

HAM TIPS

from



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NEW HIGH-POWER TRIODE HAS BROAD FIELD OF USES

RCA-8000 is Rated at 620 Watts Input (ICAS) for CW Service

RCA-8000 is the new outstanding high-power triode added to the line of famous RCA Air-cooled transmitting tubes. Special feature of the tube is its construction which provides high insulation resistance between electrodes. This design enables the tube to withstand high peak voltages.

Mu Lower Than 810

Similar in appearance to the popular 810, the 8000 also has a similar maximum plate dissipation of 150 watts (ICAS) but has a lower mu of 16.5. Grid-driving requirements also are lower than the 810. RCA-8000 is particularly suitable for use as an r-f amplifier and class B modulator. Because of its high permeance, it can be operated at high plate efficiency with low driving power and relatively low plate voltage. Two 8000's in class C telegraph service (ICAS) will take a power input

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POWER PLUS



Rated at 275 ma. and 2250 volts (ICAS) and with internal construction designed for higher-than-ordinary voltages, RCA-8000 stands ready to take it in any field. Amateur Net Price is only \$13.50.

SIMPLE CURVES MAKE CORRECT RECTIFIER FILTER DESIGN EASY

Unique Method By RCA Engineers Safeguards Rectifier Tubes, Predetermines Ripple

Rectifier filters are often a neglected part of a transmitter—bogy-men of the shack. It isn't that there is a dearth of information on the subject of filters. Quite the reverse is true—and that is often the hitch. By the time a fellow has waded through the volumes of engineering treatises on filters, combed popular articles on

LC ratios, peak currents, ripple voltages and swinging chokes, the chances are he will have given up in despair and reach once again for his old reliable "brute-force" smoother.

In the curves, page 2, RCA engineers have gone a long way toward taking the fuss and muss out of rectifier filter design problems. To use these curves, it is only necessary to decide how much ripple voltage you wish to tolerate in the output, then pick from the curve a suitable combination of choke and condenser values that will meet this requirement. The LC combination you chose automatically limits to a safe value the peak plate current and average plate current flowing through the rectifier tubes. Moreover, it pre-

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DID YOU KNOW THAT . . .

The filaments of RCA battery-operated tubes are finer than a pin point? For example, filament diameter of the RCA-958 Acorn tube is approximately 0.001 inch—that of the 957 and 959 Acorns, only 0.0006 inch!

W3BKX/3 USING RCA TUBES WINS FIELD DAY CONTEST

Frankford Radio Club Xmtrs Feature 807's and VR-150's

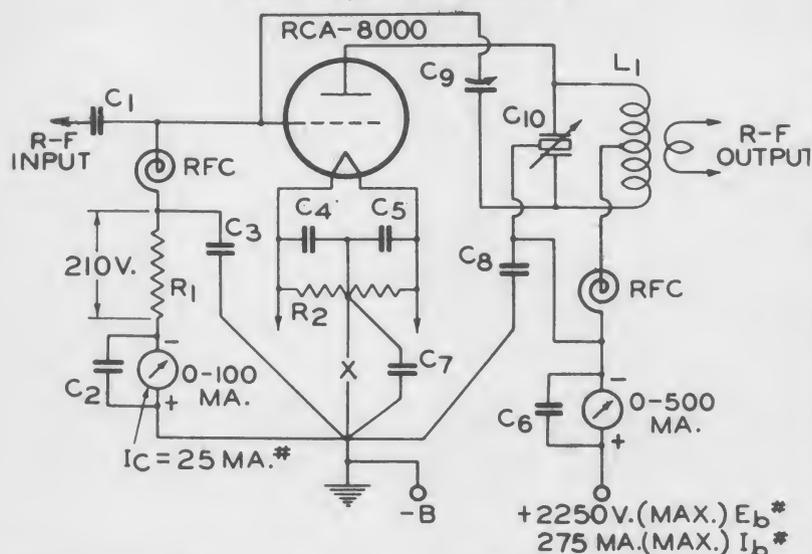
For the second consecutive issue of Ham Tips, we can boast with pardonable pride to the fact that the winner of major national contest used RCA tubes—and plenty of them. The Frankford Radio Club of Philadelphia, operating under the call of W3BKX/3 gathered in 8406 points with 601 contacts during the 1940 A.R.R.L. Field Day jamboree. This is a record if ever there was one. Congratulations, F. R. C. During the 26 hours of contest in which the seven stations of the club were on the air nearly continuously, every one of the 43 RCA tubes gave 100% uninterrupted service.

