



RADIO AND TELEVISION

Service News

A PUBLICATION OF THE RCA TUBE DIVISION

JUNE - JULY

1954



Mackoy's Television-Radio Service, Chicago, uses retail display techniques to tell street traffic that it is the local headquarters for radio and television servicing. J. W. Mackoy, service shop owner, directs installation of a new RCA 3 by 4-foot outdoor sign (Form No. 3F160). Note the window valances and the extensive use of display pieces for RCA tubes, kinescopes, and batteries (obtained from Mr. Mackoy's local RCA Distributor).

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RCA TEST EQUIPMENT FOR COLOR TV

Color-Bar Generator, Dot-Bar Generator, Dual-Band 'Scope and Video MultiMarker Added to RCA's Line of Test Equipment

The servicing of color TV receivers presents many new problems. For example, an appreciable loss of gain above 2 or 3 Mc in the overall rf-if response of a color TV receiver may result in poor color sync, poor color "fit" (incorrect registration of color and brightness information on the kinescope), or cross-talk or color contamination between the I and Q channels. These effects will be very evident to the set owner whereas he probably wouldn't notice the resulting softening of sharp vertical edges and the loss of small details due to a similar loss of response in a "black-and-white" receiver.

This example indicates how color TV has placed a new emphasis on existing black-and-white TV service equipment. Alignment equipment, especially, becomes necessary for trouble-shooting as well as alignment of color circuits.

Color TV highlighted the need for two new types of instruments: a color-bar generator, and a dot generator.

A complete color-bar test pattern is required for accurately checking and adjusting the phasing and matrixing circuits of color receivers. However, only a few broadcast stations transmit color test patterns, and such transmissions are usually on an irregular schedule in the early morning hours after sign-off. Consequently, equipment for locally generating a color-bar pattern for servicing purposes, had to be designed and developed.

Faced with this problem, RCA originated and developed the WR-61A Color-Bar Generator which is designed to provide a positive check on the operation and adjustment of color receivers.

RCA WR-61A Color-Bar Generator

The RCA WR-61A Color-Bar Generator is a compact, light-

weight, portable instrument for use in checking the overall operation of color receivers, and for adjusting color phasing and matrixing.

The instrument produces 10 bars of different colors. The color bars are at 30° phase intervals, corresponding to the angles of R-Y, B-Y, I, and Q axes.

The WR-61A provides crystal-controlled picture-carrier, color-subcarrier, and sound-carrier frequencies on channel 3. The color-bar and horizontal sync-pulse frequencies are crystal controlled. The sound carrier (unmodulated) is provided to assure accurate tuning of the receiver (to check sound rejection) and to check for presence of beat interference between the color subcarrier and the sound carrier. A push-button control permits temporary elimination of the sound carrier for quick identification of sound interference.

Luminance signals are provided at the edges of the color bars to check the "fit" or registration of the luminance and chrominance signals. A brightness signal, push-button controlled, produces a horizontal area of increased brightness to check for possible shift of hue in the bright areas, or highlights. The amplitude of the color subcarrier is adjustable by means of a front-panel control which also controls the amplitude of the burst signal, thus providing a check on color lock in the receiver.

Color video signals of either positive or negative polarity are provided for both low-impedance (75 ohms) and high-impedance circuits.

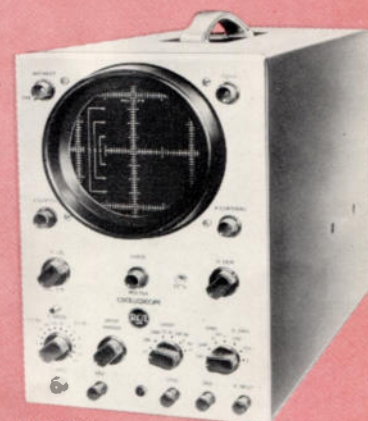
A built-in rectifier circuit, which provides a dc output signal for



WR-36A



WR-61A



WO-78A



WG-295A

measurement on a VoltOhmyst,[®] facilitates measurement and adjustment of the WR-61A sync and subcarrier amplitudes.

RCA WR-36A Dot-Bar Generator

The WR-36A Dot-Bar Generator is designed to provide a pattern of optimum-size rectangular dots for making all convergence adjust-

RADIO AND TELEVISION

RCA *Service News*

A PUBLICATION OF THE RCA TUBE DIVISION

RCA RADIO & TELEVISION SERVICE NEWS is published in the interest of servicemen and service dealers. It is written to assist them in providing better service, and to foster the growth of their business by supplying them with information on the latest trouble-shooting and sales promotion techniques, sales and service aids, together with invaluable data on RCA tubes, batteries, electronic components, and test equipment.

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Joseph Pastor, Jr.
Editor

ments in color receivers. It also provides choice of horizontal bars, vertical bars, or cross-hatch pattern for linearity adjustments in color and black-and-white receivers. The number of bars is adjustable: 8 to 15 horizontal bars; 11 to 13 vertical bars.

The WR-36A provides white dots on a black background. The dots are approximately 3/16 in. by 3/8 in., as viewed on a 15-in. tube.

Both modulated-rf and video output are provided. The rf output is continuously tunable over channels 2 to 6, with adjustable amplitude. Positive or negative video output of approximately 5 volts is provided for feeding into the video amplifiers of color or black-and-white receivers. Choice of internal 60-cps vertical sync, or external sync is provided.

Oscilloscope Requirements for Color

For color receivers, the highest frequency that the oscilloscope must reproduce is the 3.58-Mc color sync burst and the 3.58-Mc oscillator signals in the receiver.

