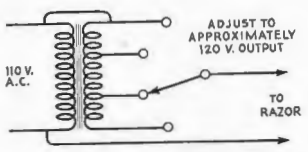
Philco Model 39-55, Mystery Control Receiver

The set would change stations by itself, without the controlling impulse from the local oscillator contained in the mystery control box. Adjusting the sensitivity control on the rear chassis apron to a point where sufficient response to the mystery control was attained, and so that random static surges from the antenna by impact excitation had no disturbing effect, a degree of satisfactory operation was achieved. Some difficulty was experienced when manually turning on and off the radio. The fault lay in the bakelite gear which serves as the volume control knob, projecting through the front panel. The gear teeth were chipped and the bakelite knob-gear had to be replaced.

Willard Moody
Edison Shop
30 Irving Place
New York, New York

Line Voltage Booster

Several hints have been sent in regarding use of transformer for raising line voltage. If some of your customers complain their electric razors will not get up enough speed



for good shaving try following hook-up. Be sure that secondary is in phase so that secondary voltage adds to line voltage. Reference on other uses of this hook-up in May, 1936, and November, 1937, issues of RCA Radio Service News.

Clifton S. Krumling
315 East 2nd Street
Blue Earth, Minnesota

Philco 17 and Others

This tip applies to all Philco receivers using a condenser across the speaker field. When a strong 120-cycle hum is heard in these receivers, before disconnecting and testing other condensers, check the condenser connected across the speaker field for open circuit. This is quickly done by shunting a good condenser of the correct value across the terminals of the suspected condenser, and noting the effect upon the hum. If the old condenser is open, remove it entirely, installing a new one in its place. This trouble is quite common in these receivers.

R. K. Wheeler
2308 Park Avenue
Indianapolis, Indiana

Metal Tube Modernization

This radio is a Zenith 1938 Armchair model, and my diagnosis shows that microphonic tubes due to a resonant frequency in the cabinet was the trouble. I have contracted to clear up this trouble with metal tube installation. However, as the radio had just been sold, the dealer replaced the microphonic tube with another glass tube. I decided to see what this would result in. For several months the trouble was cured, but now has again started. The result is, as I see it, this radio, due to its cabinet construction, has a resonant period which causes the glass tubes to vibrate and become microphonic. This may appear only in this cabinet, but there is no question but that glass tubes cannot be used and also clear up this trouble. I have been requested to make the metal tube installation as a result. This incident was interesting to me and I thought you might be interested in this experiment.

Mr. P. M. Ohlinger
Ohlinger Radio Laboratories
Portsmouth, Iowa

Metal Particles in Speaker Fields

This is generally one of the most exasperating problems, due to the fact that the particles are almost always magnetic (iron or steel) and will cling to the field poles. These particles get in in various ways and all too often are due to the Serviceman himself. For example, when the output transformer is being replaced and the rivets are drilled out.

The result of these chips or filings is noise and terrible distortion. They must be removed and the easiest way is to apply A.C. direct to the field, which destroys the residual magnetism and allows the metal particle to be blown out or wiped out with a magnetized steel shim.

Use 110 volts A.C. for the regular household set speaker and 10 or 20 volts for automobile speakers.

George H. Koether, Jr.
Severna Park, P. O.
Round Bay, Md.

Philco 39-25

Radio played when using "instant tuning" but was dead when switched to Manual Tuning.

I have had two jobs like this and each time it was broken lead between tuning condenser stator section and chassis.

A quick visual check of this connector before testing otherwise may save time on similar jobs.

C. H. Carrier
Hawkinsville
Georgia

Tuning Condensers

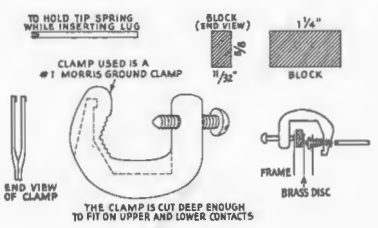
In radios using dial belts or cable for drive, make sure variable condenser is free to move before replacing dial belt. Most condensers have a tension adjusting screw in the rear of condenser. Loosen lock nut and let screw out just enough to free condenser. Put in a drop of Nujol between condenser shaft and bearing, then adjust set screw and tighten lock nut, making sure the plates of condensers are equally spaced. Then as a finale, check the padders for peak. On some dial belts, by simply turning the belt over so that the outside of belt is on inside and inside on the out, slipping will be cured.

Bernard Cammarro
Radio-Lab
266 Lindley Street
Bridgeport, Connecticut

Electric Tuning Tool

On one or two occasions I experienced difficulty in removing the setting contact from the frame, so I devised this clamp and block assembly, which cut down the time for reassembling to one-fourth.

All that is required is a regular ground clamp (such as shown in the sketch — cut according to the

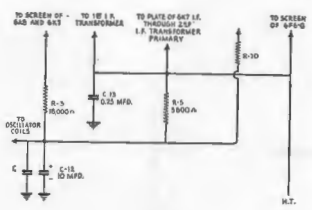


dotted lines) and a metal rod of the same size as the interior of the contact body, with a suitable slot cut, as shown, to allow inserting the lug behind the tip spring. The wood block is used to hold the body rigidly while the clamp is pressing down the washer and body spring.

Mr. J. R. Neubauer
Radio Service Engineer
4444 Clay Street
Denver, Colorado

RCA Victor Models 5T8, 5Q2, 7T1 and 5Q1

The reception on the 13 meters band in the above models is very mushy and it was found that this was due to the oscillator frequency being modulated by the Power Supply Frequency. The trouble was

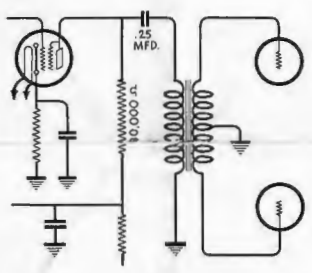


put to an end by the addition of a Condenser of value between .002 to .005 mfd. from the terminal on the Oscillator Coil where the plate voltage enters the Oscillator Coil to Earth as shown schematically on the diagram.