The tube line-ups in the seven transmitters at W3BKX/3 are straightforward. They signify that careful planning contributed in no

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R-F POWER AMPLIFIER USING RCA-8000

Power Output 475 Watts, ICAS



C₁=0.0005 μf, mica, 1500 v.
C₂ to C₆=0.002 μf, mica
C₇=0.002 μf, mica, 2500 v.
C₈=0.002 μf, mica, 5000 v.
C₉=4.8 μf (approx.), 7500 v.
C₁₀=0.75 μf/meter/section†

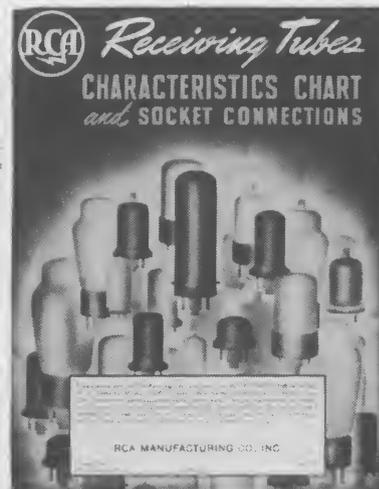
R₁=8400 ohms, 20 watts
R₂=50 ohms, c.t., wire-wound
L₁=Select for band desired
RFC=R-f choke
X=Insert keying relay here

† Approximate capacitance in actual use at resonance.

* For ICAS plate-modulated telephony service, reduce E_b to 1800 v., I_b to 250 ma., and decrease I_c to 20 ma. The power output is approximately 335 watts.

