RCA TUBE TIPS

A NEWSLETTER TO THE BROADCASTING INDUSTRY

RCA TUBE DIVISION HARRISON, N. J.

Number 117

August, 1956

New Micro-Mesh Screens in RCA Image Orthicons Offer Broadcasters Improved TV Picture Quality, Eliminate Mesh Patterns and Moiré Effect

The image-orthicon types RCA-5820 for black-and-white and the RCA-6474/1854 for three-tube color cameras are now being quantity-produced by RCA for the broadcasting industry with Micro-Mesh, a 750-mesh screen which replaces the 500-mesh screen formerly used in both types. Representing a major development in image-orthicon design that substantially improves the picture quality of TV cameras, even beyond present-day high quality standards of performance, the 750-mesh screen eliminates mesh pattern and moiré effect *without any need for defocusing* either in black-and-white or color TV. The new Micro-Mesh more than meets all technical requirements of a 525-line TV system.

Under continuous development for more than five years at RCA, RCA Micro-Mesh permits improved picture-detail contrast and is particularly effective in color cameras where such contrast cannot be improved by operating the tube "above the knee." In addition, the 750-mesh screen minimizes the beat pattern between the color sub-carrier and the frequency generated by the beam scanning the mesh-screen pattern.

In color cameras with an aperture-correction circuit, the improved 6474 can provide 100% response for 350-line information. This is in contrast to operation of the 500-mesh image orthicon without an aperture-correction circuit, where such operation permits only about 60% response for 350-line information. Although a correction circuit can be used with a 500-mesh tube, such use emphasizes moiré and beat-pattern problems.

To achieve the goal of a 750-mesh screen, it was necessary for RCA to develop its own mesh-making techniques and equipment. Included in the task was the design of a ruling engine of sufficient accuracy to produce the "master" matrices from which the gossamer-like screen can be produced in quantity and with a mechanical uniformity heretofore unattainable.

RCA image-orthicon types 5820 and 6474 with new Micro-Mesh are available immediately – at no increase in price – from your RCA tube distributor. Distributor Resale prices (optional) of the RCA-5820 and -6474 are $1200 and $1700, respectively.

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Developmental RCA Vidicon, 1/2-Inch in Diameter, Serves As Pick-Up Tube In Transistorized Portable Television Camera Weighing Only Four Pounds

A developmental RCA Vidicon camera tube only ½-inch in diameter and no longer than a king-sized cigarette is the "eye" of a highly miniaturized, transistorized RCA TV camera and portable transmitter that is being utilized for spot news telecasting and other TV field pick-up functions on an experimental basis by the National Broadcasting Company in TV coverage of the National Political Conventions. The new system – perhaps the most compact and complete yet designed for transmitting TV pictures – includes a four-pound camera equipped with a novel electronic view-finder, and a 15-pound back-pack transmitter capable of sending TV signals to a base station more than a mile away. A battery supply in the back-pack can operate both camera and transmitter for about five hours.

In spite of its relatively minute size, the developmental Vidicon used in the new camera has a sensitivity greater than that of the present one-inch Vidicon pick-up tube commonly used in portable TV cameras. The tube, developed at the David Sarnoff Research Center of RCA in Princeton, N. J., employs a light-sensitive surface of an improved type.

The transistorized camera utilizing the tiny Vidicon is equipped with an electronic view-finder which can be detached from the camera and hung around the cameraman's neck. Since the view-finder is electronically synchronized with the camera, it displays a scene as viewed by the camera lens even when the two elements are separated in this fashion. Thus, the cameraman can look into the view-finder to observe a scene being picked up by the camera, while the camera itself is held overhead to see over a crowd or other obstacle.

RCA Developmental Image Orthicon For Operation at Extremely Low Light Levels

Engineers of the RCA Tube Division have designed a developmental image orthicon intended for use in industrial and scientific-research television applications involving extremely low light levels. Featuring a combination of extremely high sensitivity with a spectral response approaching that of the human eye, this developmental tube is capable of extending the range of human vision by amplifying low-intensity light images so that the eye can see details in the amplified images when they are brightly displayed on a television picture tube.

Used in a standard television system, and with proper amplifying equipment, the new developmental camera tube can produce signal information when its photocathode is subjected to an illumination as little as one one-hundred-thousandth of a foot-candle. This is equivalent to the illumination produced by a candle at a distance of about 300 feet.