M. E. Nagarajan
1/18 Mount Road
Madras, India

RCA Model T 10-1

The general trouble has been found in the a-f transformers on these models. When replacing



transformers I have found a paralled feed by using a 30,000 ohm resistor and a O.25 Mfd. capacitor eliminates further failures from open circuits.

R. S. Sahota
P. O. Box 409
Dar es Salaam.

Soldering Iron Holder

Secure one off the old style 5Z4's, the one with the ventilated cage surrounding the elements. Simply remove the octal base and rectifier elements. Line the inside with asbestos and that's all there is.

Harry Berman
1310 Grand Avenue
Bronx, New York

Zenith Models 430 and 440

Noisy and weak reception on the above models is caused by poor connection of the I. F. transformer trimmer condensers.

The plates of these compression type trimmers are riveted together at the ends and they oxidize with time.

Remedy: Solder the ends and rebalance at 175 KC, also to improve tone quality, eliminate the choke and condenser tone compensating assy., which is wired from tone tap of the volume control to ground.

Louis Pallin
Pallin Radio Lab.
276 W. Congress
Chicago, Illinois

Motorola Model 10Y Chassis 10-1

A very annoying noise noticed only on the broadcast tuning range can be traced to the RF broadcast coil which has a 47M ohm resistor across the primary. The primary will eventually open; however, the noise can be eliminated by replacing the coil with part No. 13-H-37235.

Edward G. Kertz
Radio Hospital
3808 Roosevelt Road
Kenosha, Wisconsin

Increased Tube Sales Traced To RCA Tester

Philadelphia Dealer Highly Pleased With New Unit

That the new RCA Radio Tube Tester is more than just a highly accurate instrument for testing tubes is amply proven by the experience of Mr. A. Liebscher, of the A-1 Service at 5924 N. Broad Street, Philadelphia, Pa. According to Mr. Liebscher, the RCA tube tester has been a very material factor in increasing the sale of tubes and since installing it his sales have been substantially up, a condition he traces entirely to the purchase of this unit.

A. Liebscher

To quote Mr. Liebscher: "As one of the first to receive a new RCA Tube Tester, I have noticed a very substantial increase in my tube sales and this has been done without the usual sales talk.

"Every customer is personally interested in the true condition of his radio tubes and since the average radio owner can easily understand the action of the RCA Tube Tester, he is entirely convinced that his tube is either bad or good as the case may be.

Customer Sells Himself

"Actually, he sells himself new tubes as I always explain just how the tube tester works and if he cares to, I let him test his own tubes, it is that simple. The RCA monogram is another point that establishes confidence that the test is a correct one.

"The idea of having all tubes listed on a roller within the tube tester solves the problem of lost or soiled data and the arrangement of indicating lines is a good reminder about the all-important filament voltage setting.

"Since owning the new RCA Tube Tester, I am more convinced than ever that it is really smart to modernize your test equipment."

The experience of Mr. Liebscher is being repeated by service engineers throughout the country. Not only does the RCA No. 156 Tube Tester have everything necessary for the correct electrical test of every type of tube, even including the OZ4G and the 913 cathode ray tube, but it also is sufficiently small and light in weight to make it readily portable. This is an important factor with every service engineer who quite often has to carry his tool kit and maybe a chassis as well as a tube tester.

All RCA Parts Distributors now have the RCA Tube Tester in stock and are glad to let you demonstrate it to yourself. It may be purchased outright at its low net price of $37.95 for the counter model and $39.95 for the portable model, or it may be obtained with the purchase of RCA Radio Tubes, as described on page 1, column 3.

Victor Technical Records Provide Test Voltages

Inexpensive Source of Variable Frequency Current

A variable frequency source of alternating current is useful in many service applications. Testing speakers, making overall fidelity curves, checking the cabinet are a few of the many applications of such a source of voltage.

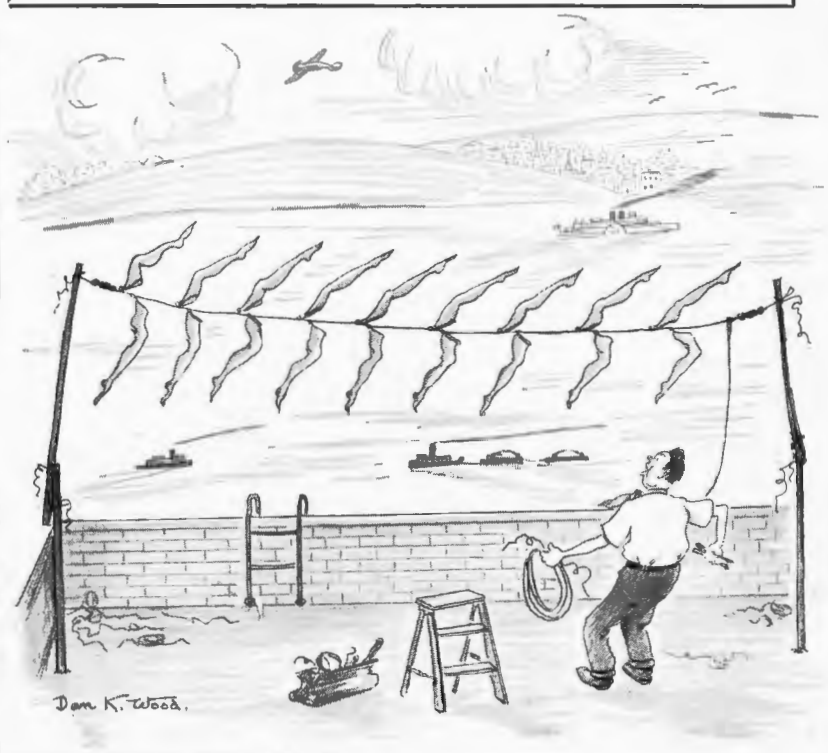
RCA Victor technical purpose records are ideal for producing constant frequencies of any desired value. They are priced at the standard price of 75 cents each for 10-inch records and $1.25 each for 12-inch records. They may be obtained through all RCA Victor Record Distributors.