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YOURS FOR THE ASKING



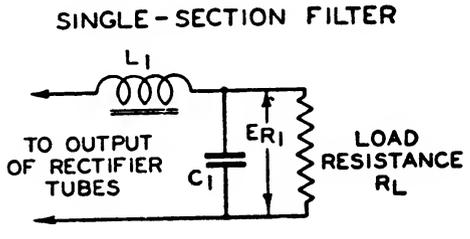
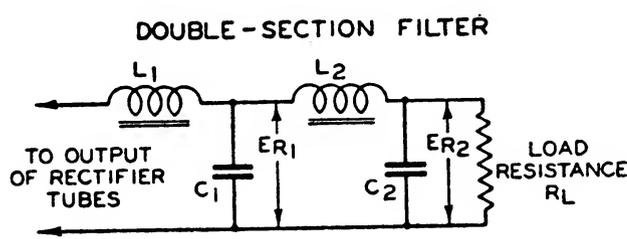
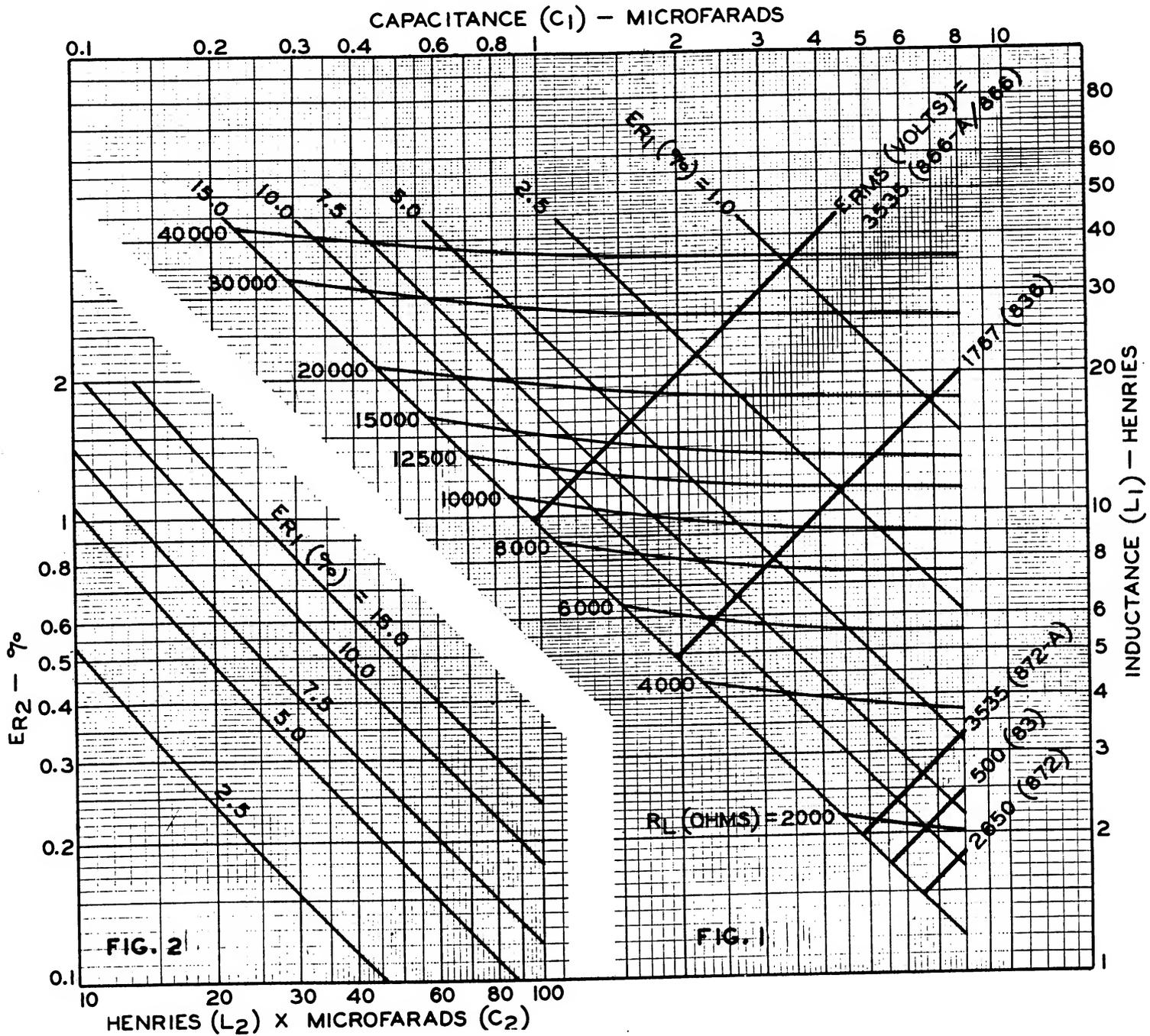
A brand new 16-page Receiving Tube Chart is now available for amateurs, servicemen, and engineers. This chart, known as the 1275-B, contains the salient characteristics, socket connections, and a special classification index of the complete line of RCA receiving tubes, including the famous Miniature types. Ask your RCA tube dealer or write to the Commercial Engineering Section of the RCA Manufacturing Co., Inc., Harrison, N. J. for your copy.

FILTER DESIGN CURVES

For Full-Wave, Single-Phase Circuits Only—60-Cycle Sine-Wave Supply

(When the supply is a 50-cycle source, multiply the selected values of inductance and capacity by 1.2.
When the supply is a 25-cycle source, multiply the filter values by 2.4.)

