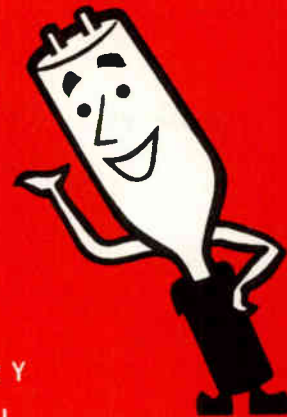




Tube Tips



A NEWSLETTER TO THE BROADCASTING INDUSTRY
RCA TUBE DIVISION HARRISON, N. J.



How to Get More Hours from an RCA-857-B Rectifier Tube

Broadcasters can increase the life of their RCA-857-B rectifier tubes if they follow these 10 rules:

- Hold filament voltage at 5 volts—at tube terminals.
- Hold condensed-mercury temperature within minimum and maximum ratings (25° C to 60° C with maximum peak inverse anode voltage of 10 Kv; 30° C to 40° C with maximum peak inverse anode voltage of 22 Kv measured at the bottom of the glass envelope, close to the base).
- Heat filament fully before applying anode voltage.
- After transporting tube, do not apply anode voltage until mercury has been redistributed (by heating filament only for 30 minutes).
- After idle periods, raise anode voltage slowly to the normal operating value.
- Keep rf out of rectifier compartment.
- Utilize quadrature operation—filament voltage should be zero when anode is at peak voltage.
- Adjust circuit breaker so that opening time does not exceed "fault" time.
- Operate tube within RCA ratings.
- Operate spare RCA-857-B's periodically.

New RCA Tube Types

RCA-1818-P1, -1818-P11, and -1818-P27 are 10-inch round glass cathode-ray tubes primarily intended for use in equipment which photographically transcribes color-television broadcasts on color motion-picture film, but are also useful in color-television monitor service.

All three of these tubes utilize magnetic deflection (50 degrees) and electrostatic focus. Each has an aluminized screen, a flat faceplate, and an external conductive coating. The 1818-types differ from each other only in the characteristics of their respective phosphors—P1 (green), P11 (blue) and P27 (red).

Distributor Resale prices (optional) are as follows: RCA-1818-P1 Transcriber Kinescope, \$505.00; RCA-1818-P11 Transcriber Kinescope, \$700.00; RCA-1818-P27 Transcriber Kinescope, \$505.00.

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RCA-6894 and -6895 are half-wave, mercury-vapor rectifier tubes intended for use in high-voltage rectifier circuits designed to supply dc power with good regulation to broadcast transmitters and industrial types of electronic equipment. The ratings of these two tubes make them companion types to the RCA-5563-A mercury-vapor thyatron.

Alike except for their bases, the 6894 and 6895 are capable of withstanding a maximum peak inverse anode voltage of 20,000 volts. Each can deliver a maximum peak anode current of 11.5 amperes and a maximum average anode current of 2.5 amperes in quadrature operation.

Three 6894's or 6895's in a half-wave, three-phase circuit with in-phase operation are capable of supplying up to 51 kilowatts at a dc voltage up to about 9500 volts; or six of them in a series, three-phase circuit with quadrature operation can supply up to 143 kilowatts at a dc voltage up to about 19,000 volts.

The 6894 and 6895 are both shock-resistant and vibration-resistant because of their rigid internal structure. The 6894 and 6895 can be used as direct replacements for the 575-A and the 673, respectively.

Distributor Resale prices (optional) are as follows: RCA-6894, \$25.00; RCA-6895, \$25.00.

* * *

RCA-6849 is a new image orthicon which is primarily intended for use in industrial and scientific-research television applications involving extremely low light

levels. It combines extremely high sensitivity with a spectral response closely approaching that of the human eye.

The 6849 is capable of extending the range of human vision by amplifying low-intensity light images when they are brightly displayed on a television picture tube.

When used in a standard television system and with proper low-noise amplifiers, the 6849 can produce signal information with illumination on the photo-cathode as low as 0.00001 foot-candle.

Distributor Resale price (optional) for the RCA-6849 is \$1,425.00.

New Price Schedule for RCA Industrial-Type Tubes

The RCA Tube Division has prepared a new eight-page Distributor Resale Price Schedule (Form 3F801-E) which confirms additions, deletions, and changes to February 1, 1957. It contains complete up-to-date facts and figures on approximately 280 RCA industrial receiving, power, cathode-ray, and phototube types, including their optional resale prices, capsule descriptions, approximate shipping weights, and adjustment codes.

