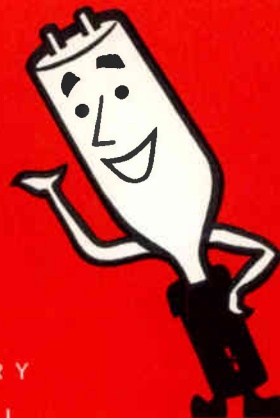




Tube Tips



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

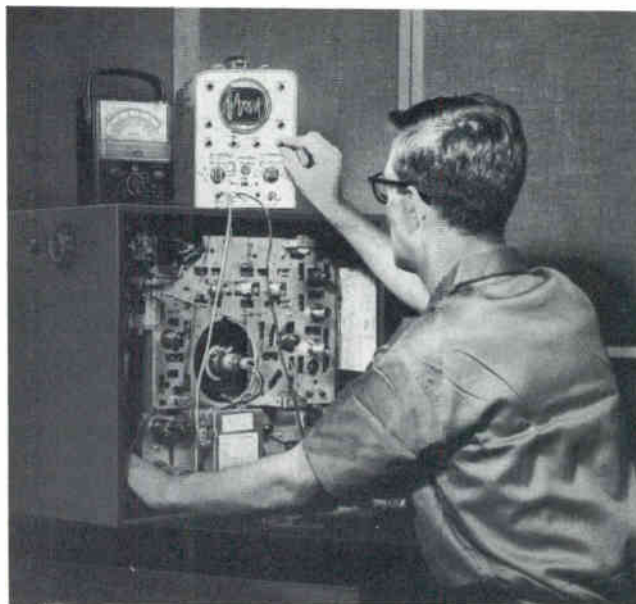
Exciting New Test Equipment Kits to Help Broadcast Technicians

Two additional test equipment kits have been added to the RCA line since the WV-77E(K) VoltOhmyst® initiated the series last spring. These are the WO-33A(K) Oscilloscope and the WV-38A(K) Volt-Ohm-Milliammeter. Portable, compact, highly versatile, and attractively styled, the new instruments—like the Volt-Ohmyst—are also available in factory-wired and calibrated form.

As kits, the WO-33A(K) and WV-38A(K) are designed for simple step-by-step construction. Each unit is shipped with assembly instructions and oversized drawings and contains a laminated circuit board for easy, accurate assembly. The components, keyed to their proper location, are mounted on one side of the circuit board and solder connections are made on the other side.

The WO-33A 3-Inch Oscilloscope may be termed an "all-purpose" instrument which has excellent bandwidth for servicing color television video broadcast monitors and cameras. It is also highly suitable for square-wave testing of audio and ultrasonic equipment and has all the gain necessary for low-level audio work—servicing pickups, microphones, preamps; plus signal tracing radios, amplifiers—trouble-shooting communications signaling systems, "ham" radio and high-fidelity equipment, industrial electronics machinery, and many other applications.

The laminated circuit board and module-type construction of the WV-38A(K) VOM speed up and simplify assembly.



For checking TV monitors in the studio or on location—the WO-33A(K) Oscilloscope and WV-38A(K) VOM.

Additional features of the WO-33A are its voltage calibrated, frequency-compensated, 3-to-1 step attenuator; its scaled graph screen and calibrated voltage source, which allows direct reading of peak-to-peak voltages; its "Plus-Minus" internal synchronization, which holds sync to 4.5 megacycles; and its shielded input cable, which includes a low-capacitance probe.

The WV-38A Volt-Ohm-Milliammeter is capable of measuring from 0 to 5,000 volts dc in eight ranges; 0 to 5,000 volts ac in six ranges; currents from 50 microamperes full scale to 10 amperes full scale in six ranges; and resistance from 0 to 20 megohms in three ranges. Special features include an ohms-divider network which is fuse protected; a polarity-reversal switch; a full-wave bridge rectifier; and new handle clips to accommodate probes and test leads for extra carrying convenience. This new VOM contains a 1-volt scale and a 0.25-volt scale for transistor-circuit measurements. An extra-large, 5¼-inch meter enables fast and easy reading.

The WO-33A(K) Oscilloscope kit has a User price (optional) of \$79.95; the WV-38A(K) Volt-Ohm-Milliammeter kit has a User price (optional) of \$29.95. User prices (optional) of the factory-wired and calibrated equivalents of these two kits are: \$129.95 for the WO-33A Oscilloscope; \$43.95 for the WV-38A VOM.