Fig. 1—Curves for choice of filter values for (1) the first section of a double-section filter, or (2) a single-section filter.
Fig. 2—Curves for choice of filter values for second section of a double-section filter.



E_{RMS} = Maximum volts (RMS) per plate applied to rectifier tube.
 R_L = Load Resistance.
 E_{R1} = Per cent ripple in D-C output voltage from (1) the first section of a double-section filter, or (2) a single-section filter.
 E_{R2} = Per cent ripple in D-C output voltage from second section of a double-section filter.

HAM TIPS from RCA

New High-Power Triode Has Broad Field of Uses

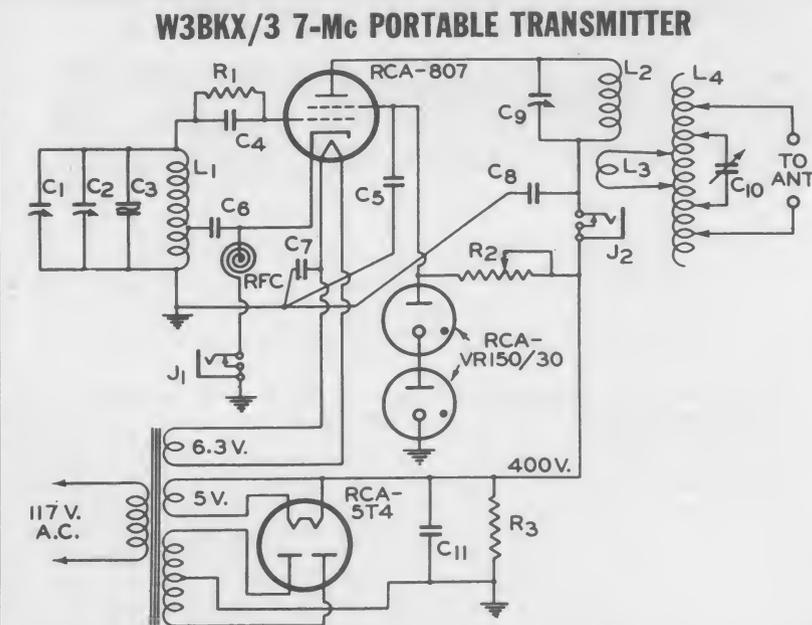
(Continued from page 1, column 1)

of 1240 watts and require only 18 watts of driving power. In class B modulator service, two 8000's will modulate 100% nearly 1½ kilowatts of power.

In self-rectifying oscillator circuits, such as are used in therapeutic applications, two 8000's are capable of delivering a useful power output of 550 watts (85% circuit efficiency). In this application, as well as in general radio transmitter applications, the 8000 may be operated at maximum ratings at frequencies as high as 30 Mc and with reduced plate voltage and input as high as 100 Mc.

RCA-8000 is designed with a heavy-duty 45-watt filament which is shielded at each end. This feature increases power output by eliminating losses from bulb bombardment and stray electrons. The tube has a large graphite anode, specially processed, to insure high thermal radiation and a minimum of gas. The plate and grid leads are brought out to rugged terminals at the top and side of the bulb respectively. This design provides very low lead inductance and permits compact circuit layout for r-f installations.

A typical single-ended r-f amplifier circuit using the 8000 is shown on p. 1. Keying is shown in the filament-to-ground return lead. If it is desired to key the oscillator for break-in operation, a fixed bias of -90 volts should be used in conjunction with a grid leak (R₁) of about 5000 ohms (10 watts). This amount of fixed bias will protect the 8000 against removal of grid excitation when the key is open. An RCA-809 operated at reduced ratings or an 807 is suitable for the driver stage. For 10-meter operation with an 80-meter crystal, a practical tube line up is an 807 or 6L6 "Tritet" crystal oscillator-quadrupler, an 807 buffer-amplifier and an 809 doubler. The 809 is needed only for 10-meter operation; it may be omitted for the other bands. With a 10-meter crystal and a 6J5-G triode