The structure of this developmental tube differs mainly from that of the conventional image orthicon in the much greater spacing between the target glass disc and the fine mesh screen. The effect of this greater spacing is the generation of higher image-charge voltages at the target when the light reflected from the televised image strikes the photo-sensitive surface of the tube. This increased spacing makes it possible for the tube to function at extremely low light levels without introducing "smearing" of the reproduced image.

TUBE TIPS

New Tipless RCA Vidicon Permits Improved TV Camera Pick-Up

The RCA-6326-A Vidicon, a small camera tube for use in compact color-TV cameras using the method of simultaneous pick-up of film or live subjects, was recently announced by the RCA Tube Division. The new tube is also suitable for use in black-and-white TV cameras for either film or live pick-up. In either color or black-and-white service, the 6326-A, with its resolution capability of about 600 television lines, can provide a picture of high quality for broadcasting applications.

Featured in the design of the 6326-A is a tipless structure which allows the use of a longer deflecting yoke than is permitted with the side-tip structure heretofore used in the manufacture of Vidicons. The longer yoke offers TV broadcasters the advantages of less deflecting power and a narrower deflecting angle which effectively reduce deflection distortion and improve the center-to-edge focus of the scanning beam.

The 6326-A has a sensitivity such that it requires illumination levels comparable to those required for motion-picture film cameras. The spectral response of the 6326-A covers the entire visible spectrum and makes it possible for the tube to translate color accurately when operated in a color camera with appropriate color filters and optical arrangements.

Distributor Resale price (optional) of the RCA-6326-A is $565.00.

Valuable Technical Data on RCA Transmitting Tubes Featured in New Manual

Broadcast engineers will want a copy of "RCA Transmitting Tubes," a 256-page manual published recently by the RCA Tube Division. This new book contains up-to-date comprehensive and authoritative technical data on 112 types of power tubes having plate-input ratings up to four kilowatts, and on 13 types of associated rectifier tubes. Included in the manual are data representing maximum ratings, operating values, characteristic curves, outline drawings, and socket-connection diagrams.

Covering basic theory of power tubes and their application in an easy-to-understand style, "RCA Transmitting Tubes" also contains information on generic tube types; tube parts and materials; tube installation and application; rectifier circuits and filters; interpretation of tube data; and the step-by-step design of audio-frequency power amplifiers and modulators, radio-frequency power amplifiers, frequency multipliers, and oscillators. Simple calculations are given for determining proper operating conditions for tubes in class C telegraphy service, plate-modulated class C telephony service, frequency multipliers, and class AB and class B audio-frequency amplifiers. Rapid selection of an RCA power tube or rectifier tube for a specific application is facilitated by reference to a series of five classification charts immediately preceding the tube-data section in the new manual.

A reference work that belongs on every broadcast engineer's desk, "RCA Transmitting Tubes" (Technical Manual TT-4) may be obtained from RCA tube distributors, or by sending $1.00 to Commercial Engineering, RCA Tube Division, 415 S. 5th St., Harrison, N. J.

RCA Time-proved Tube Designs—for longer service

10,273 HOURS "ON-AIR"

. . . in almost 2 years of operation

It takes *stamina* to withstand the wear and tear of day-in, day-out operation in a high-power television transmitter—and RCA power tubes really have it.

From WTCN-TV, for example, Chief Engineer Joseph Kahnke recently reported that an RCA-6166 in the 30-kw aural amplifier of the RCA-50-kw "VHF"—*clocked 10,273 hours of on-air service before the tube eventually was retired.*

RCA-6166 is just ONE of the many RCA power types now paying extra dividends to broadcast and television stations throughout the industry—in terms of lower capital investment per hour of tube performance—lower station operating costs—and minimum equipment "outage."

Your RCA Tube Distributor can fill all your broadcast tube requirements promptly.

HOW TO GET MORE HOURS FROM AN RCA-6166

- Maintain filament voltage at 5 volts—right at tube terminals.
- Keep air-cooling system clean—to prevent tube and circuit damage from overheating.
- If power amplifier uses spring finger socket contacts, make sure each finger is clean—and has ample tension for good contact (to prevent arcing).
- Handle RCA-6166 *carefully* to avoid damage through mechanical shock.
- Operate RCA-6166 within RCA ratings; Follow instructions packed with each tube.
- Operate spare tubes periodically.
- Test each RCA-6166 in actual operation as soon as you receive it.

TUBES FOR TELECASTING

RADIO CORPORATION OF AMERICA, HARRISON, N. J.