One of the most popular records of this group is No. 84522, which is a 12-inch disc. This record contains variable frequencies beginning at 10,000 cycles on the outside and ending at 30 cycles on the inside. The record was made with a constant applied voltage to the recorder head. The output attenuates from 800 cycles down to 30 cycles at a constant rate which is the same as that used in commercial recording. Buzzer signals have been put on the record at various frequencies in order to facilitate the use of the record for overall audio curves. These buzzer signals occur at 10,000, 9,000, 8,000, 5,000, 4,000, 2,000, 1,000, 500, 200, 100 and 50 cycles. This record ends at 30 cycles and no buzzer signals occur at this point.

Useful for "Wow" Measurements

On the reverse side of the No. 84522 record, recording has been made that is useful for "wow" measurements on turntables. At 33⅓ r.p.m. the outside band produces a 1,000 cycle note at a constant frequency at .2% instantaneous. The inside band has been recorded at 433 cycles at 33⅓ r.p.m. At 78 r.p.m. the outside band produces a 2,300 cycle note, while the inside band produces a 1,000 cycle note. This record is useful in checking turntables and also as a source of constant frequency for voltage measurements.

Static!



Courtesy *American Legion Magazine*

"No wonder I couldn't get anything but dance music"

Television
FOR THE SERVICE ENGINEER

Television Receivers

E. W. Engstrom and R. S. Holmes

RCA Manufacturing Co., Inc.

(Continued from October Issue)

Receiving Antenna

Certain problems will be encountered in the location and installation of receiving antennas for television. In a residential location remote from the transmitter, the major considerations are to place the antenna at as high an elevation as possible and to locate it as far as convenient from sources of interference. In residential locations, sources of interference are likely to be automobile ignition systems and devices having sparking contacts. In some instances reflections from a prominent building or metal structure may result in multi-path transmission, giving multiple images in the received picture. For the multi-path conditions that may be encountered in residential sections, a simple directive array for the receiving antenna may be helpful.

Antenna locations become critical in urban centers such as New York City. The multi-path transmission

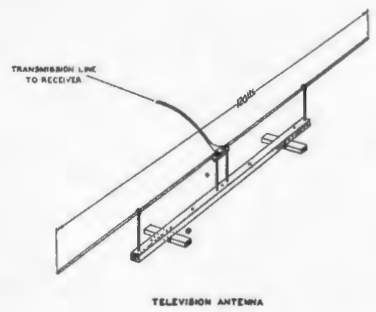


Figure 4

due to reflections from buildings becomes much more complicated. Careful choice of antenna location is essential. A "line of sight" transmission path from the transmitter antenna is desirable. Care must also be taken in positioning the antenna to obtain a location as free as possible from the high electrical interference disturbances from the many sources in an urban center. A prolific source of interference is that from apparatus used for diathermy purposes.

Less difficulty is experienced with multi-path disturbances when using horizontal polarization than when using vertical polarization. A horizontal receiving antenna picks up less noise signal from automobile ignition systems than a vertical antenna. Since other factors are approximately equal for horizontal and vertical polarization, the above advantages for horizontal polarization will make its use desirable for television. Of course, the transmitting and receiving antennas must be for the same polarization.

For simplicity of construction and installation, a simple dipole antenna is most often used for ultra high frequency reception. This type of antenna is satisfactory for television reception and can be used in all except special cases, such as those in which the signal strength is too weak, or those in which a directive array is needed, then a more complicated antenna might be justified.

An important characteristic of the antenna system is its selectivity. It is desirable to be able to use the same antenna for reception of any signal within the television band. An indication of the performance of the simple dipole in this respect is shown by the curve in Figure 5. This is the overall frequency characteristic of a 120 inch dipole antenna as shown in Figure 4 and 100 feet of twisted pair transmission line (the type used in All-wave antennas for sound broadcast reception). The maximum response occurs at about 50 megacycles, where the dipole is resonant, but the response is very broad due to the transmission line loading. The response decreases at the higher frequencies because the dipole is farther from resonance and the transmission line losses are increasing.

The antenna should be mounted so that it has maximum pickup in the direction of the transmitter, that is, dipole antennas should be oriented so that they are at right angles to the signal path from the transmitter. A good transmission line of proper impedance should be used. A good grade of twisted transmission line having a surge impedance in the neighborhood of 100 ohms is satisfactory. Both the antenna and transmission line should be rigidly mounted to prevent swinging in the wind. A swinging antenna system often causes signal variations of large magnitude which the receiver automatic volume controls have difficulty in smoothing out.

Radio Frequency Circuit and Oscillator

In its simplest form, the radio frequency circuit is a means for transferring the radio frequency signals from the input terminals of the receiver to the grid of the first tube. Practically, it must have the highest possible gain, sufficient bandpass to accommodate the desired carriers and their useful sidebands, and sufficient selectivity to prevent large unwanted voltages from arriving at the detector grid and to provide a satisfactory image response ratio.

This simple arrangement could be a single tuned circuit loaded with resistance to make its bandwidth sufficient. However, in practice a coupled circuit arrangement usually proves more satisfactory. The coupled circuit has the advantage of a much greater useful bandwidth for a given selectivity against undesired signals.

