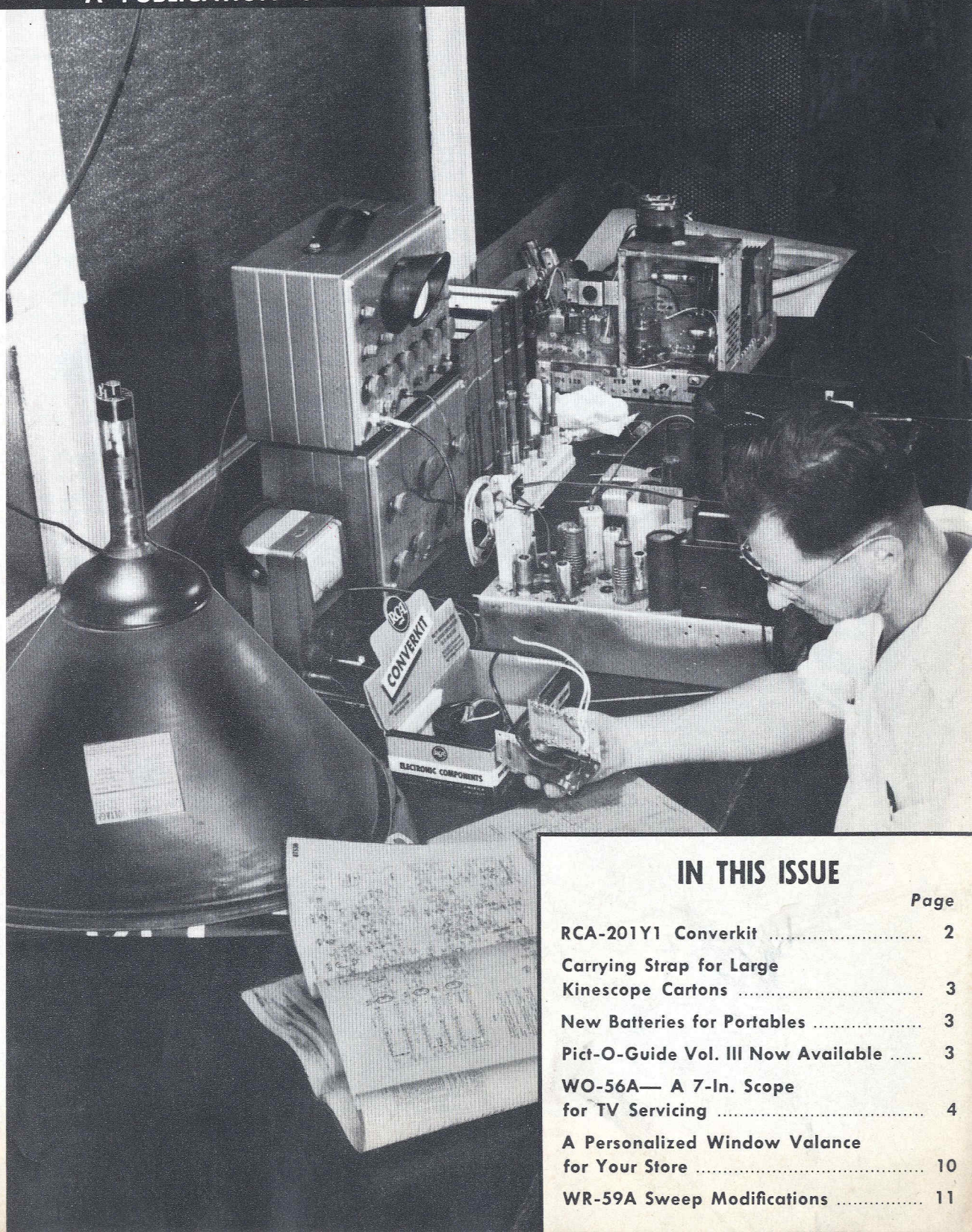
RADIO AND TELEVISION

Service News

A PUBLICATION OF THE RCA TUBE DEPARTMENT



AUG.– SEPT.
1952

Vol. 17, No. 3

IN THIS ISSUE

GOOD NEWS!
Announcing the New RCA
CONVERKIT for.....

- Simplified Replacements
- Easier Conversions
- Minimum Stock Inventory

The RCA-201Y1 "Converkit" consists of a "universal" horizontal-deflection-output and HV transformer and a ferrite-core deflecting yoke for converting small-screen television receivers to use kinescopes up to 21 inches in size.

Heart of the "Converkit" is the RCA-231T1, a "universal" horizontal-deflection-output and high-voltage transformer, which is designed both for replacement use in TV receivers utilizing transformers which have isolated secondary windings, and for general conversion service. The RCA-231T1 covers a high-voltage range of 10 to 15 Kv.

The "anastigmatic" deflecting yoke (RCA-211D2) included in the "Converkit" features a ferrite core for high deflection sensitivity, distributed windings of a modified-cosine design for sharp corner focus, and negligible pattern distortion. It is supplied complete with 12-inch leads, two vertical damping resistors, and a neutralizing network for the horizontal coils.

Of special interest to service dealers and technicians is the transformer's universal-type bracket which permits mounting the 231T1 on the chassis of virtually all types and makes of television receivers. The bracket incorporates numerous combinations of mounting slots and holes which provide for simple to complicated mountings in either vertical or horizontal positions.

Secondary-winding taps are provided on the transformer to facilitate flexibility in securing an accurate match between the driver tube and any yoke having a horizontal-coil inductance from 8 to 30 millihenries. This multi-tap arrangement permits the use of the transformer with a wide range of kinescopes having horizontal-deflection angles from 50° to 66°.

The transformer's primary winding is tapped for "B"-supply voltages from 250 to 350 volts which permits its use with all standard driver tubes. With the transformer's unique electrical construction, the damper tube is always connected across the entire secondary winding, thus providing maximum damping.

Cover Photo

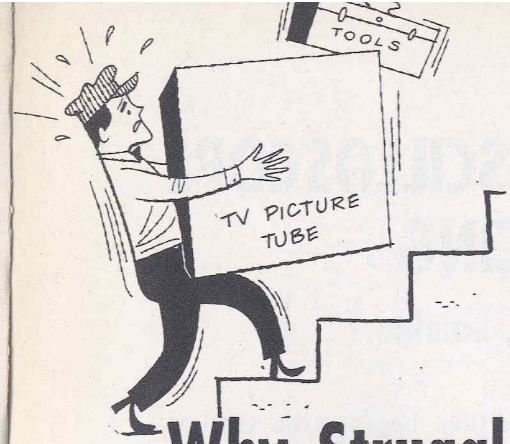
The RCA-231T1 being used in a typical conversion job. Don't miss the next issue of RADIO AND TELEVISION SERVICE NEWS—it will contain an informative article showing how to use the RCA-231T1 as a replacement in television receivers.

RADIO AND TELEVISION
Service News
A PUBLICATION OF THE RCA TUBE DEPARTMENT

RCA Radio & Television Service News is published in the interest of servicemen and service dealers. It is written to assist the serviceman in providing better service, and to foster the growth of his business by supplying him 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.

Radio & Television Service News is a bi-monthly publication of the RCA Tube Dept., Harrison, N. J.

Joseph Pastor, Jr.
Editor



USE AN RCA CARRYING STRAP FOR EASY HANDLING OF LARGE KINESCOPE CARTONS

Why Struggle?