RCA oscilloscopes such as the WO-88A, WO-56A and WO-57B are essentially flat to 500 Kc. While these oscilloscopes are more than satisfactory for the majority of applications in servicing color receivers (including alignment, trouble-shooting in sync and deflection circuits, and trouble-shooting in dynamic-convergence circuits), certain other applications, such as measurement of the 3.58-Mc signals, require a wide-band oscilloscope with flat response to 4.5 Mc.

RCA oscilloscopes have a built-in calibrating voltage circuit and a calibrated vertical step attenuator; the voltage of the input signal can be read directly on the ruled screen in terms of volts per inch.

An extremely important point is commonly overlooked in using an oscilloscope to measure the voltage of input signals. The calibrating voltage is usually a low-frequency sine wave or square wave; therefore, the calibration is accurate only over the range of frequencies for which the response of the oscilloscope is flat. At other frequencies, the calibration is incorrect. Many oscilloscopes are advertised as having "response" to 2 Mc, 4 Mc, or higher. The relative amount of response at the upper frequency

limit is seldom specified, but it is usually quite low. Assume that the response of a particular oscilloscope at 3.58 Mc is only one-tenth of the response at the calibrating frequency. If a 3.58-Mc signal of 1.0 volt actual amplitude is fed into this oscilloscope, the instrument will erroneously indicate that this amplitude is only 0.1 volt.

This error is not limited to the measurement of input voltage but exists also in observing relative amplitudes. For instance, in color television it is often helpful to check the relative amplitudes of the horizontal sync and the 3.58-Mc burst at the second detector. If the response of the oscilloscope is down 10 to 1 at 3.58 Mc, the burst will have only 10% of its true value in comparison with the sync pulses.

Measurement of the voltage of input signals, and observation of the correct relative amplitudes of high- and low-frequency signals, requires an oscilloscope which has flat responses up to the highest frequency involved. This means that for color servicing the response must be flat to 4.5 Mc. Oscilloscopes that have unspecified "response" at 4.5 Mc produce error in measurement of input voltages, and in observation of relative amplitudes of high- and low-frequency signals.

RCA WO-78A

5-In. Dual-Band Oscilloscope

One oscilloscope which incorporates all of the aforementioned requirements is the RCA WO-78A, a 5-inch oscilloscope with dual bandwidth and dual sensitivity as follows:

Wide Band: The frequency response is flat, within -1 db, from 3 cps to 4.5 Mc, with direct sensitivity of 0.1 volt peak-to-peak per inch (0.035 volt rms per inch).

Narrow Band: The frequency response is flat, within -3 db, from 3 cps to 500 Kc, with direct sensitivity of 0.01 volt peak-to-peak per inch (0.0035 volt rms per inch).

The frequency-compensated vertical attenuator has 14 positions, corresponding to the following sensitivities in peak-to-peak volts per inch: **Narrow band**, 0.01, 0.03, 0.1, 0.3, 1.0, 3 and 10. **Wide band**, 0.1, 0.3, 1.0, 3, 10, 30, and 100.

The horizontal amplifier is flat, within -6 db, from 3 cps to 1.0

Mc, with sensitivity of 0.2 volt peak-to-peak per inch (0.07 volt per inch).

The horizontal sweep has four ranges from 10 cps to 100 Kc with positive and negative internal sync, ac-line sync, and external sync.

A low-capacitance probe (9.5 $\mu\mu\text{f}$, 10 megohms) provides low loading of the circuit under test. A four-foot vertical input cable is provided to facilitate working on color chassis in cabinets.

The ease with which accurate voltage measurements can be made with the WO-78A is the result of several design features:

(1) In calibrating the WO-78A, it is not necessary to disconnect the input cable from the circuit under test, or to set the vertical attenuator on a specified range: The "calibrate" pushbutton automatically disconnects the input cable and the attenuator, and applies a fixed internal calibrating voltage to the vertical amplifier. To calibrate, it is necessary only to push the button and set the vertical vernier for two inches of vertical deflection.

(2) The vertical attenuator has numerous small steps which provide generous over-lapping of ranges. The correct pattern height, neither too small nor too large, can be selected by turning the vertical attenuator knob only.

(3) A limiter tube in the sync circuit eliminates any need for adjusting sync amplitude. The pattern stays locked in sync over wide ranges of input voltage and over a considerable range of input frequency. There is no sync amplitude knob on the WO-78A.

(4) The measurement and visual comparison of low- and high-frequency components of composite waveforms are accurate because the WO-78A has flat response from 3 cps to 4.5 Mc.

(5) The removable graph screen is ruled in inches and tenths of inches for ease in measuring signal voltages.

WG-295A Video MultiMarker

When the video-frequency range of a sweep generator is used for checking the response of a video amplifier, the alignment of the chrominance bandpass filter, or the I and Q filters, it is necessary to provide markers to identify specific frequencies on the response curves.

Although it is possible to use a cw oscillator as a marker, this

TEST EQUIPMENT FOR COLOR

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method is not recommended for video frequencies because the harmonics of the oscillator usually create a number of unwanted markers on the response curve, thus making it difficult to identify the desired points. For video-frequency work, it is preferable to use an absorption-type marker, consisting of a tuned circuit loosely coupled to the output of the sweep generator. The tuned circuit absorbs a small amount of the sweep signal, thus producing a dip or notch in the response curve at a point corresponding to the resonant frequency of the tuned circuit.

