



TUBE TIPS



A NEWSLETTER TO THE BROADCASTING INDUSTRY

RCA TUBE DIVISION

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Four-Month Period Sees Many New RCA Camera Tube Developments

Broadcasters will be interested in noting the many new achievements in TV camera tubes, by the RCA Tube Division, during the last four months, the latest being a developmental Vidicon industrial-TV camera tube featuring an improved tipless structure. This tipless structure allows the use of a longer deflecting yoke than is permitted with a side-tip structure. The longer yoke offers the advantages of less deflecting power, and a narrower deflecting angle which effectively reduces deflection distortion and improves center-to-edge focus of the scanning beam. Production of this new developmental tube is planned for 1957.

Another Vidicon which was recently introduced as a commercial design is the RCA-6326-A for use in compact color-TV cameras using the method of simultaneous pickup of film subjects. With a resolution of about 600 television lines, this tube can provide a picture of high quality for broadcasting applications. The advantages of the 6326-A are similar to the developmental industrial-TV Vidicon mentioned above, in that the 6326-A also utilizes a tipless structure.

The "eye" of a highly miniaturized, transistorized RCA TV camera and portable transmitter is another developmental RCA Vidicon camera tube. It is only $\frac{1}{2}$ -inch in diameter and 3 inches in length. The new tube has a photo-surface sensitivity which is greater than that of the present 1-inch diameter Vidicon camera tube commonly used in present portable TV cameras.

RCA engineers have designed a developmental image-orthicon tube intended for use in industrial and scientific-research television applications involving extremely low light levels. This new tube is capable of producing signal information when its photo-cathode is subjected to an illumination of as little as one one-hundred-thousandth of a foot-candle. Commercial production of this tube is planned for 1957.

To climax the recent developmental announcements, RCA Micro-Mesh, a 750-mesh screen, has replaced the 500-mesh screen formerly used in the image-orthicon types RCA-5820 for black-and-white and the RCA-6474/1854 for three-tube color cameras. The new screen eliminates mesh pattern and moiré effects. Micro-Mesh improves picture-detail contrast and is particularly effective in color cameras. It also minimizes the beat pattern between the color sub-carrier and the frequency generated by the scanning beam.



Another Broadcaster Reports on Economy of RCA-6166 Power Tube Type

Howard L. Daubenmeyer, chief engineer of WTRF, Wheeling, W. Va., has reported that an RCA-6166 power amplifier tube used in the aural side of the station's TT-50-AH television transmitter was finally replaced after two-and-one-half years of service.



According to Mr. Daubenmeyer, WTRF's TT-50-AH transmitter, produced by RCA, was the second one of its kind to be installed anywhere in the country. And the long-life RCA-6166 was "one of the original tubes in the transmitter," the chief engineer pointed out in a recent letter.

"This tube," Mr. Daubenmeyer related, "was placed in operation March 24, 1954, and though still usable, it was retired with 15,241 hours of service."

The aural side of WTRF's transmitter is operated at a power of 16.6 Kw.

Beam Power Tubes with 12.6-Volt Heaters

The most recent addition to the RCA line of power tubes intended primarily for mobile communications equipment operating from a 12-volt storage battery is the 6893 beam power tube. It can be used as an rf power amplifier and oscillator, as well as an af power amplifier and modulator. Except for its heater, which is rated at 12.6 volts, 0.4 ampere, the 6893 is identical with the RCA-2E26 and has the same technical data exclusive of IMS conditions. In class C telegraph service at frequencies up to 125 Mc, the 6893 can deliver 20 watts (CCS) at a plate voltage as low as 400 volts, or 27 watts (ICAS) at 600 volts, with a driving power at the tube of only about 0.2 watt.

Other RCA types for use in 12-volt storage-battery-operated mobile equipment are the 6417, 6850, and 6883.

The RCA-6417 is a miniature beam power tube especially useful as an rf power amplifier, frequency multiplier, oscillator (VFO or crystal), and VHF driver tube for larger tube types. It is identical with the RCA-5763 except for its heater rating of 12.6 volts, 0.375 ampere. In unmodulated cw service, at frequencies up to 30 Mc, the 6417 can deliver about 10 watts (CCS) at a plate voltage of 300 volts, or 12 watts (ICAS) at 350 volts, with a driving power at the tube of only about 0.1 watt.

The RCA-6850 is a small twin beam power tube designed primarily for service as a push-pull rf power amplifier or as a frequency tripler in the UHF range between 450 and 470 Mc. The 6850 is identical with the RCA-6524 except for its heater rating of 12.6 volts, 0.625 ampere. Under ICAS conditions in class C telegraphy service at 462 Mc, the 6850 can deliver to the output-circuit load

a useful power of approximately 20 watts with a plate voltage of 300 volts and a driving power of about 7 watts.

The RCA-6883 – identical with the RCA-6146 except for its heater rating of 12.6 volts, 0.625 ampere – is a small beam power tube for use as an rf power amplifier and oscillator, as well as an af power amplifier and modulator. As an unmodulated power amplifier in class C service at 175 Mc, the 6883 can deliver a power output of 25 watts (CCS) at a plate voltage of 320 volts, or 35 watts (ICAS) at 400 volts, with a driving power at the tube of only about 3 watts.

Four Booklets Feature Valuable Data on over 2,000 RCA Tube Types

Four recently published RCA booklets will provide broadcasters with information on power and gas tubes; receiving tubes for radio and television broadcasting; photosensitive and cathode-ray tubes; and interchangeability of industrial-type tubes.

The revised edition of the "RCA Power & Gas Tubes" booklet (Form PG-101C) contains 24 pages of technical data on 175 tube types including vacuum power tubes, rectifier tubes, thyatrons, ignitrons, magnetrons, and vacuum-gauge tubes. The tubes are covered by brief text descriptions, charted dimensions, ratings, operating values, and base or terminal-connection diagrams.

The 28-page "RCA Receiving Tubes for AM, FM, and Television Broadcast" booklet (Form 1275-G) features a complete reference guide on all RCA receiving tubes and picture tubes, including characteristics of more than 600 types. A picture-tube chart lists and describes 75 types. Base and envelope connection diagrams are included. A classification chart permits quick determination of the type designations of RCA picture tubes according to envelope size, focus method, and deflection method, and the type designations of other RCA receiving tubes according to their functions and filament or heater voltages.

"RCA Photosensitive Devices and Cathode-Ray Tubes" (Form CRPD-105) is a 24-page booklet containing technical data on 45 phototube types, 6 camera-tube types, and 56 cathode-ray tube types. Each type is covered by text description, tabular data, and socket-connection diagram. The phototube section lists single-unit, twin-unit, and multiplier types, with spectral-response characteristic curves and dimensional outlines. The camera-tube section shows spectral-response curves for iconoscopes, image orthicons, and vidicons. The cathode-ray tube section includes oscillograph types; transcriber, monitor, and projection kinescopes; flying-spot types; monoscopes; and computer storage types. Phosphor types used in these tubes are also described.

The "RCA Interchangeability Directory of Industrial-Type Electron Tubes" (Form ID-1020A) lists 2,000 type designations of 26 manufacturers. The RCA direct replacement type or similar type, whichever is available, is shown for each listing. Tube types include vacuum power tubes, vacuum and gas rectifiers, thyatrons, ignitrons, magnetrons, cold-cathode (glow-discharge) tubes, photo-tubes, oscillograph tubes, camera tubes, and receiving-type tubes for industry and communications.

Request copies of these booklets from your local RCA tube distributor or write to RCA Commercial Engineering, 415 S. 5th St., Harrison, N. J. The booklets are only 20¢ each.



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