C₁=35 μf, Max. (Main tuning cond.)
 C₂=Air-padder, 235 μf, Max.
 C₃=65 μf, fixed (Neg. Coeff. Type)
 C₄=0.0001 μf, mica
 C₅ C₆ C₇ C₈=0.01 μf, mica
 C₉=100 μf, max.
 C₁₀=140 μf, max.
 C₁₁=40 μf, electrolytic
 R₁=18,000 ohms, 2-watt
 R₂=5,000 ohms, 25-watt

R₃=90,000 ohms, 10-watt
 L₁=Tuned to 3.5 Mc. 16 Turns No. 16 B. & S. on 1½" form winding length, 1½". Cathode tapped 4 turns above ground.
 L₂=Same as L₁ but without tap.
 L₃=3 turns No. 24 enamel wound between lower turns of L₂
 L₄=B. & W. type 40-B. 20 turns
 J₁=Key jack
 J₂=Plate-meter jack
 RFC=2.5 mh. choke

oscillator, an 807 can be used to drive the 807 directly, thereby providing a 3-stage, 10-meter transmitter of respectable power output. This r-f amplifier circuit may also be plate modulated by reducing the d-c plate voltage to 1800 volts and the d-c plate current to 250 ma. These are ICAS values.

With its relatively low plate-voltage requirement for high power output, RCA-8000 is ideal for use in radio transmitter installations as well as being a logical choice in self-rectifying oscillator circuits such as are often used in therapeutic applications. Priced at a net of \$13.50 it offers economy not only in initial tube cost but also in cost of the final-stage tank condenser, the high-voltage power supply, and the number of exciter stages required.

For additional technical information on the RCA-8000, write to the Commercial Engineering Section, Harrison, N. J.

RCA-8000 TENTATIVE CHARACTERISTICS and RATINGS

FILAMENT VOLTAGE (A.C. or D.C.)	10	Volts
FILAMENT CURRENT	4.5	Amperes
AMPLIFICATION FACTOR	16.5	
DIRECT INTERELECTRODE CAPACITANCES:		
Grid-Plate	6.4	μf
Grid-Filament	5.0	μf
Plate-Filament	3.3	μf

As R-F Power Amplifier—Class C Telegraphy

Key-down conditions per tube without modulation

	CCS	ICAS	
D-C PLATE VOLTAGE	2000 max.	2250 max.	Volts
D-C GRID VOLTAGE	-500 max.	-500 max.	Volts
D-C PLATE CURRENT	250 max.	275 max.	Ma.
D-C GRID CURRENT	40 max.	40 max.	Ma.
PLATE INPUT	500 max.	620 max.	Watts
PLATE DISSIPATION	125 max.	150 max.	Watts
TYPICAL OPERATION:			
D-C Plate Voltage	2000	2250	Volts
D-C Grid Voltage:			
From a fixed supply of	-195	-210	Volts
From a grid resistor of	8100	8400	Ohms
From a cathode resistor of	710	700	Ohms
Peak R-F Grid Voltage	370	400	Volts
D-C Plate Current	250	275	Ma.
D-C Grid Current (Approx.)	24	25	Ma.
Driving Power (Approx.)	8	9	Watts
Power Output (Approx.)	375	475	Watts

The license extended to the purchaser of tubes appears in the License Notice accompanying them. Information contained herein is furnished without assuming any obligation.

W3BKX/3 Using RCA Tubes Wins Field Day Contest

(Continued from page 1, column 3)

small way to the final success of the club. The line-ups are as follows:

Transmitter No. 1—1.8-Mc Phone
 RCA-802 electron-coupled oscillator, RCA-807 final amplifier, RCA-56's speech amplifier, RCA-46's class B modulator. RCA-83 and RCA-5Z3 rectifiers. Input to final, 20 watts.