Remember the last time you struggled up a flight of stairs with a bulky kinescope carton? Servicemen will welcome RCA's Carrying Strap—a simple gadget to facilitate the handling of cumbersome cartons. With this carrying strap, you can easily and safely carry a cartoned kinescope with one hand, leaving the other hand free to carry your tool box or "Treasure Chest"—it saves those tiresome trips back to the service truck.

The practical 120-inch RCA Carrying Strap fits any carton up to the 24-inch kinescope size. It is constructed of extra-strong webbing and is fitted with a "grip-molded" plastic handle which fits snugly in the hand. This bright-red strap carries a white-imprinted reminder to your customers, "RCA Tubes for Better Pictures."

Ask your RCA Distributor about the carrying strap the next time you place your order for RCA tubes; order a carrying strap for each TV serviceman in your shop.

New Alkaline-Type "B" Battery and New "A" Battery Provide Longer Playing Time in New "Personal" Portables

Two new RCA radio batteries are expected to play an important part in the continuing trend toward more compact, and more economical "personal"-type portable radios.

The new "B" battery, the RCA VS216, is a 67½-volt battery of the alkaline dry-cell type. It is the first radio battery to employ alkaline cells formerly restricted to wet-type, non-portable batteries. *The VS216 is 22 per cent smaller than ordinary 67½-volt batteries.* It plays newly designed "personal"-type portable radios up to twice as long as ordinary 67½-volt batteries.

The new companion RCA VS236 1½-volt "A" battery (size G) provides up to five times the life of ordinary size D "A" batteries.

Both the VS216 and the VS236 are encased in steel to prevent swelling and wedging in the radio, a feature of interest to every owner of a "personal"-type portable.

Two VS236 batteries connected in parallel in a "personal" radio balance the life of one VS216, and make possible the design of a "personal" radio which can play up to 10 times longer, without battery change, than previous models using one 67½-volt "B" battery and one 1½-volt "A" battery of the ordinary type.

To obtain comparable performance from previous designs of "personal" portable radios, two 67½-volt "B" batteries and 10 to 12 1½-volt "A" batteries are required.

The new RCA battery complement offers savings in battery cost of as much as 25 per cent.

NEW PUBLICATIONS HELP SOLVE YOUR DIFFICULT TROUBLESHOOTING PROBLEMS

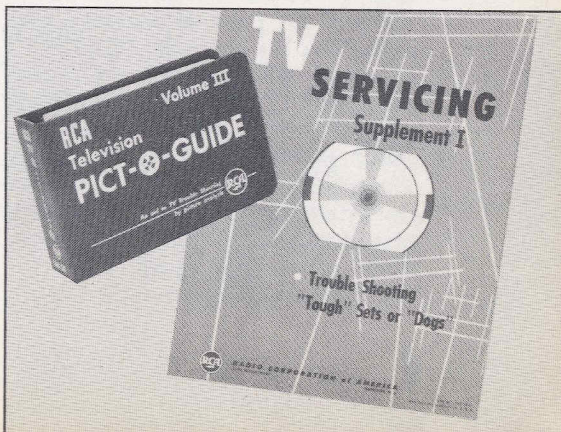
Your RCA Distributor now has in stock the new PICT-O-GUIDE Volume III and a supplement to the popular TV SERVICING. Both of these invaluable publications were written by John R. Meagher, noted author of the popular series, "Television Service" which has long been featured in RADIO AND TELEVISION SERVICE NEWS.

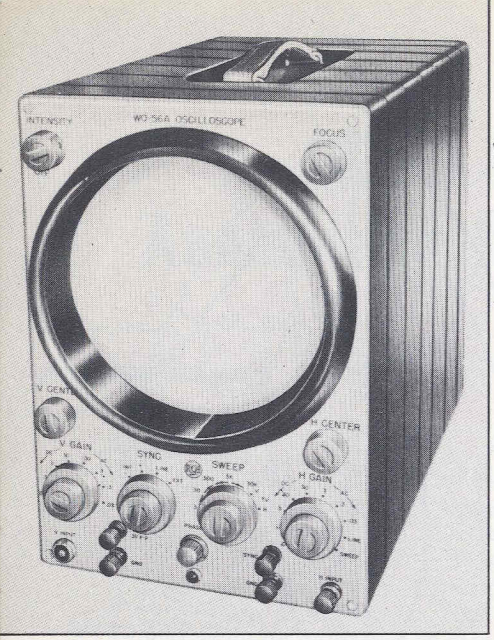
Pict-O-Guide III contains more than 200 pages (including nearly 100 photographs) of detailed service information designed to simplify troubleshooting by picture analysis.

TV Servicing Supplement I ("Trouble Shooting 'Tough' Sets or 'Dogs' ") will enable you to save many hours of servicing time.

Both of these helpful publications are offered, for a limited time, to television service dealers and technicians as a bonus with each order for 75 RCA receiving tubes or three RCA kinescopes. Those servicemen who haven't obtained Pict-O-Guide Volumes I and II can obtain them as alternatives to Volume III, during the period of this promotion.

Your bookshelf is incomplete without these latest RCA publications. Pict-O-Guide Volume III is chock-full of valuable service tips on TV service problems such as ghosts, hum, and TVI. Circuits covered include agc, horizontal deflection, power supply, rf-if, sync, video, vertical deflection, and vertical oscillator. The TV Servicing Supplement tells how to trouble-shoot "tough" sets or "dogs".





WO-56A—A 7-INCH OSCILLOSCOPE FOR TV SERVICING

By M. J. Ackerman and R. D. Scheldorf*

The RCA WO-56A Oscilloscope is designed to meet the strictest requirements of TV servicing. This designed-for-television oscilloscope employs direct-coupled, push-pull vertical and horizontal deflection amplifiers. The frequency response of these amplifiers is essentially flat from zero cycles (dc) to 1 megacycle.

Another feature of the WO-56A is an input-impedance of approximately one megohm shunted by only 30$\mu\mu$f for the vertical and horizontal amplifiers. A 7-inch, cathode-ray tube screen provides large, easy-to-read traces of waveforms, pulses, and response curves. Although designed primarily to do a top-notch job on the TV service bench, the quality performance of the WO-56A, makes it useful for many general laboratory applications in which complex waveshapes are to be observed. A block diagram of this oscilloscope is shown in *Fig. 1*.