Capacitors may be used to tune this bandpass circuit. If the capacitors are variable so that the receiver can be tuned to the several television channels, the maximum capacitance must be large compared to the minimum capacitance plus stray circuit and tube capacitances. With a large capacitor the L/C ratio of the tuned circuit and consequently the circuit impedance becomes low. This in turn results in low overall gain, since the gain is essentially a function of the ratio of the input to output impedance of the system. These considerations point to the desirability of limiting the maximum capacitance of the tuning capacitor and consequently the tuning range of the receiver to as small a value as possible.

Wide Tuning Range

The tuning range in some experimental receivers covers the lower five television channels from about 44 to 90 megacycles. The tuning capacitors then have a capacitance range of approximately 10 to 100 uufd. Typical selectivity curves of such a tuner are shown in Figure 6. A schematic circuit diagram is also shown.

These curves show that the effective pass band of the tuner is nearly constant at all frequencies.

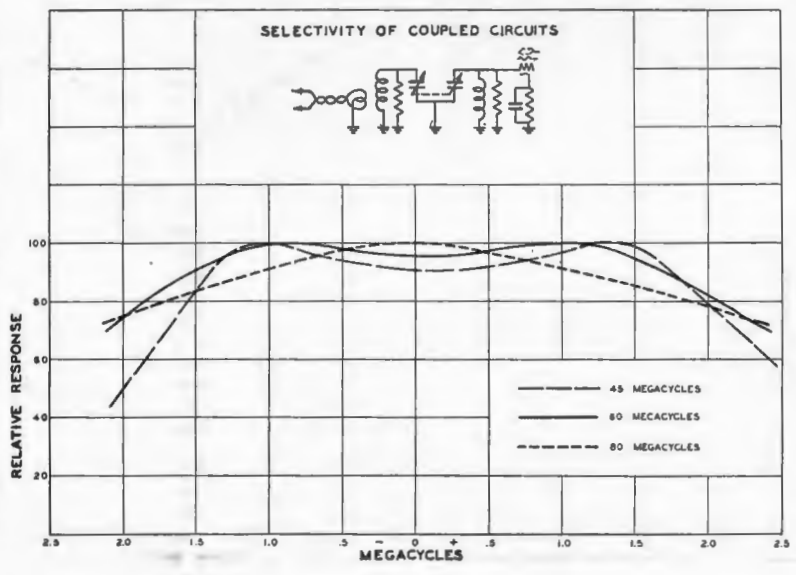


Figure 6

If the tuner is adjusted so that the sound carrier frequency falls at one side of this response characteristic, and the picture carrier at the other side, then both carriers and the upper picture sideband will all be approximately uniformly passed. This uniformity of bandwidth over the tuning range is obtained by using principly conductive coupling between the two circuits. This conductive coupling occurs in the common impedance of the gang capacitor shaft and decreases with increasing frequency, since the current through the trimmer capacitors and circuit distributed capacitances does not flow through the coupling impedance. The resistance loading on the circuits is just sufficient to reduce the double peak due to overcoupling at the low frequency end of the range to a satisfactory degree. With the decreased coupling at the higher frequencies, the response becomes more rounded.

In designing the radio frequency circuit, the characteristics of the antenna and transmission lines must be considered. Both impedance matching and loading effects of the transmission line must be taken into account. Also the loading effect of the grid of the detector tube must be considered; this may be considerable at the high frequencies involved. The curves of Figure 6 were taken with the input properly matched and the detector tube operating.

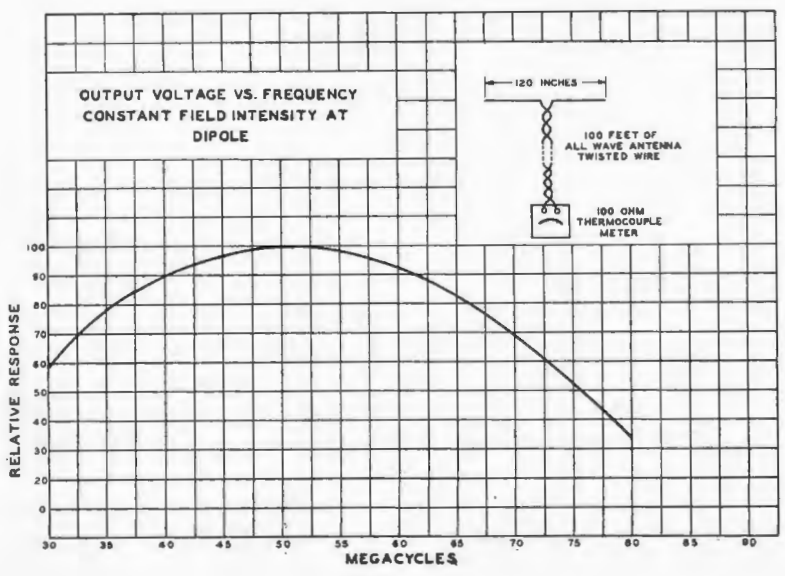


Figure 5

Do You Know That—

—the smallest tube sold by RCA is only the size of an acorn and gives an output of ½ watt?

—most radio tube cathodes are sprayed with 16 coats of electron-emitting material, and that each coat is approximately two ten-thousandths of an inch thick?

—the air pressure within an average radio-tube envelope is only one hundred millionth that of atmospheric pressure at sea level?

—some receiving tubes contain as many parts as a fine 17-jeweled watch?

Announce One K. W. Television Transmitter

Studio and Test Equipment Also Available

Announcement of television transmitting equipment for sale to stations desiring to enter this field of service has just been made by the RCA Manufacturing Company. This apparatus includes studio equipment, transmitters and television test equipment.

The RCA 1 KW television transmitter is the first medium powered television transmitter to be made available by RCA. It is believed that the power of this transmitter is sufficient to enable experimental stations to render a satisfactory service over a reasonable area without too great an initial expense in starting television service. The transmitter conforms fully with the recently established RMA standards and is designed for DC transmission with negative modulation. The video response of the transmitter extends well beyond the range required for present day 441 line pictures with equal horizontal and vertical detail, thus providing for future requirements as to frequency response. The transmitter includes many circuits specially developed by RCA engineers to provide for good quality picture transmission.