Transmitter No. 2—3.5 to 3.6-Mc CW
 RCA-6L6 crystal or electron-coupled oscillator, RCA-807 final amplifier, 2 RCA-VR-150's as ECO voltage regulators, RCA-83 rectifier. Input to final, 30 watts.

Transmitter No. 3—3.6 to 3.9-Mc CW
 RCA-6AG7 electron-coupled oscillator, RCA-807 final amplifier, 2 RCA-VR-150's as ECO voltage regulators, 2 RCA-6X5G rectifiers. Input to final, 30 watts.

Transmitter No. 4—7.0 to 7.15-Mc CW
 RCA-807 electron-coupled oscillator, 2 RCA-VR-150's as ECO voltage regulators, RCA-5T4 rectifier. Input, 30 watts.

Transmitter No. 5—7.15 to 7.3-Mc CW
 RCA-807 electron-coupled oscillator, 2 RCA-VR-150's as ECO voltage regulators, 2 RCA-6X5G rectifiers. Input, 27 watts.

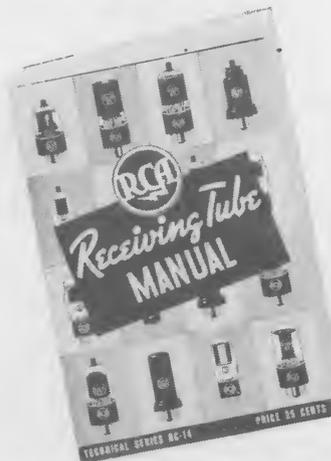
Transmitter No. 6—14-Mc CW
 RCA-802 electron-coupled oscillator, RCA-VR-105 and RCA-VR-150 as ECO voltage regulators, 2 RCA-6X5G rectifiers. Input, 27 watts.

Transmitter No. 7—28- and 56-Mc Phone
 RCA-6L6 tritet oscillator, RCA-6L6 doubler, RCA-807 final amplifier, 2 RCA-6L6 modulators, and 2 RCA-5Z3 rectifiers. Input, 30 watts.

AR-77 PRICES REVISED

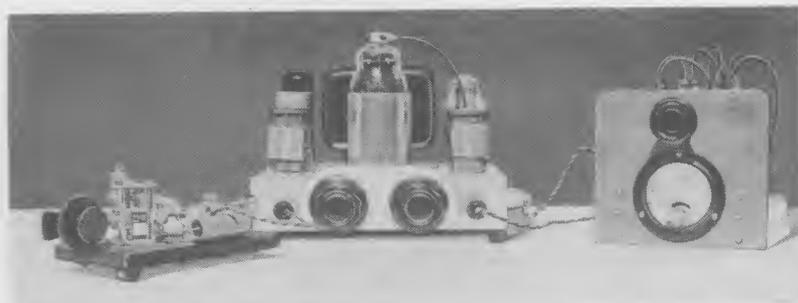
Markedly improved design together with increased manufacturing costs necessitates a slight revision of prices on the new-production AR-77's. Beginning March 1, Amateur Net Prices are: AR-77 only, \$162.50; AR-77 with 8" Table. Speaker, \$170.50; AR-77 with Extended-Range Speaker Mi-8314-A, \$177.50.

MODERNIZED



21 more pages and 40 new tube type descriptions have just been added to the RC-14. This book is now a virtual encyclopedia of receiving tubes, containing 240 pages covering 283 different receiving tube types. An up-to-date RC-14 may be obtained from your RCA tube dealer, or by sending 25 cents to the Commercial Engineering Section, RCA Manufacturing Company, Inc., Harrison, N. J.

PRIZE-WINNING PORTABLE



W3BKX/3's transmitter for the 7000-7150 kc. channel consists of an 807 as E.C.O. Self-contained power supply uses a 5T4 rectifier and two VR-150 voltage regulator tubes. Size of the chassis is only 7" x 9" x 2". Antenna coupler is shown to the right of the photograph. Circuit appears above.