A copy of the new schedule is enclosed with chief engineers' copies of this issue of TUBE TIPS. For additional copies of the Distributor Resale Price Schedule, see your RCA distributor or write RCA Order Service, 34 Exchange Place, Jersey City 2, N. J.

New RCA Test Equipment Announced

Three new test instruments have been added to the RCA line of test equipment designed for the maintenance of radio and television equipment. Now available from your local RCA distributor, the new instruments are the WV-77C Junior *VoltOhmyst*®, WV-87B Master *VoltOhmyst*®, and the WO-78B Oscilloscope.

Expanded HB-3 Handy Reference for Broadcast Engineers

For quick-to-find, right-at-hand information on all of RCA's ever-increasing number of tube types and semiconductor products, more and more broadcast engineers are relying on the technical data sheets contained in the RCA Tube Handbook HB-3.

With an additional binder (Vol. 9-10) recently made available to accommodate the increasing number of sheets, the Handbook now consists of five binders and contains 3,600 pages (1,800 sheets) of data for more than 900 RCA tube types and semiconductor products.

Handbook service mailings now average 68 sheets and are sent to subscribers six times a year on a bi-

The WV-77C Junior *VoltOhmyst* is a lightweight, compact, versatile instrument designed for reliable measurements in the maintenance of radio and television equipment, as well as other electronic equipment.

The WV-77C has been provided with an improved switch-type probe (WG-299B). This single-unit, dc/ac-ohms probe and cable has a built-in switch for quick measurement of dc-voltages, or ac-voltages and resistances, without changing probes and cables.

Additional features include zero-center indications, separate scales for low ac-voltage measurements, measurement of the ac or dc component of a signal, a built-in 1-megohm isolating resistor in the probe to minimize capacitance-loading effects, and electronic protection against meter burnout.

* * *

The WV-87B Master *VoltOhmyst* is an extremely reliable instrument for measurements involving radio and television equipment. It is an all-electronic voltmeter designed to measure directly, on separate scales, the peak-to-peak values of complex waveforms and the rms values of sine waves.

The instrument also reads dc voltage, resistance, and direct current. It is frequency-compensated on ac-voltage ranges up to and including the 500-volt range (500 rms volts or 1400 peak-to-peak volts) and can be used at frequencies up to approximately 3 Mc, depending upon the impedance of the voltage source.

With the auxiliary RCA WG-301A Crystal Diode Probe, the usable frequency range is extended to 250 Mc.

Measurement accuracy is within $\pm 3\%$ of full scale on dc-voltage, ac-voltage, and direct-current measurements. To eliminate meter-pointer parallax, a mirror-backed meter scale has been added.

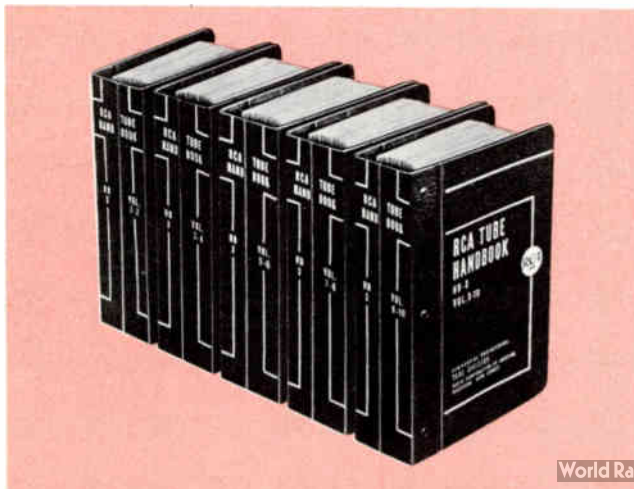
The WV-87B utilizes the WG-299C DC/AC-Ohms Probe and extra-flexible cable. The probe contains a built-in switch for selection of the desired measurement function. The front end of this probe is designed to ac-

monthly basis. These figures represent an increase in service to Handbook subscribers of 31% during the past year.