For convenience, accuracy, and speed in marking the video-response curves of color receivers, RCA has designed the WG-295A Video MultiMarker, which provides five simultaneous absorption-type markers accurately preset at the following frequencies:

- 0.5 Mc (for Q filter)
- 1.5 Mc (for I filter)
- 2.5 Mc (for band-pass filter)
- 3.58 Mc (color subcarrier freq.)
- 4.5 Mc (sound-trap frequency)

Correct Value of High Voltage

In color receivers, at the time of initial installation and on subsequent service calls, it will be necessary to adjust the high voltage to the specified value and also check the high-voltage regulation. *An incorrect value of voltage (or a change in voltage) can affect such things as convergence, focus, or color purity.* It is essential, therefore, to use an accurate voltmeter (such as the RCA Volt-Ohmyst®) and an accurate high-voltage probe (such as the RCA WG-289 or WG-290).*

The high voltage in color receivers may be between 20,000 to 30,000 volts, and the high-voltage supplies are much "huskier" than in black-and-white sets. For personal safety, the technician should select a high-voltage probe that is designed with ample safety factor. RCA high-voltage probes have long, low-loss leakage paths, grounded arc-over protection baffles, anti-corona tips, completely insulated grips, fully shielded cables, and separate ground leads.

*For use with RCA Volt-Ohmysts (WV-65A, WV-75A, WV-77A, WV-87A, WV-95A, WV-97A, 165, 165A) use RCA High-Voltage Probe WG-289, and Multiplier Resistor WG-206.

For 20,000 ohm-per-volt meters that have phone-tip connectors and a 5,000-volt range, use RCA High-Voltage Probe WG-290 and Multiplier Resistor WG-210. This combination provides a 50,000-volt range.

"OPERATION CHECKUP"

A Sales Promotion Campaign Offering Set Owners A Four-Point TV Installation Checkup Plus the Protection of an RCA Lightning Arrester

"OPERATION CHECKUP" is a simple but sure-fire plan which can increase your business and boost your profits during those slow summer months.

Through "Operation Checkup" you can educate the TV set owners in your area on the need for a lightning arrester and thus promote antenna checkup and your sales and service. This new campaign provides you with a *practical* and *personalized* program for merchandising your service on a local basis. Here's the plan . . .

RCA has designed a neat little descriptive folder (Form 3F696) which is actually a convenient self-mailer for you to mail to your customers and prospects. It gives the reasons for and describes the complete four-point installation checkup: (1) Inspection of mast and antenna. (2) Inspection of transmission line. (3) Installation of an RCA lightning arrester. (4) A check of the operation of the TV Receiver.

The self-mailer includes an order-getting business reply card with your imprint. Also, *your own price* for the complete four-point installation checkup will be imprinted according to your order.

To help you get this program across to as many prospects as possible, your RCA Distributor has an eye-catching poster for your store window—it is designed to stop sidewalk traffic and bring you business.

If you didn't get a copy of the flyer which describes "Operation Checkup," ask your RCA Distributor for a copy (Form 3F695). Then carefully read it and the sample mailing piece (Form 3F696), and order a sufficient quantity of these descriptive folders (Form 3F696) for a mailing to the TV set owners in your area; also, order a supply for counter give-away. Don't forget to order a poster (Form 3F697) for your store window.

Finally, stock up on RCA lightning arresters. Be completely ready to cash in on "Operation Checkup" by ordering your supply now.

Don't wait! Get started now so you'll be in a position to let "Operation Checkup" go to work for you at the proper time—just before the summer electrical storms. *This is a timely opportunity for you to merchandise your service . . . don't pass it by!*

Be Safe... Get This Complete
4-POINT CHECKUP
 Including Installation of the
RCA LIGHTNING ARRESTER

- 1 Inspect Mast and Antenna
- 2 Check Transmission Line And Replace Damaged Sections
- 3 Install RCA Lightning Arrester
- 4 Check and Adjust TV Receiver

Ask for our free folder giving full details

ONLY \$

PROTECT YOUR HOME AND YOUR TV INSTALLATION

An eye-catching poster designed to stop sidewalk traffic. This display piece dramatically calls your customers' attention to the need for protection from electrical storms. It also illustrates the complete four-point installation checkup . . . and there's space to fill in your own price.

Reduce Service Time and Increase Your Profits By Using RCA Electronic Components

Do you care about who made that two-dollar, vertical-output transformer you just installed in that TV set that you're about to return to your customer? Sure, the picture looks ok and the "price was right" . . . you're an honest man and passed on some of the saving to the set owner . . . another job completed . . . another satisfied customer.

You're a busy serviceman and you can't stop to think about brand names. If you've had a tough day, you might retort, "The customer can't see the name on that vertical-output transformer — all he cares about is a picture. And besides, he'll squawk if the bill is too high!"

Quality RCA Electronic Components Cost No More

Would such reasoning apply to a replacement power transformer with a list price of \$25? Can you imagine how the set owner would cringe if he saw such an item on his bill! You would probably have some explaining to do! First of all, you would have to justify the price, and then you would have to assure the set owner that there won't be a call-back on this item. In this instance, it would be very comforting to have a well-known and respected brand name such as RCA to help you. The customer may not know exactly what a power transformer is . . . but it "makes sense" to him when you

tell him that you selected an RCA transformer because you want to give him a quality component for his money! (Actually at no extra cost — *quality RCA Electronic Components are competitively priced.*)

"Buyer's Guide" Price Schedule

There are other good reasons why you, the busy TV serviceman, will profit by using RCA Electronic Components. For example, to make it easier for you to select the proper replacement component, RCA has prepared its dealer price schedule in a handy "buyer's guide" format. It is more than just a price schedule of type numbers and suggested prices. The Dealer Price Schedule for RCA Television Components is actually a four-page catalog, complete with descriptive data and photographs.

New Arrangement Speeds Selection of Proper Component

Instead of grouping the components in numerical-alphabetical order, as was done in the past, this price schedule presents each family of components in an individual grouping. Within the individual groupings, the components are arranged in the order of their most important characteristics so that it is now much easier to find the right component for a specific job.

