RCA TUBE TIPS

A NEWSLETTER TO THE BROADCASTING INDUSTRY

RCA TUBE DEPARTMENT. HARRISON, N. J.

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World's Most Powerful Radio Transinitter Features RCA-5831 Beam Triodes

The world's most powerful radio transmitter went into operation recently at Jim Creek Valley in the Cascade mountains near Seattle, Wash., when for the first time in the nation's history the United States Navy was able to flash simultaneously a wireless message around the world directly to all its ships and naval units.

The message, from Admiral Robert B. Carney, Chief of Naval Operations, was tapped out in the wireless code by Brigadier General David Sarnoff, Chairman of the Board of the Radio Corporation of America. Within minutes of the first transmission, acknowledgments of receipt were relayed back from the flagships of the Atlantic and Pacific fleets, from naval aircraft, from Arctic outposts, and from submarines beneath the surface. Similarly, RCA Communications, with its 89 circuits in 65 nations, reported acknowledgments from strategic far-away places.

A six-year project of the Navy and RCA, the giant radio station was constructed to provide the Navy, for the first time, with instantaneous communications with fleet units everywhere. Its output is more than twice that of any existing military transmitter and 22 times greater than any commercial station.

"Heart" of the transmitter equipment are four RCA-5831's. Each 5831 is a water-cooled beam triode of unique design capable of generating several hundred kilowatts of power at high efficiency with exceptionally low driving power. It is intended primarily for use as a class C rf power amplifier, either modulated or unmodulated, but is also useful as a class B af power amplifier and modulator. In unmodulated class C service, the 5831 has a maximum plate voltage rating of 16,000 volts, a maximum plate input of 650 kw, and a maximum plate dissipation of 150 kw. It can be operated with maximum rated plate voltage and plate input at frequencies up through the "Standard Broadcast Band" and much higher.

The 5831 is unique in that it features a symmetrical array of unit electron-optical systems embodying a mechanical structure which permits close spacing and accurate alignment of the electrodes to a degree unusual in high-power tubes. Ducts for water cooling the plate and the beam-forming cylinder are built in and have simplified hose connections. The grid-terminal flange requires a water-cooled connector. Because of the electron-optical principles incorporated in its design, the 5831 has low grid current and hence requires less than 2 kw of driving power.

Other features of the 5831 include a multistrand thoriated-tungsten filament for economical operation as well as high emission capability, low-inductance rf leads and flange terminals, and compactness – features contributing to the overall suitability of the 5831 in high-efficiency, high-power applications.

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New UHF 'Pencil Tubes' with External Plate Radiators Announced by RCA

Two small UHF triodes – the first in RCA's unique "pencil-tube" family to feature external plate radiators – were recently announced. Identified as RCA types 6263 and 6264, these new tubes are designed for use in low-power mobile transmitters and in aircraft transmitters at altitudes up to 60,000 feet without pressurized chambers. They have a maximum plate-dissipation rating of 13 watts (ICAS) and can be operated with full ratings at frequencies as high as 1700 Mc. The 6263 has a mu of 27; the 6264 has a mu of 40.

Type 6263 is intended for service as an rf power amplifier and cw oscillator. When operated in cathode-drive circuit under ICAS conditions at a frequency of 500 Mc, this tube can deliver a power output to the load of approximately 10 watts as an unmodulated class C rf power amplifier or 7 watts as an unmodulated class C oscillator, with a plate input of only 14 watts.

Type 6264 is intended for service primarily as a frequency multiplier but may be used as an rf power amplifier and cw oscillator. When operated as a frequency tripler to 510 Mc in cathode-drive circuit under ICAS conditions, this tube can deliver a power output to the load of approximately 3.4 watts.

While retaining the basic "pencil-type" construction with its many desirable features which make a good UHF tube, RCA's 6263 and 6264 are provided with an efficient, nine-fin radiator for cooling the plate by convection or, in confined places, with forced air.

Suggested User Price of the RCA-6263 and-6264 is $24.50 each.

Color Television Key Subject of Technical Seminar

Comlpete technical information on color television equipment to enable broadcasters to transmit compatible color TV programs was disclosed for the first time to the nation's leading broadcast engineering consultants during a two-day seminar held recently in Camden, N. J. RCA engineers and executives conducted the discussions and demonstrated some of the new equipment to acquaint this group of 50 consultants with RCA developments in broadcast equipment for compatible color TV.

Of outstanding significance to broadcast engineers was a demonstration of a method, still in the developmental stage, of providing programs in color from color film. The system utilizes three recently-developed small RCA vidicon camera tubes and mirrors used in conjunction with a standard black-and-white 16mm TV film projector.

The consultants were welcomed to the seminar's opening session by W. W. Watts, vice president in charge of RCA technical products, and T. A. Smith, vice president in charge of the company's Engineering Products Department.

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"These significant developments in equipment for color television broadcasting are being shown for the express purpose of disclosing to the broadcast industry just what we are doing in the field of compatible color," Mr. Smith told the consultants. "This is in keeping with RCA's public service policy of making available to all segments of the industry the company's 'know-how' in compatible color television, just as it did in black-and-white television."

In the past six years, RCA has conducted 17 seminars on black-and-white TV which have been attended by more than 1500 engineers and consultants representing television stations and all networks across the country. Similar clinics in compatible color techniques and equipment will be scheduled by the company for broadcasters in the near future.

Shortly before the recent two-day technical seminar, RCA announced that it will begin delivery this month of the first items of compatible color TV equipment. These items, consisting of color monitors and terminal apparatus to be added to existing TV transmission equipment, will enable stations across the nation to telecast color programs received over telephone circuits.

RCA color TV cameras and other equipment necessary for origination of color television programs in the stations' own studios will be ready for delivery beginning in March, 1954. Included are cameras for "live" broadcasts, slide and film equipment, and accessories. All of this equipment has already been fully tested during extensive experimental operations.

Long Life Records Set by RCA Types 5761 and 5762/7C24

Two more instances of long life records set by RCA power tubes in broadcast service were recently reported by Robert A. Fox, chief engineer at WGAR, Cleveland, and Robert E. Miller, assistant chief engineer at KALB, Alexandria, La.

Mr. Fox pointed out that an RCA-5761 is still going strong after more than 40,000 hours of continuous service in WGAR's 50-kw AM transmitter.

The 5671 is a forced-air-cooled high-power triode with multistrand thoriated-tungsten filament. Born at Lancaster, Pa., in 1947, this tube went to work almost immediately for WGAR.

Mr. Miller related that an RCA-5762/7C24 used in the power amplifier stage of KALB's BTT-3B FM transmitter "went bad" after a total of 28 months or 15,851 hours of continuous service.

Manufactured at Lancaster, the 5762/7C24, a forced-air-cooled power triode designed for TV, AM, FM, and industrial services, was initially installed at KALB on June 8, 1951. It "died" October 8th of this year.

If you know of any long life stories about RCA power tubes, kindly write to RCA TUBE TIPS, 415 S. 5th St., Harrison, N. J.

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Season's Greetings

to our friends in the Broadcast Industry

from the RCA Tube Department

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