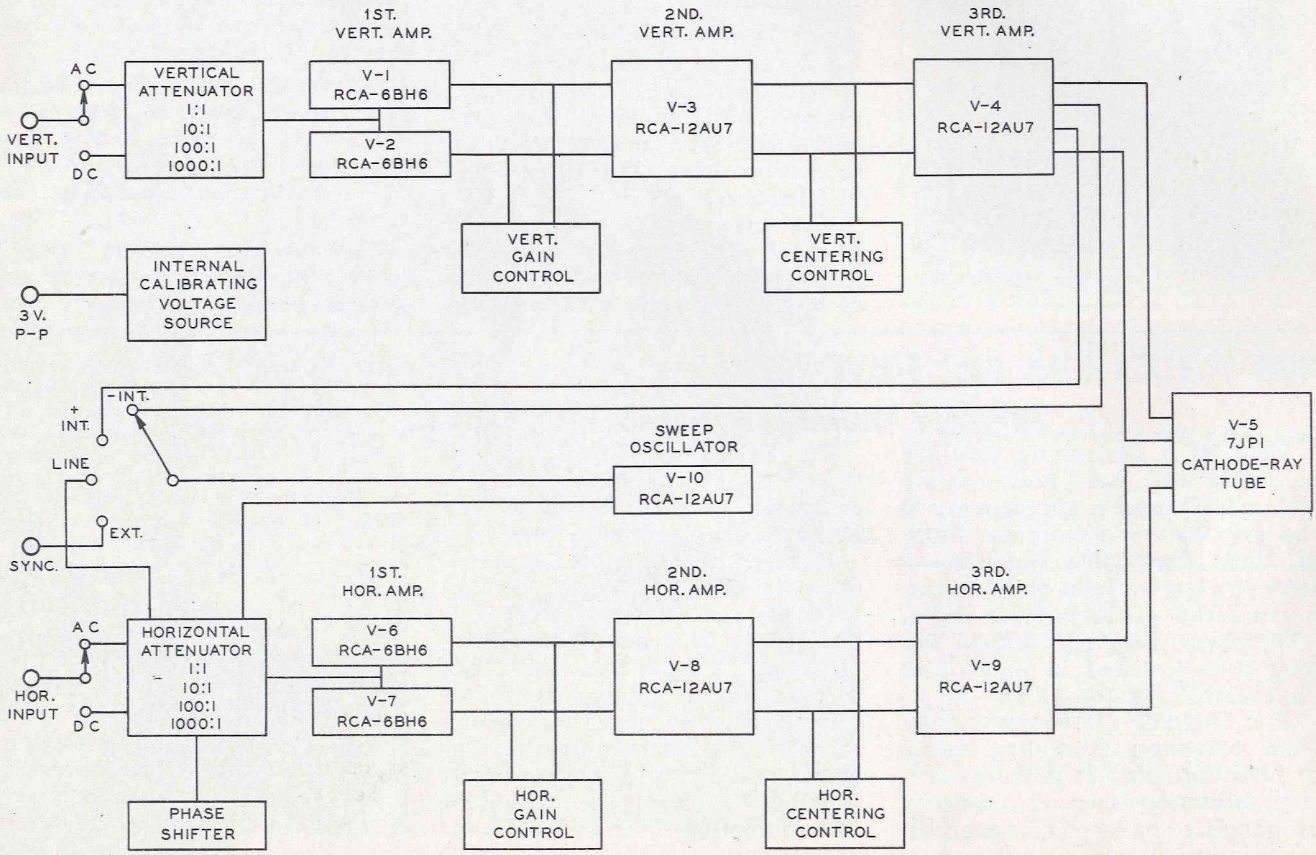
Direct-Coupled, Push-Pull Amplifiers

Versatility of application and good performance are the chief advantages for using direct-coupled circuits in the vertical and horizontal amplifiers of the WO-56A. These amplifiers provide excellent low-frequency response down to zero cycles (dc), an essential feature for undistorted 60-cycle square-wave reproduction. In addition, because the vertical and horizontal amplifiers have the same frequency and gain characteristics, phase shift in networks and amplifiers can be readily observed and measured with accuracy.

The use of push-pull amplifiers in the WO-56A aids in obtaining electrical symmetry which facilitates the neutralizing and balancing of the circuits. Push-pull amplifiers also reduce astigmatic distortion, thereby providing a sharper image over the entire useful area of the cathode-ray tube screen. Residual hum, which may plague high-gain amplifiers, is reduced in the push-pull stages because the hum has the same phase in both amplifier sections,

* M. J. Ackerman, Manager, and R. D. Scheldorf, Design Engineer—Test and Measuring Equipment Development Group, Tube Department, Camden, N. J.

Fig. 1. Block diagram of the circuit of the WO-56A 7-inch oscilloscope.



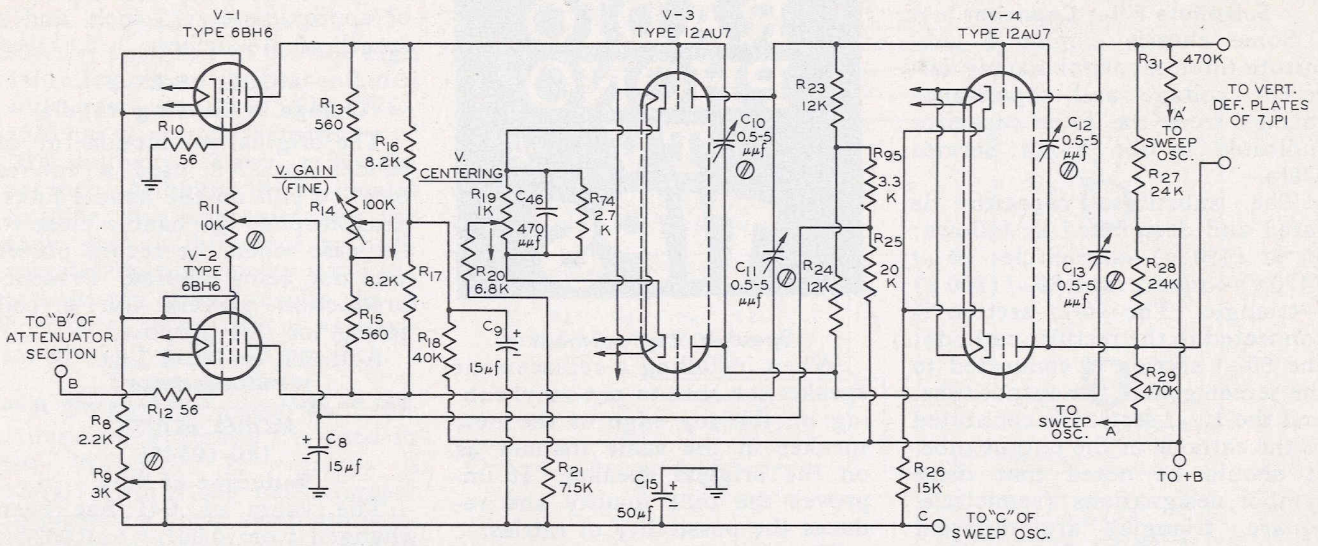


Fig. 2. Schematic diagram of the vertical-amplifier section.

and is cancelled in the output circuit.

Because direct coupling between stages is employed in the WO-56A, large coupling capacitors are not required for good low-frequency response. A schematic diagram of the vertical-amplifier section is shown in *Fig. 2*.

Balanced Input Stages.

Each amplifier section employs three stages; the input stage of each section employs two 6BH6 pentodes. These 6BH6's are provided with a variable screen-voltage supply so that the amplifiers can be balanced. This balance maintains the position of the signal trace when the setting of the FINE GAIN control is changed.

The total plate-to-plate load of the vertical-input stage includes the "V GAIN" (vernier) control, R_{14}, and resistors R_{13} and R_{15}, as shown in *Fig. 2*. Each of the two following amplifier stages uses a 12AU7 twin triode. Because this tube has a relatively low plate resistance, a high plate-load resistance may be used with practically no loss of frequency response. The combination of two 12AU7's provides high gain because the 12,000-ohm plate resistors in the second amplifier stage and the 24,000-ohm plate resistors in the third amplifier stage permit the development of considerable voltage changes. The 12AU7 output stage produces enough voltage to drive the 7JP1 cathode-ray tube to three times full deflection.