Invar Rod Used

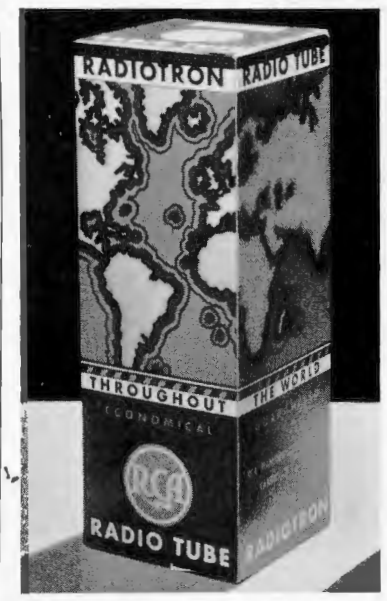
The transmitter employs a long line controlled oscillator using an invar rod (which is unaffected by changes in temperature) to maintain the carrier frequency at a stable value. Because of the relatively high power output from the oscillator, only two buffer amplifier stages are necessary in order to drive the final power amplifier stage. Lines are employed instead of conventional tank circuits in the radio frequency amplifiers. A special modulator circuit is employed with the plates of the modulators directly connected to the grids of the power amplifier tubes in order to provide for carrier control during picture transmission. Rectifier and filter circuits have been specially designed to avoid reaction and to provide an extremely low impedance at all video frequencies. The transmitter includes provision for inserting the DC component during the picture transmission which provides for variable carrier output in accordance with the light and shade tones of the picture.

Requires New Test Equipment

In ordinary broadcasting, for the development of sound apparatus, it is often necessary to check the frequency response over the band of 30 to 10,000 cycles. It is also desirable to check the distortion introduced in amplifiers and for this reason apparatus of this sort has been in general use. However, for television purposes, the video frequency response of circuits extends over the range of thirty cycles to two million cycles at the minimum and because this band is two hundred times as wide as that required for present day broadcasting, very

(*Continued on page 8, column 1*)

Colorful Carton



The new carton for RCA Power and Special Purpose Tubes is an unusually attractive four-colored job. Look for it, the next time you buy tubes for your amateur rig

Television Transmitter

This new RCA One-Kilowatt Television Transmitter has just been announced to broadcasting stations to enable them to initiate a television service at the lowest possible cost

New Television Tubes

Three new Kinescopes and an improved Monoscope—all at attractive prices—have been added to the RCA Television Tube line. Two of the Kinescopes have a white fluorescent screen

White Screen Is Feature of Television Tubes

New 3-inch Kinescope Priced at $15.00 Amateur Net

Three new Kinescopes and an improved Monoscope have been recently announced by all RCA Power Tube Distributors. These tubes have been introduced by RCA to enable the Television experimenter to construct a video receiver at a lower cost than ever. They are:

	Amateur Net
RCA-906-P4 KINESCOPE (Electrostatic - Deflection Type with Medium-Persistence White Phosphor-3" Screen)	$15.00
RCA-1802-P1 KINESCOPE (Electrostatic - Deflection Type with Medium-Persistence Green Phosphor-5" Screen)	23.75
RCA-1802-P4 KINESCOPE (Electrostatic - Deflection Type with Medium-Persistence White Phosphor-5" Screen)	27.50
RCA-1899 MONOSCOPE (Electromagnetic - Deflection Type)	95.00

The 906-P4 is a small Kinescope for the reproduction of television pictures in black and white. Except for its phosphor, it is identical with the RCA-906.

The 1802-P1 and 1802-P4 are medium-size Kinescopes. They have high deflection sensitivity and are identical except for phosphors. Both types are suitable for television reproduction. The 1802-P1 gives a green reproduction, while the 1802-P4 gives a black-and-white reproduction. Because of its high visual efficiency, the 1802-P1 is also admirably suited for oscillographic work. Both types have the new large-wafer magnal 11-pin base. This new base permits the bringing out of 11 leads at the end of the tube and eliminates any need for cap terminals on the bulb. As a result, circuit wiring is simplified, and provision for protection from the high voltages is facilitated.

Monoscope Has Calibrated Resolution Wedges

The 1899 is a special form of cathode-ray tube identified by the name Monoscope. This tube is designed to produce a video signal of a test picture or pattern built into the tube, and is intended for use primarily in testing the performance of television equipment and for demonstrating television principles. Features of the pattern include calibrated resolution wedges, to indicate the amount of detail the associated equipment can resolve, and tests for linearity of scanning, spot defocusing, amplitude, frequency, phase response, and general quality of picture reproduction. The 1899 has the ability to resolve 500-line detail in its pattern and still provide an output having high signal-to-noise ratio. Because of this feature, the 1899 is especially suited for testing the performance of 441-line equipment.

Tube Dealers Reap Profits on "Money-Back"

Promotion Brings In Many New Customers

RCA radio tube dealers throughout the country are benefiting to the extent of many dollars worth of new business as the result of a "money back guarantee" tube promotion plan launched on a nationwide scale several weeks ago, according to L. W. Teegarden, RCA's Manager of Renewal Tube Sales. This plan is described in the October issue of RCA Radio Service News.

Through this plan dealers are provided with special kits containing 500 pieces of promotion material, including 12 moulded plastic cigarette boxes to be given to radio set owners who present their radio tubes for testing at dealers' stores. If the tubes test weak or worn out, dealers are then in a position to sell complete sets of new tubes. At the same time the dealer guarantees that the new tubes will improve the operation of the receiver or the purchase price will be refunded.