Available from RCA Commercial Engineering, 415 S. 5th St., Harrison, N. J., the complete RCA Tube Handbook HB-3 (Vols. 1-2, 3-4, 5-6, 7-8, and 9-10), plus service for one year, is \$17.50 in the United States and its possessions; \$18.50 in all other countries. After the first year, the annual service fee is \$3.00 for domestic subscribers and \$3.50 for foreign subscribers.

If you already are a Handbook subscriber and have not yet obtained the fifth binder (Vol. 9-10), you may order it from RCA Commercial Engineering. Requests for the new binder will be handled as well as requests for replacements of any of the four previously issued binders which you may now possess, but which may be the worse for wear.

Each of the five binders are individually priced at \$2.25 in the United States and its possessions; \$2.50 in all other countries. When forwarding your order to RCA Commercial Engineering for any of the binders, please be sure to specify which binder is desired and include the serial numbers (located at the bottom of the inside back covers) of your present Handbook binders for positive registration identification.



commodate the slip-on WG-301A Crystal Diode Probe to form a sturdy insulated high-frequency probe.

DC voltages up to 50,000 volts can be measured when the auxiliary WG-289 High-Voltage Probe is used.

* * *

The WO-78B 5-inch Oscilloscope is a high-quality, dual-bandwidth oscilloscope especially designed for the maintenance of both color and black-and-white television equipment.

When the front-panel bandwidth switch is in any one of its seven wide-band positions, the frequency response of the instrument is flat within -1 db from 3 cps to 5 Mc with a sensitivity of 0.1 volt peak-to-peak per inch. With the bandwidth selector switch in any one of its narrow-band positions, the frequency response is flat within -3 db from 3 cps to 500 Kc and the unit has a sensitivity of 0.01 volt peak-to-peak per inch.

A built-in voltage-calibrating circuit provides for direct calibration of the graph screen without requiring any external connections and without disconnecting the input to the scope.

Switch positions for TV-line and field-scanning frequencies facilitate TV signal-tracing and trouble-shooting. A limiter stage in the sweep circuit insures the proper sync level for "lock-in" over a wide range of input frequencies and voltages. Two of four sync switch positions permit lock-in on either the positive or negative portions of the vertical-input waveform. The other two sync switch positions permit a choice of either an internal sync voltage at power-line frequency or an external signal for synchronizing the internal sweep oscillator.

Additional features include a separate phase control which enables the instrument to be phased with an external modulated sweep oscillator; automatic regulation of critical voltages; and a removable green-graph screen scaled in inches and tenths of an inch. All operating and routine maintenance controls are accessible from the outside of the cabinet.

A Z-axis input is another feature of the new WO-78B. The Z-axis permits injection of brightening or darkening markers on the cathode-ray oscilloscope trace.

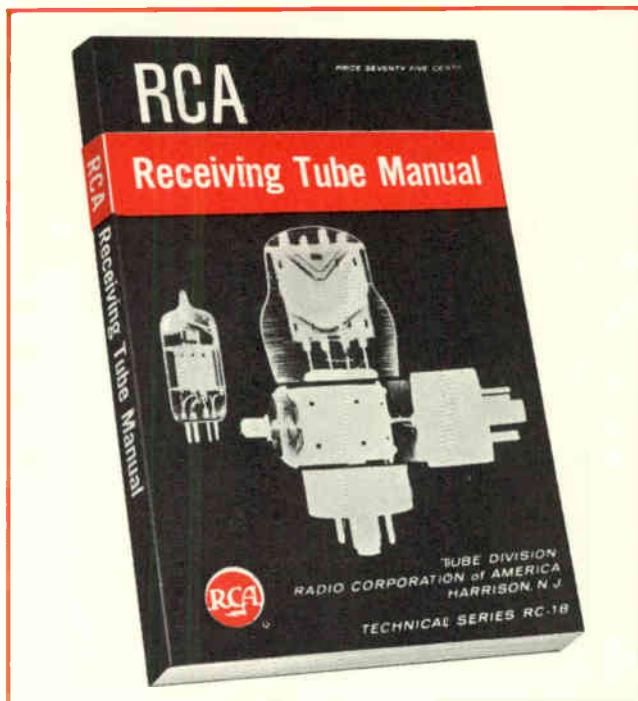
The WO-78B is equipped with the WG-300B Direct/Low-Capacitance Probe and Cable which connects to the V input terminal. The new probe permits the use of the WO-78B in circuits which would not function properly if connected directly to an oscilloscope.