THE 'PREMIUM' TUBE STORY

"Coming up to air time . . . standby on film . . . roll film . . . 3 . . . 2 . . . 1 up on film . . . standby on camera one . . ." This is the daily routine in television stations all over the country. And at any moment it can mean disaster: a fused circuit or a damaged camera tube.

In order to circumvent these problems, broadcast engineers are continually seeking the finest, most reliable equipment. And when tubes and parts have to be replaced, they look for the very best types for their studio and mobile equipment. To assist broadcasters in their search for these "very best types," TUBE TIPS has decided to include in this issue a special supplement listing some of RCA's famous "premium" tubes. All types listed have application in broadcast station equipment.

What are "premium" tubes? RCA manufactures its "premiums" especially to meet demands of dependability and performance. They have to meet certain rigid quality-control standards. For example, "premiums" are tested for stability and survival rate, 500-hour and 1000-hour life (where applicable), audio frequency noise, and microphonics. During manufacture, "premiums" are monitored carefully for heater-cycling life performance, low-frequency vibration, fatigue, shock, and glass strain. They undergo microscopic inspection of 25 categories of tube workmanship.

Broadcasters seeking replacement tubes for their fixed or mobile station equipment are urged to investigate the excellent characteristics of RCA "premium" tubes. In the list below, the prototype number is printed alongside for reference. However, "premium" types may differ from their prototypes in electrical and/or mechanical characteristics, physical structure, or types of tests to which they are subjected. Tube data, therefore, should be checked before replacing a type in the prototype column with a listed "premium."

MINIATURE, GLASS, AND METAL TYPES

Name	RCA "Premium" Type	Prototype	Class	Name	RCA "Premium" Type	Prototype	Class
GLOW DISCHARGE TUBES				TWIN TRIODES			
Voltage Regulator	OA2-WA	OA2	7-pin min.	High-Mu	12AT7-WA	12AT7	9-pin min.
	OB2-WA	OB2	7-pin min.		5691**	6SL7-GT	glass-octal
	6073	OA2	7-pin min.		5751	12AX7	9-pin min.
	6073/OA2	OA2	7-pin min.		5751-WA	12AX7	9-pin min.
	6074	OB2	7-pin min.		6201	12AT7	9-pin min.
	6074/OB2	OB2	7-pin min.	PENTODES			
	6626/OA2-WA	OA2	7-pin min.	Sharp-Cutoff	6AC7-W	6AC7	metal-octal
Voltage Reference	5651-WA	5651	7-pin min.		6AU6-WA	6AU6	7-pin min.
					5654	6AK5	7-pin min.
					5654/6AK5-W	6AK5	7-pin min.
					5654/6AK5-W/ 6096	6AK5	7-pin min.
					5693**	6SJ7	metal-octal
					5725	6AS6	7-pin min.
					6136	6AU6	7-pin min.
					6186/6AG5-WA	6AG5	7-pin min.
				Remote-Cutoff	5749	6BA6	7-pin min.
					5749/6BA6-W	6BA6	7-pin min.
				PENTAGRID CONVERTER			
					5750*	6BE6	7-pin min.
				BEAM POWER TUBES			
					5686*	—	9-pin min.
					6005	6AQ5	7-pin min.
					6005/6AQ5-W	6AQ5	7-pin min.
					6005/6AQ5-W/ 6095	6AQ5	7-pin min.
				FULL-WAVE VACUUM RECTIFIER			
					5690**	—	glass-octal
				THYRATRONS			
					2D21-W	2D21	7-pin min.
					5727	2D21	7-pin min.
					5727/2D21-W	2D21	7-pin min.

*For renewal use only

**"Special Red" types. Warranted for 10,000 hours



TWO NEW BEAM POWER TUBES

In keeping with the ever-increasing interest shown by broadcasters in small transmitting tubes, TUBE TIPS wishes to inform station engineers that two new types in this category were recently announced by the RCA Electron Tube Division: the 7270 and 7271.

As high-perveance beam power tubes with high power gain, the RCA-7270 and -7271 are designed for use respectively in fixed and mobile equipment as rf power amplifiers, oscillators, af power amplifiers, and modulators. These two tubes are identical except for heater ratings. The 7270 has a 6.3-volt, 3.1-ampere heater, while the 7271 has a 13.5-volt, 1.25-ampere heater.