"This plan is but one of many RCA has instituted to encourage radio set owners to have the tubes tested frequently and replaced once a year," Mr. Teegarden said. "The 'money back guarantee' has proved to be a powerful incentive to radio set owners to have tubes tested and their sets checked over at periodic intervals. Thus, the set owners have benefited through more efficient operation of their instruments, while dealers and service men have obtained much additional business.

Launched by Individual Dealers

The plan has been launched individually by each dealer, who uses newspaper ads, mailing pieces, handbills, counter cards, window streamers and other material provided in the promotion kit, to reach his prospects. Purchasers of new tubes to replace those testing "bad" are given one week in which to determine whether reception on their radios has been improved by the new tubes. A written guarantee issued by the dealer with the Company's backing assures them of the return of the purchase price if the improvement in reception is not evident.

Service engineers or radio dealers who have not used this fine promotion should immediately get in touch with their RCA Radio Tube Distributor. All distributors will be glad to furnish complete details for delivery of promotional kits.

The Old and The New

Chief Bruce Poolaw of the Kiowa Tribe of Oklahoma, demonstrates the original sound projector to E. T. Jones, RCA Advertising Executive, at the recent annual convention of the Motion Picture Theatre Owners of America in Oklahoma City, Okla.

SHOP NOTES

FROM RCA SERVICE DIVISION

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

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

Low Frequency Alignment—Models 95T5, 96T, 96T1, and 96E

Where additional sensitivity is desired on these single band receivers, it can be obtained by alignment of the tuning condenser at 600 KC and realignment of the trimmer at 1500 KC as follows:

(1) Check alignment of antenna coil with "Tuning Wand" at 600 KC. If brass end gives increase in signal, bend rotor plates of **antenna** section of tuning condenser outward to produce maximum peak output. If magnetite end gives increase in signal, bend plates of **oscillator** section of tuning condenser to obtain maximum output.

(2) Re-align 1500 KC antenna and oscillator trimmers in the usual manner.

Scissors Gear—Models 811-K, 813-K and 816-K

In servicing chassis from any of these instruments or similar types, it is advisable to adjust the reversing switch of the electric tuning mechanism as low as possible to assure that it is positively actuated at the ends of the tuning range. Failure to reverse may result in a damaged "scissors gear" on the tuning condenser shaft. A satisfactory repair of this gear can be made, where necessary, as follows:

(1) Remove compression springs from gears.

(2) Mesh and align both gears accurately with pinion gear.

(3) Solder the movable and fixed gears together at each end.

(4) Re-adjust mesh with the pinion and run through cycle several times to wear-in any irregularities.

(5) Re-adjust reversing switch as suggested; replacing same if questionable. Stock #32167, List Price $7.35 covers the **Tuning Condenser,** less gear assembly for models 811K, 812K, U-109, and U-108. This condenser is being made available in lieu of #14727.

Dial Light Diffusion Screen Models 98K, 99T, 99K, and 910KG

Where warpage of the light diffusion screen tends to obstruct movement of the dial pointer, it is usually possible to bend the pointer outward so that clearance is obtained. It is also possible to reduce the warpage by leaving the set in a reasonably dry place for several days. Should replacement of the screen be necessary, it may be ordered as **Stock #32083**—Dial Color Screen and Frame Assembled, less pointer carriage and rods. This part supersedes Stock #31306.

Blocking or Distortion at High Volume—Model R-89

The amount of reverse amplification provided in this instrument is such that on records having very "heavy" modulation, there may be a tendency to block or produce a choking type of distortion. This condition can be removed by reducing the value of R-9 from 10 megohms to **1 megohm.** This resistor is in the grid return circuit of the 6F5. The 1 megohm may be added in multiple with the 10.

Limitation Push Button Ranges 5-6-7 Tube Receivers, 1939 Line

Occasionally a receiver is found where the lower frequency limit specified on a particular button cannot be reached. The alternative button having the same specified range will cover properly and should be employed to tune the desired station falling at the low frequency limit.

Ballast Tube RMA Numbering

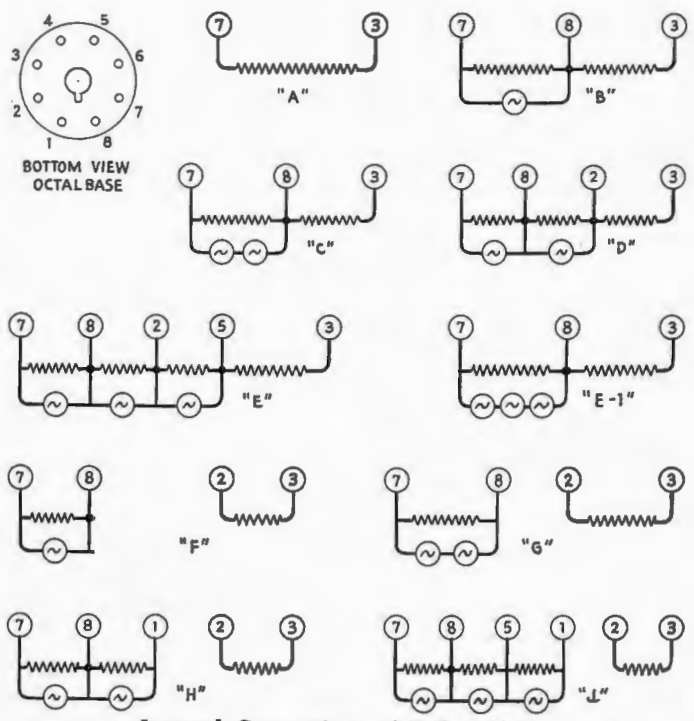
The internal connections and voltage characteristics of ballast tubes used in AC/DC receivers are indicated by the type number and its arrangement. As an example of the RMA coding, note type BK-36-C.

"B" indicates that a ballast section is provided for one or more pilot lamps.