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User prices (optional) are as follows: WV-77C Junior *VoltOhmyst*, \$59.50; WV-87B Master *VoltOhmyst*, \$137.50; WO-78B Oscilloscope, \$475.00.

Image Orthicon 'Sealed Carton' Policy

Television broadcasters are reminded that, for their protection, all new RCA image orthicon camera tubes are sealed at the factory in special tamper-proof containers. The reason for this policy is a simple one: image orthicons are subject to a slight target burn, even during the short time required for the recipient to test them, and the burn would immediately brand them as "used tubes." To assure broadcasters that there has been no prior use of their new RCA image orthicons, each one is packaged in a transparent-plastic, factory-sealed carton which assures broadcasters that it is a fresh tube.



Revised Edition of Receiving Tube Manual Issued by RCA

A new, revised, and expanded edition of the popular RCA Receiving Tube Manual was recently published. Identified as the RC-18, this up-to-date, 352-page book contains technical data on more than 575 receiving tubes. In addition, over 75 color and black-and-white picture tubes are described.

Written in an easy-to-understand style, the RC-18 covers basic tube theory and application information. The section covering electron tube applications has been expanded to include a description of television applications such as tuner circuits, video amplifiers, sync circuits, agc circuits, and deflection systems. Other sections include information on generic tube types, interpretation of tube data, and electron-tube installation.

A receiving-tube classification chart is arranged to facilitate rapid selection of RCA types according to their family class, functions, and filament or heater voltages. Types having similar characteristics with the same heater or filament voltage are bracketed. Types designed for series-string applications are specially marked for easy selection.

A chart showing picture-tube characteristics permits quick comparison of the features of individual types. Basing diagrams are given on the accompanying page.

A section covering circuits describes typical applications, such as superheterodyne, superregenerative, and short-wave receivers, AM and FM tuners, various types of amplifiers, a code-practice oscillator, a six-station intercom, and high-fidelity audio amplifier circuits including a low-distortion input amplifier stage, a two-stage input amplifier using cathode-follower (low-impedance) output, a bass and treble tone-control amplifier stage, and a complete 10-watt "hi-fi" amplifier.

Copies of the RCA Receiving Tube Manual (RC-18) may be obtained from RCA tube distributors, or by sending 75 cents to Commercial Engineering, RCA Tube Division, 415 S. 5th St., Harrison, N. J.

New Standard of Comparison in Pick-up Tubes

RCA MICRO-MESH IMAGE ORTHICONS



Commercially Proved—On-Air for dependable, improved picture quality

Designed to keep pace with ever-improving programming techniques, RCA "MICRO-MESH" Image Orthicons are being acclaimed by station men as the finest camera tubes ever used in commercial television.

With a mechanical exactness heretofore unattainable, RCA MICRO-MESH design has increased the mesh fineness of camera tubes from 500 lines per inch—to 750 lines per inch! This improvement works for you three ways. (1) It enables you to "kill" mesh pattern and moiré effect without need for defocussing the picture—whether you are on black-and-white or color. (2) It substantially improves picture-detail contrast. And (3) RCA Image Orthicons with MICRO-MESH are particularly effective in permitting the use of adequate aperture correction to improve detail contrast when the tube is operated below the "knee" of its transfer characteristic—as occurs in color television.

MICRO-MESH design—another RCA original development in TV camera tubes—exceeds all present-day requirements for high-quality pictures in all RCA Image Orthicons and Vidicons—at no extra cost to you. RCA camera tubes with MICRO-MESH are available from your RCA Tube Distributor. For technical data on RCA camera tubes, write RCA Commercial Engineering, Harrison, N. J.



CAMERA TUBES FOR TELECASTING

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Tube Division, Harrison, N. J.

World Radio History

Why Station Men like MICRO-MESH

- Eliminates mesh pattern and moiré effect without defocussing.
- More than meets all technical requirements of 525-line TV system.
- 750-mesh tube with aperture-correction circuit provides 100% response for 350-line information. 500-mesh tube without aperture-correction circuit permits only about 60% response for 350-line information. Although correction circuit can be used with 500-mesh tube, such use emphasizes moiré and beat-pattern problems.
- Micro-Mesh minimizes beat pattern between color subcarrier and frequency generated by beam scanning mesh-screen pattern.
- Improves detail of color pictures.