Ask for Form 3F610-R10

Ask your RCA Distributor for a copy of this Dealer Price Schedule for RCA Television Compo-

nents (Form 3F610-R10). In it you will find lower prices, some new items, and all RCA deflecting yokes, linearity and width controls, horizontal-output and high-voltage transformers, blocking-oscillator transformers, focusing coils, vertical-output transformers, power transformers, ion-trap magnets, and a conversion kit.

New Speaker Catalog

Another time-saving service aid is RCA's unique speaker catalog. In this handy guide you will find complete specifications of all RCA speakers — *a complete line for virtually all of your replacement needs.* To facilitate quick selection of the proper speaker, this new speaker catalog presents technical data on all RCA speakers in chart form.

New Speaker Packaging

The end flap of each RCA speaker carton has the speaker



type (PM or field coil), size, type number, magnet weight, voice-coil impedance, and power rating printed on it in large, easy-to-read type. You'll appreciate this feature when you're pressed for time and especially when you're taking inventory of your stock of replacement speakers.

Well-Rounded Line Of Quality Speakers

Whether the replacement speaker is for a home radio, phonograph, auto radio, TV set, or a public address system, you'll find a suitable replacement in RCA's well-rounded line of quality speakers, ranging from a miniature 2 by 3-inch type to several 12-inch types.

Now that high fidelity is making our society more sound conscious, it is quite probable that your cus-

(Continued on Page 7, Column 2)

RCA SPEAKERS Permanent-Magnet Types								
Mounting Dimensions inches	Maximum Depth inches	Type	Magnet Weight oz.	Voice-Coil Impedance @ 400 cps ohms	Resonant Frequency cps	Maximum Power Rating watts	Mounting	Shipping Weight
5" x 7" 	3 1/4"	25751	1.47 (Alnico V)	3.2	120-140	6	Rim or pot	1 lb.-7 oz.
6 1/2" 	2 1/4"	30651	1.47 (Alnico V)	3.2	100-140	4	Rim	1 lb.-10 oz.

A glimpse into RCA's new speaker catalog — the industry's finest (and most useful). Note how concisely each speaker is described. Ask your RCA Distributor for a copy of this handy reference (Form 3F687) which describes a complete line of speakers for virtually all of your replacement needs.

"54 FOR '54" . . . THE PASSWORD FOR YOUR SHARE OF THE \$25 MILLION REPLACEMENT PARTS BUSINESS REPRESENTED BY THE MILLIONS OF RCA VICTOR TV SETS AND PHONOGRAPHS NOW IN USE

Basic Inventory of Only 54 RCA Service Parts Needed for Bulk of Key Replacements for RCA Victor TV Sets and Phonographs Produced Since 1946

"54 for 54" is the theme of the RCA Tube Division's Spring promotion to help service dealers capitalize on a great opportunity for profits in 1954—the unprecedented market potential for genuine RCA Service Parts which has been created by the mass distribution of RCA Victor instruments produced since 1946.

54 Basic Parts

According to RCA inventory-control specialists who conducted nation-wide market surveys, a basic inventory of only 54 RCA Service Parts covers the major replacements for RCA Victor TV sets and phonographs produced since the end of World War II.

The 54 basic parts, selected from more than 20,000 used in these RCA Victor instruments, include: 21 transformers; 18 controls; three deflecting yokes; two selenium rectifiers; one speaker; four crystal cartridges; and five stylii.

Indicative of the sales potential of the 54 basic parts, is one type of vertical-oscillator transformer; it is used in 97 of the 249 different TV models produced by RCA Victor since 1946! The 97 models, in turn, account for more than 2¼-million RCA Victor TV sets now in use.

"Original" Replacements

As a busy TV service dealer or technician you can readily appreciate the advantages of using genuine RCA Service Parts. First of all, there's a growing tendency on the part of manufacturers to educate the public on the advantages of having "exact" or "genuine" replacement parts installed in whatever item they're having serviced. In the auto servicing business, for example, there's a strong preference for "exact" replacements.

Not enough radio and television service technicians are capitalizing on the fact that the average set owner is already "conditioned." He will believe you when you tell him



RCA Victor TV Service Parts Guide (Form No. SP-2001) lists the major replacement Service Parts for all the 249 RCA Victor receivers produced to date.

benefit five ways when he uses genuine RCA Service Parts:

- 1) Direct mechanical fit.
- 2) Exact circuit replacement.
- 3) Less installation time.
- 4) No need for extra parts.
- 5) Original performance assured.

Only genuine RCA Service Parts are tailored to the chassis . . . both mechanically and electrically.

Service Parts Now Available From RCA Distributors

To enable service dealers to readily obtain exact replacements for RCA Victor TV sets and phonographs, RCA has made all RCA Service Parts available directly from RCA Distributors. Most of these distributors have already stocked their shelves with quantities of the basic 54 Service Parts.

To Show to Your Customer

"54 for '54" has still more to offer! Yes, this integrated program even helps solve one of your delicate customer-relations problems—justification of the total charges. The RCA Service Parts List Price Card (also included in your Selling Kit) was prepared for you to show to your customer—the set owner. Printed in two colors on heavy stock, this impressive price card shows only the list prices of all 54 key RCA Service Parts. It's just the thing to have around when justifying your bill to the set owner.