Response Characteristics. The vertical and horizontal amplifiers have a frequency response which is flat to within —2 db from 0 to 500 kilocycles, and to within —6 db from 0 to 1 megacycle. This response is more than adequate for TV service requirements; for example, a 100-kilocycle square wave can be reproduced with negligible tilt and overshoot. Because of its flat frequency response, the WO-56A permits faithful reproduction of sync pulses, waveshapes of vertical- and horizontal-deflection voltages, and other complex waveforms. The combination of load resistance and distributed capacitance is such that the downward slope of the response curve at the high-frequency end is gradual; the curve tapers off without peaking effects to beyond three megacycles. Overshoot and ringing, which are common to amplifiers employing peaking coils to extend their high-frequency range, are not a problem in this scope.

Attenuators. Maximum convenience has been provided by keeping the front-panel controls of the WO-56A to a minimum through the use of dual shafts for switches and potentiometers as is common in modern television receivers. The vertical and horizontal gain selectors and their vernier adjustments, for example, are combined in two controls. The outer knob of each control selects one of four frequency-compensated step attenuators for dc input when turned in a counter-clockwise position, as shown in *Fig. 3*. When this control is switched to the "AC" positions, a blocking capacitor is connected in series with the input terminal and the same frequency-compensated attenuator is employed. These step controls provide a maximum voltage attenuation of 1,000 to 1, and operate in the same manner as the attenuators in multirange vacuum-tube voltmeters.

The center knob of each of the concentric gain controls operates a potentiometer (R_{14}, for example, shown in *Fig. 2*, is the vertical-amplifier, vernier gain control). These potentiometers are designed to vary the signal level over a range of approximately 10 to 1. Two 560-ohm resistors, in series with each potentiometer, form an adjustable shunt load across the plates of the push-pull input stages.

Centering Control. The "V CENTER" control consists of a 1,000-ohm potentiometer (shown as R_{19} in *Fig. 2*) connected between the cathodes of the first 12AU7 amplifier. Because cathode current flows through the adjustable arm of R_{19} and its associated resistors, the potentiometer permits a change of cathode bias for either section of the tube which, in turn, unbalances the 12AU7 output stage, and moves the beam in the cathode-ray tube. A similar arrangement is used for the "H CENTER" control. However, a potentiometer of 2,000 ohms is used for the H CENTER control in order to obtain a wider variation of bias. The resulting trace expansion range is approximately three times the screen diameter.

Sensitivity. The vertical and horizontal amplifiers in the WO-

(Continued on Page 7, Col. 1)

MODEL X-711 (RC-1070A)
Substitute Filter Capacitor

Some chassis employ a substitute filter capacitor having different voltage and capacitance ratings from the filter capacitor indicated in the X-711 Service Data.

The substitute capacitor is rated and designated as follows: 40 μf (450 v)—semicircle; 10 μf (450 v)—square; and 80 μf (200 v)—triangle. The 40-μf section is connected to the rectifier cathode; the 80-μf section is connected to the screen grid of the output tube, and the 10-μf section is connected to the cathode of the output tube. It should be noted that these symbol designations (semicircle, square, triangle) are different from those shown for the filter capacitors in the X-711 Service Data.

RADIO PHONO TV * TIPS

Speaker Replacement

When installing a replacement speaker, be sure to put vinyl tubing on the top edge of the new speaker in the same manner as on the original speaker. It improves the tone quality and reduces the possibility of rattles.

This tubing was omitted on early production instruments; it should have an outside diameter of approximately ¼ inch, and a length of 3½ inches.

*Courtesy RCA Service Co.

MODEL 45-EY-3
Change in Carrying Handle

The original production run of Model 45-EY-3 used a rubber band to pull on the handle links, thus keeping the handle close to the case when the record player was not being carried. Present-production players use a coil spring for this purpose.

Addition to Parts List:

MISCELLANEOUS

Stock No. 76674 . . . . Spring-handle return spring.

MODEL 6QU3Y
(RC-1054F)
Reduction of Hum

The value of C41 has been changed from 0.001μf to 0.0022μf to minimize hum. In addition, the frame of the selector switch S2-1

(Continued on Page 8, Col. 1)

WO-56A OSCILLOSCOPE

(Continued from Page 5)

56A are designed to provide high deflection sensitivity combined with good stability. The WO-56A has a vertical sensitivity of 10.6 millivolts (rms), or better, per inch. Although the horizontal amplifier has approximately the same gain, a difference in horizontal-deflection sensitivity of the cathode-ray tube results in a horizontal sensitivity of approximately 21.0 millivolts per inch.

Sweep Oscillator

A Potter-type sweep oscillator (time-base generator) is used in the WO-56A. It employs a 12AU7 twin-triode multivibrator to provide a linear sawtooth voltage having a frequency range of 3 cycles to 30 kilocycles. This type of oscillator has excellent stability at high frequencies, and extremely fast retrace. Fast retrace is an important feature for reducing distortion of the leading edges of waveforms, particularly on those having steep fronts. The 12AU7 generates a sawtooth voltage by regenerative amplifier action, with a 1,200-ohm common cathode resistor (R_{79} in *Fig. 4*) providing a feedback path.

The "SWEEP" selector is also a dual control combining the functions of coarse- and vernier-frequency controls. The center knob provides fine control of the sweep frequency by means of dual potentiometers R_{81} and R_{84}. These potentiometers are designed to track closely in order to avoid horizontal shift of the image on the cathode-ray tube. Two special "TV" positions of the "SWEEP" selector, marked "V" and "H," provide preset positions for locking the sweep in at 30 and 7875 cycles. These preset sweep frequencies aid in speeding up signal tracing and trouble shooting in sync, video, horizontal-deflection and vertical-deflection circuits.