Under ICAS conditions, each of these types has a maximum plate dissipation rating of 80 watts and can be operated with a cw input of 315 watts up to 60 Mc or with 235 watts cw input as 175 Mc. In addition, as linear rf power amplifiers in single-sideband suppressed-carrier service, the 7270 and 7271 under typical ICAS conditions can each provide a useful power output of about 135 watts.

The 7270 is intended primarily for new power-line operated fixed-station equipment. On the other hand, the 7271, with its 13.5-volt/1.25-ampere heater, is intended primarily for operation in mobile equipment having a nominal 12-volt power-supply system. In properly designed equipment, a 10% reduction in the voltage of a 13.5-volt power supply will result in less than a 3 db decrease in useful power output from any individual 7571.

Small and compact for their power-output capability, these new beam power tubes have a rugged button-stem construction with short internal leads, internal shield connected to grid No. 2 within the tube, triple base-pin connections for grid No. 2 to permit effective rf grounding, plate structure with large radiating fins for effective cooling, and sturdy electrode structure. The plate lead is brought out of the bulb to a rigid terminal opposite the base to facilitate separation of input and output circuits.

Both the 7270 and 7271 have the same Distributor Resale price (optional) of \$19.70.

How to Obtain Optimum Performance from the RCA-5820 Image Orthicon

Optimum performance will be realized from the RCA-5820 image orthicon TV camera tube if the following eight considerations are met in operation:

- Never exceed the operating temperature of 50° C on any part of the glass tube. The image section of the 5820 should never fall below 35° C during operation. No part of the bulb should run more than 5° hotter than the image section to prevent cesium migration to the target.
- Always allow the tube to warm up from 15 to 30 minutes prior to operation. The lens of the television camera should be capped during warm-up and standby periods. As an alternative method to capping, the photocathode voltage may be turned off during standby periods.
- Do not focus the 5820 on a stationary bright scene or use more illumination than is necessary since this may cause a retained image which may take some time to disappear.
- Never operate an image orthicon without scanning and never underscan the target. Underscanning produces a larger-than-normal picture on the monitor. If the target is underscanned for any length of time, a permanent change in target-cutoff voltage of the underscanned area takes

place with the result that, when full-size scanning is restored, the underscanned area will still be visible in the picture.

- Determine the proper operating point of the 5820 with the target voltage adjusted to exactly 2 volts above target cutoff. Do not use a higher value of target voltage than that recommended. The target-voltage control should not be used as an operating control to match pictures from two cameras.
- Do not operate an RCA-5820 which has an ion spot. This is a white spot which does not change in size when the beam-focus voltage is varied, and can be seen in the center of the picture (even when the camera lens is capped). If an ion spot is observed during operation, remove the tube from service and return for reprocessing.
- Never turn off the beam while voltages are applied to the photocathode, grid No. 6, target, dynodes, and anode during warm-up or standby operation.
- Place spare 5820's in service at least once a month in order to keep them free from traces of gas which may be liberated within the tube during prolonged storage. New tubes should be placed in service and operated for several hours on receipt before storage. Every 5820 in operation should be given an idle period every 200 hours.

Consult the technical bulletin available on request from Commercial Engineering, RCA Electron Tube Division, Harrison, N. J.

RCA SOUND TAPE



for broadcast recording applications

Famous RCA dependability is now available to you in your critical broadcast recording applications. A premium quality product, RCA *SOUND TAPE* minimizes drop-outs, tape breakage, distortion, and the loss of air time. And the built-in dry lubricant Dimethyl Silicone reduces friction and head wear for the life of the tape. Available on hub or reel, splice-free acetate base tapes are supplied in 2400 and 3600 foot lengths, and splice-free Mylar* base tapes are supplied in 2400, 3600 and 4800 foot lengths.

So for high tensile strength, essentially flat response throughout the entire audio-frequency spectrum, and for uniformity of output from reel to reel, always specify RCA *SOUND TAPE* for broadcast recording applications.

Your local Authorized RCA Distributor carries the complete line of RCA *SOUND TAPE*. For outstanding service and quick delivery, give him a call today!

* DuPont Reg. TM



RADIO CORPORATION OF AMERICA
Electron Tube Division
Harrison, N. J.

U.S. POSTAGE
3¢ Paid
Permit No. 143
Harrison, N. J.

Return Postage Guaranteed



RADIO CORPORATION OF AMERICA
ELECTRON TUBE DIVISION
415 S. Fifth Street
Harrison, New Jersey

STATION WDFD RS
GARLAND AT FIRST AVE
FLINT 2 MICH

Att: Chief Engineer

FORM 3547 REQUESTED