Time-Saving

Parts Guides and Cross References

Another great advantage of using RCA Service Parts is the ease with which you can determine the correct RCA Service Part for any given situation. Each part in an RCA Victor instrument has a number on it; this is RCA's Drawing Number. Also, each of these original parts has an exact replacement which is regularly stocked by RCA. Each of these replacement Service Parts is identified by a stock number which

CLASSIFIED LISTING		JANUARY 31, 1954	
Part No.	List Price	Part No.	List Price
CAPACITORS			
1000	1.00	1000	1.00
1001	1.00	1001	1.00
CONTROLS			
2000	1.00	2000	1.00
SPEAKERS			
3000	1.00	3000	1.00
TUBES			
4000	1.00	4000	1.00
TRANSFORMERS AND COILS			
5000	1.00	5000	1.00
RECTIFIERS			
6000	1.00	6000	1.00

To show your customers! Printed in two colors on heavy stock, this impressive List Price Card shows only the list prices of all 54 key RCA Service Parts.

that the use of exact replacements (RCA Service Parts in RCA Victor receivers, for example) will restore his receiver to its original operating condition.

Advantages to Service Technician
The busy service technician can

should be referred to when ordering. It is a simple matter to get the proper Service Part if you know either of these numbers.

As a matter of fact, RCA's cross references are so complete that it is possible for your RCA Distributor to give you the stock number of a part for which he has only a description such as, "the horizontal output and high-voltage transformer used in RCA Victor TV Model Number 21T165." In this instance, the transformer stock number can be found on page 9 of the new RCA Victor TV Service Parts Guide (a copy of which is included in your RCA Service Parts Selling Kit). This publication lists all 249 RCA Victor TV receivers produced to date.

Available for reference on your RCA Distributor's counter is a copy of the RCA Victor Drawing Number to Stock Number Cross Reference (3F624R-2). This reference lists, in numerical order, the drawing numbers of all RCA Service Parts together with their corresponding stock numbers. This Cross Reference is the place to look if you want the stock number of an RCA Victor part whose Drawing Number is known.

Top-Volume Parts Package

Your RCA Distributor salesman can help you select those RCA Service Parts' numbers which represent the major items servicemen need for repairing RCA Victor TV sets and phonographs.

Ask him for his suggestions on one or more Top-Volume Parts Packages which will be needed for your volume of service work. It's quite probable that he will suggest one or more Top-Volume Parts Packages for phonographs and TV sets similar to the following:

Suggested Top-Volume Parts Packages

RCA Stock No.	Description	Dealer Cost
For TV Receivers		
74144	Vertical blocking oscillator transformer	\$1.80
74951	Horizontal output and high-voltage transformer	3.73
73591	Antenna matching coil	1.20
76452	Selenium rectifier	2.28
71440	Height control	.72
		<u>\$9.73</u>

RCA Service Parts Selling Kit

Along with your Top-Volume Parts Package you will receive, without cost, an RCA Service

REDUCE SERVICE TIME

(Continued from Page 5)

tomer will notice the difference and appreciate the improvement you've made by installing a quality speaker in his TV set or radio.

Each RCA Speaker is a product of top engineering and is fabricated from the best materials by the most advanced mass-production methods.

For all your replacement needs, be sure to use a genuine RCA Speaker, identified by the gold label—symbol of superior speaker performance.

Ask for Form 3F611-R10

If you haven't already received a copy of the Dealer Price Schedule for RCA Speakers (Form 3F611-R10) from your RCA Distributor, be sure and ask him for a copy. Then look it over carefully, especially the suggested dealer prices, and note that *it costs no more to install these quality RCA speakers.*

Parts Selling Kit containing:

RCA Victor TV Service Parts Guide (Form SP-2001)

Television Tuner Parts Guide (Form No. SP-2002)

54 Dealer Price List (3F501)

54 List Price Card (3F502)

The two parts guides will save you precious minutes, and the price lists will come in handy when making estimates and preparing bills.

1954 Inventory Control Guide

When you place an order for your Top-Volume Parts Packages, don't forget to ask your distributor salesman for a copy of the 1954 Inventory Control Guide for RCA Service Parts. It was designed to facilitate the keeping of accurate running records of your sales and inventory of each of the basic 54

Service Parts. *As the local headquarters for genuine replacement parts for RCA Victor instruments, you can't afford to "run out" of any of these important items!*

WR-86A . . . RCA's New UHF Sweep Generator

The RCA WR-86A UHF Sweep Generator is a reliable instrument for testing and servicing ultra-high-frequency television tuners, converters, and receivers.

Oscillator Design

An RCA 6AF4 uhf oscillator triode is employed in a specially designed sweep circuit which provides excellent sweep linearity and a maximum amplitude variation of 0.1 db/Mc. The WR-86A has a wide frequency range continuous from 300 to 950 Mc. Its wide sweep range is continuously adjustable up to 10 per cent of the indicated dial frequency for any frequency up to 750 Mc and up to 75 Mc for frequencies from 750 to 950 Mc.



The oscillator compartment and its associated components are especially designed and sturdily constructed for high stability and reliable performance over extended operating periods. Critical parts are silver plated for maximum electrical efficiency.

WG-296 Balun (50 to 300 Ohms)

The WR-86A is designed for working into 50-ohm unbalanced and 300-ohm balanced circuits. For 50-ohm unbalanced circuits, the output cable is connected directly to the load. The 300-ohm output is obtained from an RCA WG-296 padded balun which is furnished with the WR-86A. When the balun is correctly terminated, the output cable and the balun have a VSWR of better than 1.2 over the 300 to 950 Mc range.

Oscilloscope Requirements

The oscilloscope used in conjunction with the WR-86A should

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Merchandise Your Service on a Local Level to Your Customers and Prospects by Participating In RCA's Dynamic "Tell and Sell" Campaign

RCA's Outstanding Promotion Material Is Designed to Help You "Tell and Sell" for Increased Prestige and Greater Profit

RCA's 16-page booklet, "How to Give Your Television Set the Care it Deserves" is undoubtedly one of the finest aids for educating the TV set owner insofar as what he should know about his set and the qualifications of a competent TV serviceman. This booklet tells your customers the facts about your business. You now have the opportunity to spell out in plain talk your many expenses of operation—most of them hidden to casual inspection—which you necessarily incur to provide quality TV service.