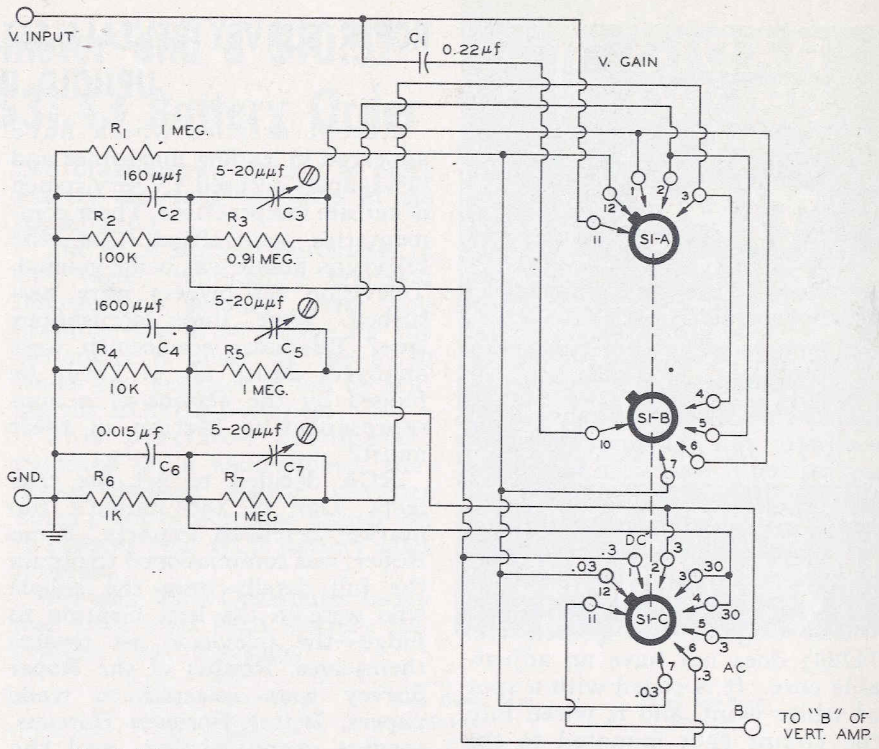
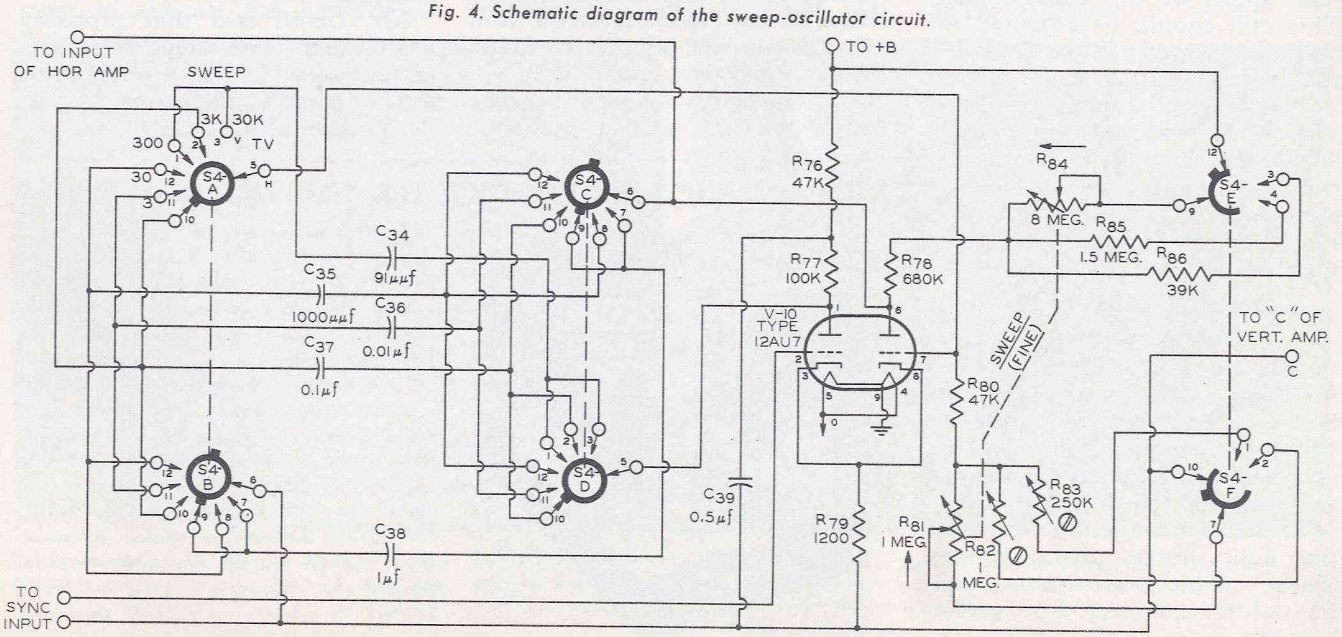


Fig. 3. Schematic diagram of the frequency-compensated, step-attenuator network.

Synchronizing. The dual SYNC control consists of a selector switch and a potentiometer for correctly synchronizing the waveshape to be observed. When the sync selector switch is set to the "INT—" position, sync voltage is obtained from one plate of the vertical-amplifier output stage, and the sweep flyback starts while the input signal is going in the negative direction. With this control set to the "INT+" position, the synchronizing voltage is obtained from the other plate so that the flyback starts when the input signal is going in

(Continued on Page 11, Col. 1)

Fig. 4. Schematic diagram of the sweep-oscillator circuit.



RADIO PHONO TV * TIPS

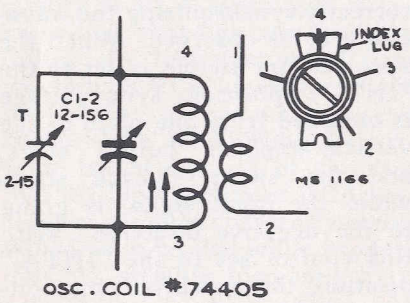
(Continued from Page 6)

is bonded to the chassis base with a copper braid.

MODEL BX55 (RC-1088B)
Oscillator-Coil Substitution

In some chassis, a substitute oscillator coil and matching tuning capacitor were used instead of the originally specified components. If replacement of the coil or capacitor becomes necessary, be sure to use the proper replacement part for the combination.

The original coil (Stock No. 74780) does not have an adjustable core. It is coded with a spot of white paint, and is wired into the circuit (not mounted to the chassis base). The substitute coil



(Stock No. 74405) has an adjustable core, is coded with a spot of green paint, and mounted on the rear apron of the chassis base. This coil should be adjusted for maximum output at 600 Kc while rocking the ganged capacitor.

The original tuning capacitor (Stock No. 74778) is stamped 941817-2; the substitute tuning capacitor (Stock No. 75149) is stamped 941817-3. The design is identical, but the capacitors differ electrically.

MODEL BX55, BX57
Change in Cabinet

Original production of cabinets for Models BX55 and BX57 used 8-32 x 3/8-inch screws (Stock No. 74301) to mount the chassis in the cabinet. The holes in the cabinet were tapped for these screws.

Present production cabinets use 6-32 thread-cutting screws. These cabinets are not tapped; do not try to force 8-32 screws into the holes of these cabinets.

ROPER SURVEY REVEALS SET OWNERS UPHOLD INTEGRITY OF TV SERVICEMEN

Recent articles which have appeared in leading magazines and newspapers accused TV servicemen of certain malpractices. These commentaries generalized that the television public was being gouged. Television set owners were perturbed. Were these accusations true? Television servicemen were annoyed. Must all of them be judged by the actions of a non-representative faction in their midst?

RCA decided to get the true facts. One of the nation's top market-research experts, Elmo Roper, was commissioned to obtain the full details from the people who were in the best position to judge—the television set owners themselves. Results of the Roper Survey were released to trade papers, Better Business Bureaus, service organizations, and the RTMA.

Mr. Roper and his staff conducted what is believed to be the first scientific, impartial, nationwide sampling ever made to determine the true public attitude toward the technicians who install and maintain the country's 17 million TV receivers. While other surveys have been conducted on this subject, they have been undertaken in local areas. The Roper survey polled 5,000 families, representing a scientifically-accurate cross-section of adults in TV areas throughout the land. The facts relative to the service industry are based on the replies received from over 90 per cent of the television homes in the sample.

Television set owners heartily endorse the TV service industry, the survey shows. Eighty-six per cent of all television set owners indicated a high opinion of the quality of work performed by the television servicemen. The great majority of the TV public, the poll points out, consider servicemen to be courteous, prompt in responding to call, *and fair and reasonable in their charges*.