"K" means that the pilot lamp (s) is a 0.150 amp, 6.3 volt type (Mazda 40 or 47).

"36" implies that a 36 volt drop occurs across the entire unit in normal operation with pilot lamps connected. This rating will always be an approximate multitple of 6.3.

"C" or the final letter refers to the terminal arrangement; the present systems being shown below.



Internal Connections of Ballast Tubes

Phonograph Play-Through on Radio —Model U-125

The Model U-125 radio-phono changeover circuit is such that phonograph reproduction will be heard when the push buttons are actuated for "Dial Tuning" or for "Push Button Tuning," only if the turntable is allowed to continue running and the needle is left in place. This condition should be of no importance to the customer, since there will be no occasion to have the mechanical end of the phonograph operating when "radio" is desired; however, if it is desirable to completely void the phono-crosstalk on a particular instrument, it may be done at a slight loss of high frequency response by removing **capacitor C-15** and **resistor R-11** from the circuit. Resistor R-11 has a gray body, red end, and yellow band; and is attached between the volume control tap and a terminal strip located adjacent to the tandem control assembly. Its removal effects the necessary change.

New RCA Victor Farm Radios

The new line of both 1.5-volt and 6-volt tubed RCA Victor Farm Radios are making performance records everywhere. At left is model 96BK6, or 94BK-2; at upper right is model 94BT-1 or model 94BT-61; while at the lower right is model 94BT-2 or 96BT-6

Announce One K. W. Television Transmitter

(Continued from page 6, column 5)

special test equipment is necessary to check the operation of apparatus.

One of the first items which RCA has offered for sale is a special Cathode Ray Oscillograph, Model 136-B, provided with amplifiers extending over the video band. Thus it is possible to examine the wave form of minute impulses and to produce a large image on the cathode ray oscillograph tube for photographic purposes. Many cathode ray oscillographs have been manufactured previously but few, if any, have been able to amplify over such a wide band. Oscillographs of this type have been used by RCA in the Empire State installation and by the Columbia Broadcasting System for experimental television work.

New Sweep Oscillator

Another piece of test equipment is the Video Sweep Oscillator which enables engineers to adjust amplifiers to provide the necessary wide band response. By the use of this equipment and the cathode ray oscillograph, it is possible to observe the frequency response curve of the equipment under test and to make necessary adjustments to produce the desired response. Such equipment saves time over the conventional method of using a beat frequency oscillator and plotting out response curves point by point.

Square Wave Generator

Perhaps the most unique piece of equipment is the RCA Square Wave Generator. Early in the program of RCA's television research, it was discovered that by transmitting a square wave through the apparatus instead of the conventional sine wave, engineers could observe the wave shape of the impulse at the output of the equipment and could tell the deficiencies in the equipment by the difference in the two forms. For example, if the amplifier being tested lacks high frequency response, the wave would not be reproduced with square corners but would be rounded. If phase shift occurs in the amplifier, other distortions would take place which would be readily recognized. The RCA instrument produces square waves having exceedingly straight sides, at several convenient frequencies over the video band. It also possesses the property of making square waves out of sine waves which are fed into it.

Field Intensity Meter

RCA has also developed an ultra high frequency field intensity meter, the first to be offered commercially for checking the range of television stations and other ultra high frequency transmitters. In this way the effectiveness of antennas and the service area of the station can be determined. The instrument also is provided with an attachment for measuring the noise produced by electrical appliances throughout the ultra high frequency band.

Several other RCA test instruments have also been developed including an RF Signal Generator, and an RF and IF Sweep Oscillator.

New Farm Radio Line Announced By RCA Victor

Features Include Excellent Battery Life and Push Buttons

The most complete and outstanding line of battery receivers ever introduced by RCA Victor, providing push-button tuning, handsome modern cabinets, and low initial cost and operating cost, has been announced by Paul C. Richardson, Manager of the Radio and Victrola Division.

There are two complete series of instruments. One comprises four receivers employing the 1½-volt tube for long battery life, while the other consists of three 6-volt radios using a single storage battery.

By employing the new 1½-volt low-drain tube, a receiver which gives 1500 hours of actual operation from one "A" battery and approximately 1000 hours from one set of "B" batteries has been developed. This gives an operating economy never before achieved. Space has been provided in all but one of the 1½-volt instruments for storing the batteries in the table model and console cabinets, another valuable new feature.

Seven Models Included

Included in the 1½-volt series are the following:

Model 94BK-1 — A handsomely styled low-priced console using four RCA Victor low-drain tubes. Improvements in the superheterodyne circuit and the use of magnetite core coils and transformers give this instrument performance capabilities far in excess of ordinary four-tube battery receivers. The cabinet is of selected walnut veneers.

Model 94BT-1 — An attractive table-model receiver employing the same chassis and featuring the same improvements as the 94BK-1. This radio has a modern cabinet of selected walnut veneers, with rolled corners.

Model 94BK-2—This distinctive console model sets a new style in cabinet design for the farm. Of simple but impressive lines, the cabinet has a "roll-over" top and is constructed of selected walnut veneers. This model has push-button electric tuning, with two-band American and foreign reception. Improved circuits and tone control make possible rich tone as well as unusual volume and power at low battery drain. It has 16 tuned circuits and employs four RCA Victor tubes.

Model 94BT-2—This newly designed horizontal table model utilizes the same chassis as the 94BK-2 and operates at the same high performance standard. The cabinet is of unusual beauty and has been designed to contain all the batteries used with the receiver.

Three models are included in the new 6-volt instruments:

Model 96BK-6—This is a 6-tube, 6-volt one battery receiver housed in the same type of cabinet as the 94BK-2. It has two bands for American and foreign reception, electric push-button tuning with single adjustment coils for ease in setting up the stations, and the Electric Magic Voice with bass compensation and tone control. RCA Victor low-drain tubes permit the set to operate with low battery drain using only 1.85 amps. The radio is convertible to 110-volt operation by using the Model CV9 converter.