Training and Investment

Now, every potential customer and prospect can come to know you as a respected businessman who has spent years in training

RCA Tube Rack (Form 3F166). This rugged, durable steel-wire rack measures 34 inches high by 22 inches wide, by 8½ inches deep, and provides 780 square inches of shelf space. The shelves may be arranged for various heights to accommodate various tube-type sizes. Another feature of this rack is its flexible-type construction which permits interlocking of two or more racks in either horizontal or vertical combinations.

Although RCA's fabulous "Tell and Sell" contest is over, you can "Tell and Sell" well into the year. With a little booklet entitled, "How to Give Your Television Set the Care It Deserves," which you can give to your customers and prospects, and the latest RCA sales promotion aids . . . the industry's finest . . . you can do a profitable job of making your shop known as the local headquarters for television and radio service.

and who has made a large investment to provide the community with an essential service.

A Good Direct-Mail Piece

You'll want every prospect to receive this booklet from you (there's space on the back cover for your imprint). It is convenient to mail and small enough to carry a quantity with you on home calls. You can obtain a quantity of these booklets (Form 3F168) from your RCA Tube Distributor—order a supply today!

Nationally Advertised Brand Name

Another facet of the fabulous RCA "Tell and Sell" campaign is the plan of assuring your customers and prospects that you use tubes made by RCA—a nationally advertised brand name they know and trust.

The RCA "Tell and Sell" campaign was designed with one thought foremost—to encourage you to merchandise your service on a local level to your own customers and prospects.

Big-League Promotion Material

A new, powerful hard-selling array of RCA promotional material is available from your RCA Distributor. From giant illuminated signs to window-display material, you'll get the kind of backing you need to "Tell and Sell" your customers all the way down the line. You'll find the world's best radio-TV sales promotional aids can be obtained through your RCA Distributor.

Your 1954 RCA Baby Display (Form 3F155). A real traffic-stopper for window or counter, with a strong selling message. This display is a beautiful full-color reproduction of an actual color photograph. The center (done in three dimensions) is 35 by 26 in.; side panels are 19 by 15 in.



A Bonanza Market For Replacement Batteries . . . Yours for the Asking

More than 14½ million battery-operated, portable-radio receivers have been sold in the United States since 1945, and with sales still on the upswing, RCA expects a bonanza market for the sale of replacement batteries.

Batteries, however, carry with them several unique selling problems. But, like many other marketing difficulties, the answers are available, and their application to a dealer's particular market situation will pave the way for a very profitable battery business in 1954.

The Facts

RCA Market Research estimates the existence of 14,535,000 portable radios in the United States this Spring. Surveys indicate that approximately 66 per cent of these portables are inoperative or "half alive" for want of fresh radio batteries. In other words, if you could remind every portable-radio owner in your area that fresh batteries are the heart of good reception, your potential share of the replacement battery business could be tripled!

The Problems

The life expectancy of a battery in a portable radio decreases slight-

ly from day to day, especially if the portable is used frequently. However, the rate of decrease of audio output as the battery voltage falls off is too small to be noticed over a short period of time. Replacement batteries are always purchased after the radio's volume has reached the unsatisfactory level, and, in most cases, not until the portable becomes inoperative because of "dead" batteries.

Many portables are received as gifts. This means that their owners owe no loyalty to the dealer who made the sales. Consequently, when replacement batteries do become a necessity, owners rarely buy them from the dealers who sold the portables.

The local radio-TV service dealer's store should be the source of replacement batteries for all of the portables in the neighborhood. However, most dealers' showrooms are so crammed with appliances or parts that the necessary in-store battery displays are either hidden or entirely absent because of lack of space. For this reason, the customer who is not reminded of his battery requirements will probably buy his batteries at another time . . . and at another place.

The Solution

Portable-radio owners need to be reminded frequently that their sets may need replacement batteries. Advertising, merchandising, and sales-promotion efforts must keep the owners of portable radios constantly informed that you have in stock the batteries they require.

A service call can prove to be an opportune time for selling batteries. Give your serviceman a small stock of popular batteries and furnish him with an order pad so that he can take orders for the batteries he doesn't carry. Instruct him to ask, before the bill for services and parts is tallied and rendered, if the customer needs any batteries.

Plan a local campaign around a free radio-battery check-up offer. Use small, inexpensive ads in your community newspaper to announce that you will gladly test, free of charge, any radio battery to determine its remaining life. You'll be amazed at the store traffic that can be produced by a small investment of this type.

Of course, you'll need a battery

(Continued on Page 10, Column 1)

Perfo-Board Display (3F469). Leading retailers everywhere are demanding more and more perforated board for the merchandise displays. Now, this popular new material has been built into a new display to sell more RCA Batteries for you. Supplied with this display are five special metal fixtures which may be inserted into the beautifully-finished perforated hardwood board in a wide variety of attractive layout arrangements. The display, which carries prominent RCA Battery identification, measures 32 by 32 inches.

RCA Battery Decal (3F467B). Spotlight your stock of RCA Radio Batteries with this newly designed RCA Battery decal. Applied to window, wall, or truck panel, it will compel shopper attention all day long.



Compass Motion Display (3F414). Smartly lithographed in bright colors, it depicts portable radios in use. This display is supplied complete with a battery-operated "motor" and a VS036 battery.