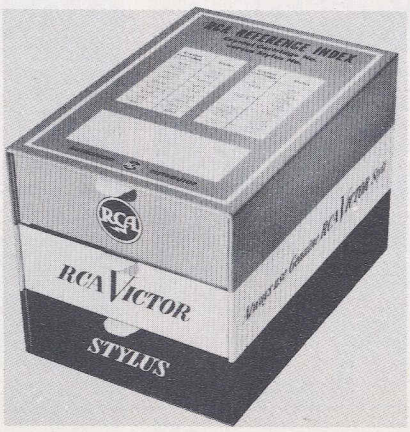
Reasons behind RCA's sponsorship of this survey were given by E. C. Cahill, president of the RCA Service Company. He said, "While we knew from experience that these 'exposés' were based on isolated instances, and did not, by any means, reflect the true character of the service industry, we were disturbed by the unfair and misleading impressions they were creating among the public. . . The findings (of the Roper Survey) have fully substantiated our confidence in the ability and integrity of television technicians."

The "exposés," the survey reveals, were merely generalizations. They did not represent the major consensus of opinion held by the TV public. Only one in ten persons queried in the survey, for instance, considered their service bills too high. Only seven in 100 expressed dissatisfaction with the work done by servicemen. Fewer than one person in 100 thought servicemen to be unpleasant and discourteous. Only one in five felt he had to wait too long for servicemen to come and repair his set.

Mr. Cahill said that probably few TV set owners realize the size and scope of the service industry. At a conservative estimate, he

(Continued on Page 10, Col. 3)

NEED A HANDY 3-DRAWER CHEST FOR STYLI AND SMALL PARTS?



You'll want several of these all-metal, 4-3/16 by 4-7/16 by 6-1/10-inch chests for your service bench. The new RCA Styli Utility Chest contains three drawers for storing styli, resistors, capacitors, fuses and many other small items. This chest and a stylus wrench are now being made available to you through your RCA Distributor as a bonus with each model inventory of RCA Victor styli ordered. Three suggested model inventories, differing only in the quantities of five different styli (Stock Nos. 70915, 72345, 74068, 74818, 75770), are available at dealers prices of $10.86, $21.72, and $32.58. Order now, and establish your shop as the neighborhood headquarters for genuine replacement parts and service for all RCA Victor phonographs.

A Top-Quality Barometer and a $10.57 Profit...Yours for a $31.43 Battery Order

The popular RCA Battery Barometer display has been recently incorporated into an RCA Battery Profit Package. This move was sparked by overwhelming dealer interest in the display, which has tremendous point-of-purchase appeal.

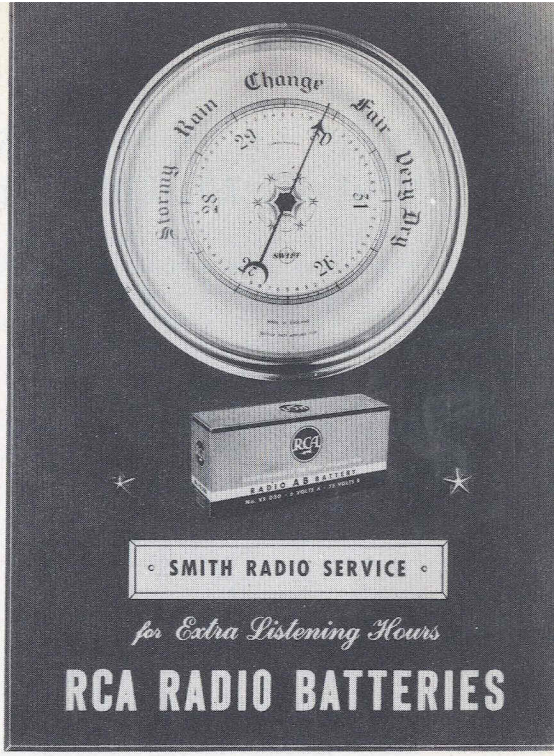
The RCA Battery Barometer Profit Package includes the smart new RCA Battery Barometer and quantities of the two fastest-selling RCA battery types—the VS036 and the VS016—at the low dealer cost of only $31.43.

Packed in the barometer package is a pre-addressed, business reply card which reads, "I have received my RCA Battery Display (Form 3F440) and desire the following personalized, engraved brass nameplate to mount on the display. I understand that this nameplate will be furnished at no additional cost to me." (Each barometer has two brass screws already in place exactly matching the holes in the nameplate.)

The RCA Battery Barometer (a $15 value, top-quality precision instrument) actually costs you nothing—the $7.50 charge for the barometer is offset by the $7.50 which you get back in full by selling the BONUS batteries!

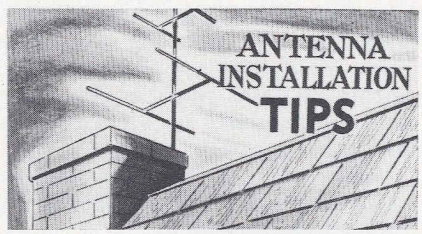
This precision barometer, mounted on a hand-rubbed, mahogany-finished plaque, provides novel point-of-purchase promotion to support your RCA battery sales program.

See your RCA Distributor today and order your RCA Battery Barometer Profit Package.



Barometer Profit Package	Sugg. Dealer Cost	Sugg. List Price
12 VS016	$21.00	$30.00
36 VS036	2.93	4.50
60 VS036	No extra charge	7.50
RCA Barometer with nameplate (3F440)	7.50	
	$31.43	$42.00

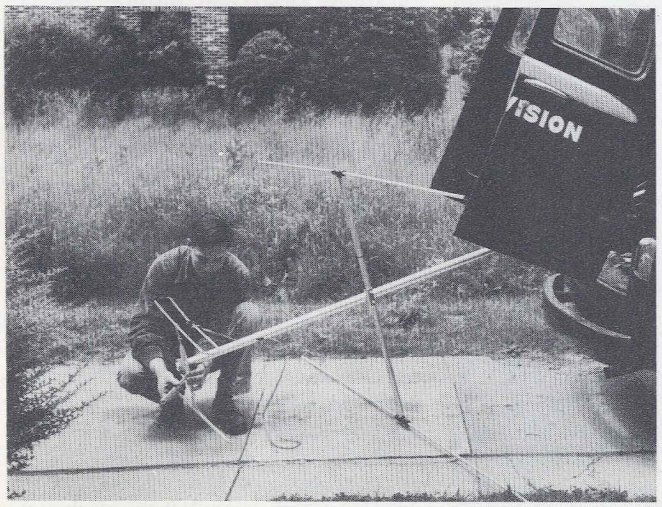
PART 5—Assembling the Antenna



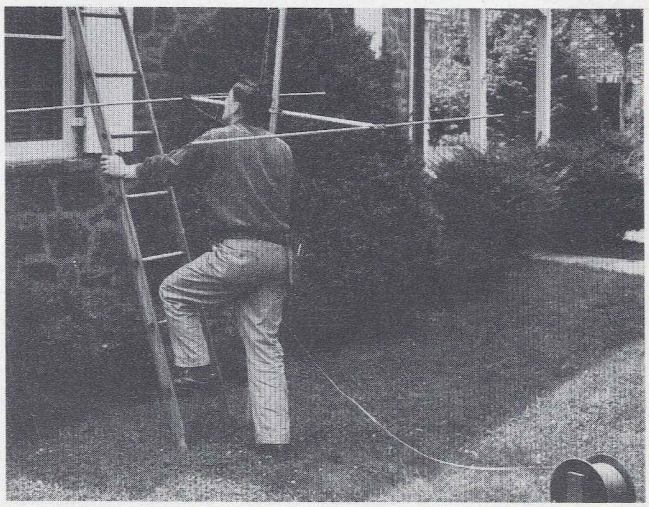
If the installation is to be made on a peaked roof, it is suggested that the antenna be assembled on the ground—for safety reasons. While on terra firma, you have the use of both hands; furthermore, you can concentrate on your work without concern over your footing on a sloping roof.