Model 96BT-6—This six-tube, 6-volt table model is housed in the same type of cabinet as the 94BT-2, and has the same features as the 96BK-6. This receiver is also convertible to 110-volt operation.

Model 94BT61—A four-tube 6-volt table model in the same type of cabinet as the 94BT-1. This unusually sensitive receiver uses a superheterodyne circuit with RCA Victor low-drain tubes for reduced operating cost.

Pretty As a Picture

No matter whose picture Eileen Palmer is taking, the subject couldn't be as pleasant as herself. Eileen, who plays the role of "Red" Lamson in the NBC serial, Girl Alone, heard at 4:45 p.m., Monday through Friday over the NBC Red network, is very blonde, although she plays a redhead on the air

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.

Log Books

New log books are appreciated, both by customers who have purchased within the last year or two and by others who have older sets. We give them to our customers who come in the store. We then ask them for prospects.

They also make a good door opener when calling on a prospect by mentioning new stations in the log book. If their old set fails to get some of the new stations it helps sell a new radio.

C. V. Blood
Good Housekeeping Shop
202 East Ninth
Winfield, Kansas

Pillow Speakers

I have purchased a few of the new pillow speakers and find them very useful in selling radios and service. When showing a customer a new radio, I also show them how they may listen to reception without disturbing anyone at home with this installed pillow speaker. Many of the customers are amazed at this achievement and purchasing the radio becomes easy salesmanship.

I have given my family doctor a small receiver with this pillow speaker. This he lends to his patients who wish to hear programs late at night or early in the morning without disturbing people at home. This receiver has my business card and I have had many service calls from people visiting the sick one. This proves that mouth advertising is beneficial.

Eugene J. Kozysko
2921 W. Division Street
Chicago, Illinois

Record Player Sales

In order to promote sales of RCA Victor Record Players, we set up a recording outfit and let prospective customers make a record of their own voice, which was played back through an RCA Record Player and Victor Radio. The pleasing tone qualities of these units more than pleased them, and the results were amazing.

Ted Matulevich
435 W. 6th Street
Mt. Carmel, Pennsylvania

New Set Sales

In general, women are easily impressed with a comparison between home and radio. Women, above all others, are the first to change the style of their draperies, or to turn in their furniture, for fear of becoming outmoded. It is very effective to point out that a radio set can also become outmoded. This line of attack must be varied with the individual, but it usually helps a great deal to point out certain of the neighbors who have "modernized" their homes by installing "Push Button Control" receivers, etc., etc. The man, or home owner, will also be impressed by pointing out to him how quickly the house itself deteriorates when no effort is made to keep it up and repair the little damages which occur. He cannot help but see that the same applies to his radio receiver.

Ernest J. Vogt
201 Hialeah Drive
Hialeah, Florida

Set Location

I have my radio department in the front of my store. When a customer comes in he is waited on. Then as he goes to leave the store his attention is called to the radios. The radios are kept on so that we can get volume and the station we want immediately. I start to push the buttons and illustrate the new features. Naturally, they become interested and start to ask questions. Then we are given a chance to talk up our radios and offer to install one on trial. We find that this works, because after they are once installed they are generally sold.

O. W. Earl
Dana
Illinois

Line Voltage Check Adds to Accuracy Of RCA Tube Tester

Reads Actual Voltage Until Instant of Test

One of the many important features of the new RCA Radio Tube Tester, now being featured by all RCA Parts Distributors, is the method of reading line voltage tests. While all tube checkers have this feature, very few if any do it with the accuracy of the new RCA No. 156 instrument.

Any service man knows placing the tube in a tube tester loads down the tester transformer causing the filament and plate voltages to drop. Since each tube draws a different filament and plate load from any other one, the amount of the voltages drop will vary. In order to correct for this in the RCA Tube Tester the meter is connected to read the actual test voltage on the secondary of the transformer. This allows one to correct for variations caused by both line and load voltage changes. Since the meter reads "Line Check" except when the tube is actually being checked (depressing the output button) any load or line variations are immediately seen and naturally corrected. This inherently gives greater accuracy without any sacrifice in simplicity of operation.

Uses Special Voltages

In addition to the standard R. M. A. tests, 30 volts r.m.s. with load resistors of 200 ohms for standard tubes, 1000 ohms for battery tubes and 5000 ohms for diodes, the RCA Tube Tester uses special voltages and load resistors for special tests of other type tubes.

To test the 0A4-G, 300 v. r.m.s. and 3000 ohms load are used.

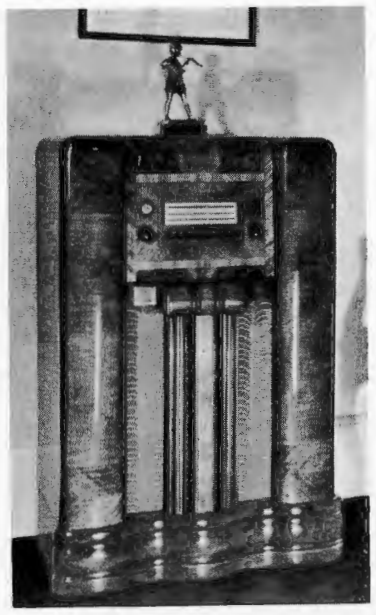
To test the 902 and 913, 30 v. r.m.s. and 10,000 ohms load are used.

To test the targets of Magic Eye tubes, 110 v. r.m.s. and 200 ohms load are used.

To test the gas regulator tubes, D. C. of the proper value is used.

To test ballast tubes for noise, a pair of phones is plugged in the noise jack.

Hot Number!



The new RCA Victor Model 97K, having the low Eastern list price of $75.00, is making a hit with customers everywhere. Note the massive lines of its sturdy cabinet