New RCA 222D1 70-Degree Cosine Yoke For Use With Autotransformer Type And Isolated-Secondary Type H-V Transformers

The RCA 222D1 is a deflecting yoke for use with directly-viewed kinescopes having deflection angle of 66 to 70 degrees. This yoke is intended for general replacement use in television receivers using 18.5-mh yokes. The 222D1 will operate efficiently with either autotransformer-type or isolated-secondary-type high-voltage transformers.

The coils of this yoke are especially wound and precision shaped to maintain uniformity of focus during scanning. A ferrite-core structure is used to provide high deflection sensitivity.

Sixteen-inch color-coded leads as well as damping and neutralizing elements are supplied with the 222D1. The damping resistors for the vertical coils are soldered in

place; the resistor-capacitor neutralizing network for the horizontal coils is soldered together but supplied separately as a unit package to facilitate installation according to circuit requirements.

Prototypes of the RCA 222D1 were used as original equipment in many popular model TV sets. In addition, the RCA 222D1 will also replace the seven following types: DY-11A, MDF-73, TY-7, Y11C1, DF-605, Y70F20/43, and Y22.

The suggested list and dealer prices of the 222D1 are only \$10.00 and \$6.00, respectively.

A BONANZA MARKET FOR REPLACEMENT BATTERIES

(Continued from Page 9)

tester . . . and you'll find the RCA WV-37A Radio Battery Tester ideal for the purpose.

The RCA WV-37A contains a built-in load circuit which provides "in-use" testing conditions. The rugged, easy-to-read, 4½-inch meter has two scales which indicate simultaneously the condition of the battery under test and the advisability of replacing it. The top scale indicates the existing percentage of rated battery voltage. The lower scale indicates the battery's condition as "Good,"

"Useable," or "Replace." A voltage-range selector switch on the front panel has nine factory-wired positions to cover the range from 1.5 to 90 volts for testing the popular types of portable-radio batteries.

Display as many sales promotion items as your facilities will permit. Make your counter space, floor areas, and windows attract and sell every minute of the day, And, at night, illuminate your windows and floor displays . . . after-hour reminders can produce additional daytime sales.

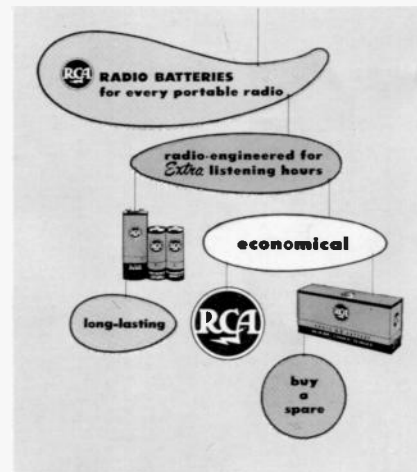
Make full use of RCA's varied array of merchandising aids. Offered at practically no cost, they identify your shop as a battery outlet and, in addition, stimulate battery sales. If you are not taking full advantage of RCA's powerful selling aids, begin to do so now. Ask your RCA Battery Distributor for any or all of the RCA Battery sales promotion items shown in the accompanying illustrations. He has them in stock or he can obtain them quickly.

Remember! When you promote . . . you sell. And when you sell an RCA Battery, the customer gets outstanding performance, as well as a quality product!

Battery Workbench (3F471). This attractive workbench is a natural for your shop or store. It's excellent as a service bench, or it can be decorated for use as a display counter for your portable radios and RCA Batteries. You'll welcome the large service area this bench offers. It has a sturdy five-ply wooden top which has been especially treated to prevent chips and scratches. The working space, measuring 24 by 48 inches, stands 33 inches off the floor. In addition, the bench has a baked-enamel, metal test-equipment shelf measuring 12 by 48 inches and a lower storage shelf of 20 by 48 inches.

Sales Slip Register (3F470). Now you can record each service transaction and product sale in a business-like manner and provide receipts for your customers too. Give one of these registers to each serviceman to carry on his home calls. He can use it to take orders for those RCA Batteries which he does not carry. Measuring 4½ by 7½ inches, this new RCA Portable Sales Slip Register is attractively finished in durable red hammerloid. You'll like the 1,000 continuous-roll RCA Battery Sales Slips which you will receive with your register. Each slip carries a special space for imprinting your store name and address with an RCA Battery Repeat Business Stamp and Pad.

Mobile Display (3F466). Here's an unusual item that will stir up interest and sales. This mobile is an adaptation of a whole new art form which has developed recently. Eight free-flowing RCA Battery panels, with an overall span of 28 inches, move constantly in the slightest air current. Just hang it in your store and watch the buyer reactions it stimulates. Full-color lithography adds zest to this new remarkable new display.



WR-86A UHF SWEEP GENERATOR

(Continued from Page 7)

have high gain and excellent low-frequency response extending flat down to 3 cps, or lower. Poor low-frequency response causes tilting of the response curve, which leads to erroneous alignment. The RCA WO-56A, WO-88A, and WO-78A oscilloscopes are highly recommended for this application.

A blanking circuit is included in the WR-86A to provide a reference base line on an oscilloscope. Horizontal sweep voltage for the oscilloscope can be obtained from front-panel terminals of the WR-86A. A horizontal phase control is provided on the front panel of the WR-86A to permit phasing the sweep.

Ask your RCA Distributor for a copy of the WR-86A flyer. It contains a description of the design features of this sweep generator as well as complete electrical and mechanical specifications. The suggested user price of the WR-86A, complete with rf output cable and the WG-296 50-to-300-ohm padded balun, is \$275.00.