If both high- and low-band antennas are to be used, mark the mast to indicate the location of each section. Assemble the required antennas, and attach them to the mast. Orient each section of the antenna on a basis of your knowledge of the area with reference to the location(s) of the TV stations.

Attach standoffs to the mast, and connect the transmission line(s) to the antenna terminals. The use of a portable reel-holder for the transmission line is recommended. It permits the line to unwind freely without becoming tangled while the antenna is being carried to the roof. Locate the reel-holder so that the transmission line will be pulled clear of the ladder.



Do you remember the valuable time lost on your last job while trying to locate a dropped lock washer or other small piece of hardware? A little forethought will solve this annoying problem—next time, assemble the antenna on a flat portion of pavement.



For installations on a peaked roof, it is more convenient (and safer) to attach the transmission line beforehand! Note the use of a reel-holder for the transmission line. The reel-holder keeps the line taut, and clear of the ladder.

BRIGHT, COLORFUL RCA PERSONALIZED WINDOW VALANCE IDENTIFIES, ADVERTISES, AND DECORATES YOUR STORE

To provide professional display assistance to service dealers who recognize the value of a bright, attractive store front, RCA has designed a gleaming new decorative window valance, which prominently features the dealer's store name and identifies his store as a source of reliable RCA products.

The new valance is finished in the familiar RCA carton colors. When the shoplights are on, the bright red, black and white colors sparkle. The valance multiplies the value of the entire store-front by lending a cheerful atmosphere, and by enhancing the impact of all the display pieces. It attracts attention to the store, brings in new prospects, dresses up the shop, calls attention to *your name*.

The new RCA Window Valance offers you, the service dealer, all the benefits of professional design and professional window display service.

Skilled artists tailor-fit the RCA window valance to your window. Each section is matched and fitted with extreme care, so that the valance actually appears to be painted on. The valance is constructed so flexibly that it can be fitted to a window of any size, arrangement, or shape. You specify the exact product lines you want to feature . . . RCA Batteries . . . RCA Tubes . . . RCA Parts . . .RCA TV Tubes . . . and these are tailor-fitted into the valance. Your own store name appears as the most prominent element of the valance.

The professional display artists do all the work. They remove the old valance, if necessary, wash windows, carefully fit each section together with no visible seams or overlaps, varnish all edges and seams for permanency, and wash the windows again.

The RCA Window Valance is designed and manufactured for long life and durability. The valance won't fade, chip or peel; it will remain bright and attractive for years.

When you display the RCA Window Valance, it identifies you as the source of genuine RCA tubes and components, and of genuine RCA Victor replacement parts. It builds your reputation by advertising your store name.

Your RCA Distributor has complete details on the new window valance—ask him for an order form. Your valance will be installed within 30 days from the time your order is received by RCA, except in remote areas.

Order early so that your valance can be installed in time for the big Fall selling season.

Note how the dealer's name stands out . . . how the valance enhances the value of the display pieces, and attracts attention to the store.

One-Year Adjustment Policy For Renewal Kinescopes

Effective May 1, 1952, RCA kinescopes sold for replacement use in TV receivers are subject to *full* adjustment if failure occurs within twelve months from date of installation. RCA reserves the right to limit adjustment to tubes which fail within eighteen months after shipment from the Tube Department warehouse.

More than ever, RCA picture tubes represent the greatest kinescope value available. Today with every RCA picture tube you buy, you profit more from:

1. RCA's top quality.
2. RCA's greater consumer acceptance.
3. RCA's low renewal picture tube prices.
4. RCA's extensive kinescope return-exchange program.
5. A ONE-YEAR-FROM-DATE-OF-INSTALLATION RENEWAL KINESCOPE ADJUSTMENT POLICY.

ROPER SURVEY

(Continued from Page 8)

pointed out, the elaborate testing equipment, the trucks and tools required represent an investment of more than 200 million dollars!

"Television could not be the nation-wide medium it is today, with millions of receivers functioning in the American homes, if it were not for the tremendous job which has been done and is being performed by the service industry," Mr. Cahill declared. "The need for installation and servicing of these millions of television receivers, the most complex instruments ever introduced into homes, constituted an immense challenge, and the service industry has met that challenge squarely and honestly. As the survey clearly proves, television manufacturers, distributors, and dealers, as well as the thousands of independent servicemen and service associations, have discharged their responsibility with remarkable success."

WO-56A OSCILLOSCOPE

(Continued from Page 7)

the positive direction. When the switch is in the "LINE" position, a small 60-cycle voltage is taken from the power transformer to permit the sweep oscillator to be synchronized with the line frequency. The "EXT" position of the sync selector switch provides connection for any external synchronizing signal to the sweep oscillator through the front panel "SYNC" terminal.

Phase Control. An important feature of the sync system is the "PHASE" control on the front panel. This control (a 100,000-ohm potentiometer) and a 0.1-μf capacitor are connected to a 12.6-volt, center-tapped winding in the power transformer. When this voltage is fed to the input of the horizontal amplifier, it provides a sinusoidal sweep for the alignment of receiver circuits. This phase-controlled, line-frequency sweep eliminates the need for any external phasing voltage, and permits the use of the scope with sweep generators lacking a phase-controlled sweep. When the sweep oscillator is synchronized with the line frequency, the phase control may be used to center any portion of the waveshape on the cathode-ray tube screen. A phase change of approximately 130° is provided.

Shielding

In order to maintain stability at high-gain levels, careful attention has been given to shielding. A ferromagnetic shield over the gun structure of the cathode-ray tube provides protection against external magnetic fields which might affect the electron beam. The thorough shielding provided in the WO-56A permits its operation in close proximity to other test equipment such as signal generators, and sweep and marker equipment.

A large, cylindrical, retractable light-shield, mounted in the front panel, can be pulled out to shield the face of the tube from external light sources.

Calibration

To facilitate direct peak-to-peak voltage measurements, a fixed ac voltage of three volts (peak to peak) is available at the front panel for use in calibrating the screen of the tube. A calibrated graph scale, which fits over the end of the tube, is also provided with the WO-56A.