232T1 — A "Universal" Horizontal-Output and High-Voltage Autotransformer For 10 to 21-Inch Sets

The RCA 232T1 is a horizontal-output and high-voltage transformer of the autotransformer type having taps for deflecting-yoke and damper-tube connections. It is a replacement for similar transformers in TV receivers and can be used for converting small-screen receivers to use larger kinescopes.

Utilizing a ferrite core for high efficiency, the 232T1 has a tapped autotransformer winding for use in a wide variety of circuit arrangements, and an isolated-secondary winding to provide voltage pulses for keyed AGC systems. The tapped winding provides the high voltage and has connections to accommodate "B" supplies of 200 to 375 volts and to match any commonly-used driver tube to yokes having horizontal-coil inductances from 8 to 30 millihenries.

Wide flexibility of this transformer makes it "universally" suitable for use in any 50° to 70° circuit and for supply high volt-

ages up to 16 Kv.

The 232T1 employs a universal-type mounting bracket with slots and holes to facilitate its installation on most television receiver chassis. The universal bracket permits the transformer to be mounted in either a vertical or a horizontal position.

An eight-page technical bulletin which is packed with each RCA 232T1 Horizontal-Output and High-Voltage Transformer illustrates eight typical circuits for this transformer (look for the new RCA 232T1 listing in Howard Sams Photofacts).

It's a good idea to keep a couple of these universal transformers in stock at all times—you lose time and money every time you try to adapt a less versatile transformer to fit (mechanically and electrically) a given set.

Your cost for this sure-to-be-needed replacement transformer is \$6.30; the list price is \$10.50.

TEST EQUIPMENT CATALOG

Before investing in any new pieces of test equipment, see your RCA Distributor and obtain your copy of this new RCA Test Equipment Catalog (Form 2F786). In it you will find a complete description of RCA's entire line of instruments which includes oscilloscopes, audio and rf signal generators, sweep and marker generators, VoltOhmysts,® a radio-battery tester, an ultra-sensitive dc microammeter, and special-purpose probes as well as several other accessory items . . . a complete line of test equipment that is preferred by professionals!

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Back by popular demand! Because of the large number of requests for the WO-56A 7-Inch Oscilloscope, this instrument again appears in RCA's Test Equipment

Catalog.

The WO-56A is the last word in scopes designed expressly for servicing black-and-white TV sets. It is also an excellent scope for most color servicing applications. Frequency response of the direct-coupled vertical amplifier is flat from 0 to 500 Kc within -2 db, and within -6 db at 1 c. With the G-216B Low-Capacitance Probe supplied with this 'scope, the input resistance is 10 megohms shunted by 9.5 μ .

Two special "TV" positions of the sweep-selector switch, marked "TV/V" and "TV/H," provide pre-set positions for locking the sweep in at 30 and 7875 cps. These pre-set sweep frequencies aid in speeding up signal tracing and troubleshooting in sync, video, horizontal and vertical-deflection circuits.

For full details on the many other features of this fine 'scope, see your RCA Distributor.

VOLUME VIII OF RCA VICTOR SERVICE DATA

An eighth bound volume of the well-known RCA Victor Service Data series is now available. Designed as a permanent reference volume, this hard-cover book contains complete authoritative servicing information including the latest production changes on all 1952 RCA Victor phonographs, radios, and television sets.

The contents include servicing information such as schematic and wiring diagrams, electrical and mechanical specifications, alignment procedures, complete Service Parts lists, chassis layouts, voltage charts, and valuable trouble-shooting suggestions.

Volume VIII contains 314 pages; it is an addition to the seven previously issue bound volumes which provide service data on RCA Victor instruments from 1923 through 1951. The price of Volume VIII is \$5.00.

All of the bound volumes are available from your RCA Distributor or from Commercial Engineering, Tube Division, RCA, Harrison, N. J.

MODIFICATION OF WR-59B AND EARLY WR-59C MODELS EXTENDS SWEEP RANGE TO 50 KC

Current production of the RCA WR-59C Sweep Generator covers the video range down to 50 Kc. Earlier WR-59C and WR-59B instruments can be modified to extend their low-frequency limit (300 Kc) to 50 Kc. Complete instructions for this modification will be given in the next issue of RADIO AND TELEVISION SERVICE NEWS.

Get ready for **COLOR TV**



Now at no extra cost to you
the famous **RCA INSTITUTES**

HOME STUDY COURSE IN COLOR TV

with your purchase of RCA Tubes



LOOK WHAT YOU GET...

GROUP I—COLOR TV THEORY

1. Introduction to Color Television
2. Principles of Two-Phase Modulation and Colorimetry
3. Principles of Color TV Receivers

GROUP II—COLOR TV RECEIVERS

4. Color Kinescopes
5. The Color Television System
6. Color TV Receiver Circuits

GROUP III—COLOR TV SERVICING

7. Set-up and Adjustment of Color TV Receivers
8. Servicing and Alignment of Color TV Receivers
9. Test Equipment for Color TV Servicing

Here is an outstanding offer which can put your service business out front in your neighborhood. Here is an opportunity to learn more about color TV . . . quickly . . . thoroughly from the famous RCA Institutes. When you buy RCA Tubes, you can earn a complete, 9-step Home Study Course on Color TV at no extra cost. This is your chance to improve your outlook for COLOR TV profits *now* before this big business gets into full swing.

Remember—the RCA Institutes Home Study

Course in Color Television is an *advanced course*, written expressly for experienced television technicians who want to be prepared for the specialized business of Color TV servicing. Remember also that RCA pioneered and developed compatible Color Television.

Act today on this progressive offer. Ask your RCA Distributor Salesman for complete details as to how you can earn the RCA Institutes Color TV Home Study Course **FREE** with your purchases of RCA Tubes.

ACT NOW!— Offer expires November 15, 1954.



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