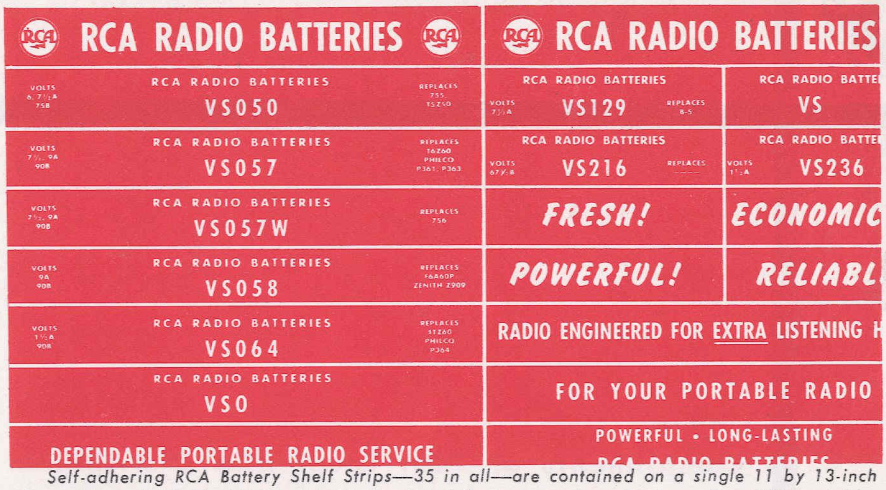
Probes and Cables

Connection to the vertical amplifier is made through a shielded cable which connects to a coaxial connector on the front panel. This cable together with its test probe gives an input capacitance of approximately 75 $\mu\mu$f across an input resistance of one megohm. The input capacitance can be reduced to less than 10 $\mu\mu$f through the use of the WG-216B Low-Capacitance Probe, which slips onto the end of the Direct Probe. This auxiliary probe introduces an insertion loss of 10, but the high reserve gain of the vertical amplifier compensates for such attenuation.

Power Supply

The power supply has a power consumption of 65 watts from a 117-volt, 60-cycle line. The power transformer is designed to have a minimum of leakage flux in order to prevent any interference with the electron beam in the cathode-ray tube. The amplifier stages operate from a low-voltage supply of 438 volts; a voltage of 1,490 volts is available for the electrodes of the 7JP1. Separate heater windings are provided for the cathode-ray tube and other stages. The primary winding of the power transformer is protected with a 1.5-ampere fuse.

BOOST YOUR BATTERY SALES WITH THESE SHELF STRIPS

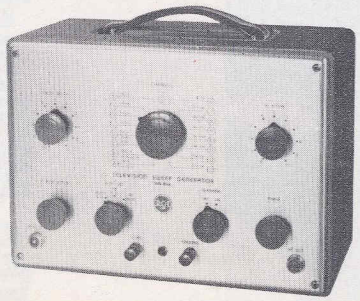


Self-adhering RCA Battery Shelf Strips—35 in all—are contained on a single 11 by 13-inch sheet. On each of 24 of these strips is imprinted the type number of a top-selling RCA portable-radio battery, its voltage, and some of the types it replaces. The rest of the strips display general product advertising on RCA batteries and portable-radio service. In addiion to dressing up your shelves, these shelf strips make it easy to maintain a balanced stock of RCA batteries.

The shelf strips are easily applied by simply peeling the strips off a thin backing sheet and applying them directly to the shelf. Obtain your supply of shelf strips from your RCA Distributor and use them to promote the sale of RCA batteries to your customers.

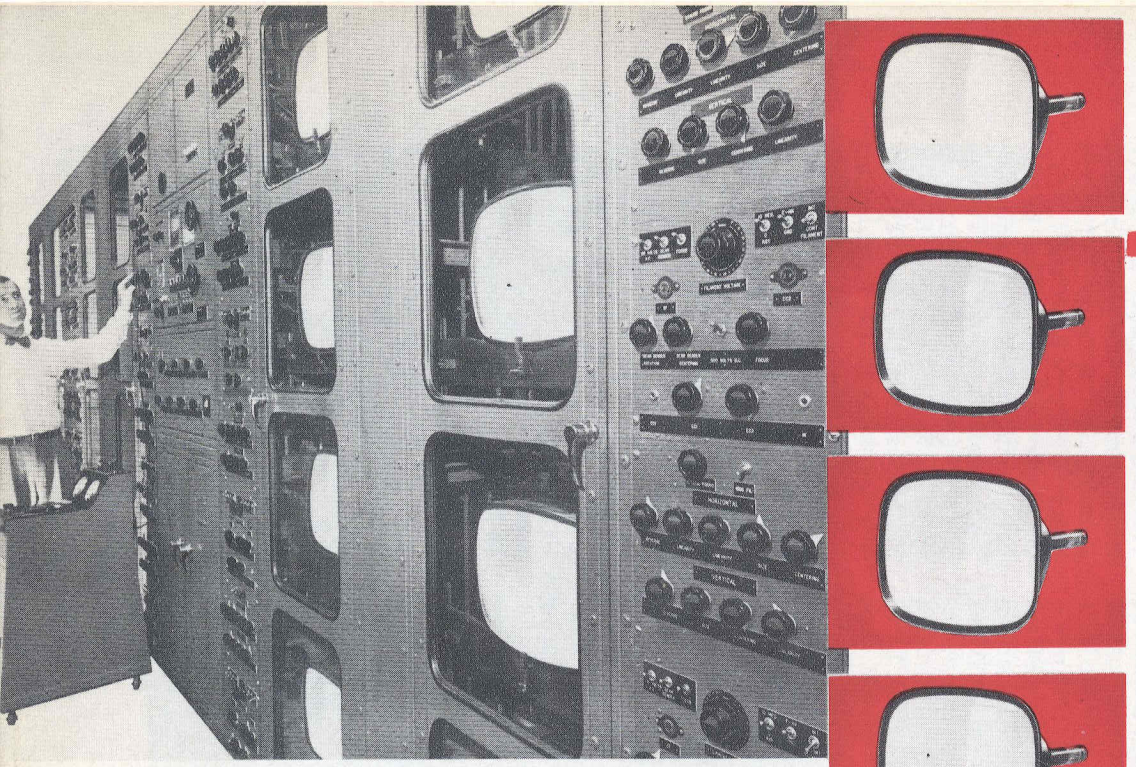
WR-59A MODIFICATION PROVIDES CONTINUOUSLY VARIABLE OUTPUT UP TO 50 MC

Recent trends in TV receiver design have incorporated if amplifiers which use traps operating in the 40 to 45 Mc region, a region heretofore not covered by the fixed positions of the selector switches in the type WR-59A TV Sweep Generator. It is possible to modify the WR-59A so that continuously variable output up to 50 Mc can be obtained.



Changes in the instrument involve: modification of the oscillator coils; changing the IF/VF SEL switch to a variable capacitor; corresponding panel lettering changes; and laboratory alignment and calibration.

Write to the RCA Service Company, Camden, New Jersey, and request a return authorization before shipping your instrument. Cost of the conversion is $35.



Specialized racks like these are used to life-test RCA Kinescopes.

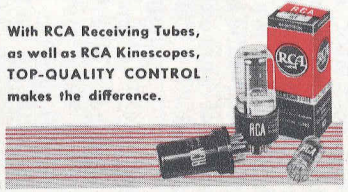
The Million-Dollar Test Equipment

. . . that pays off in better picture tubes

At RCA's picture tube plants, constant vigilance over quality is maintained with specialized test equipment valued at well over one million dollars. This huge investment is one reason why RCA picture tubes are the best you and your customers can use.

In one phase of the quality-control program, random samples of picture tubes are taken directly from the production lines and subjected to rigorous life tests in racks such as those shown. Any deviation from prescribed quality standards is promptly noted and corrected at the source. In addition, a portion of these samples is given an extended life test equivalent to *years* of actual service in the home.

RCA's constant vigilance at all stages of manufacture is your assurance that only top-quality RCA Kinescopes leave the factory. In this way, RCA closely guards its own reputation . . . *and yours as well.*



With RCA Receiving Tubes, as well as RCA Kinescopes, TOP-QUALITY CONTROL makes the difference.

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RADIO CORPORATION of AMERICA

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