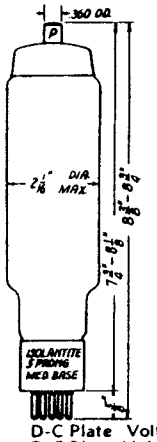
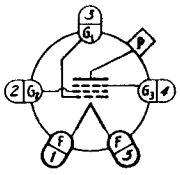


TETRODE POWER AMPLIFIER OSCILLATOR

The RK-47 is a beam type aligned grid tetrode having a thoriated tungsten filament, a hard glass bulb and an isolantite base. The use of aligned grids reduces the ratio of screen current to plate current and allows more efficient utilization of the total space current. The deflector plates in the RK-47 are connected to base pin #4 which should be connected to the filament center-tap.



BOTTOM VIEW OF SOCKET

FILAMENT RATING

Filament Voltage	10	volts
Filament Current	3.25	amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.12	μμf
Input	13	μμf
Output	10	μμf

R-F POWER AMP. OR OSC.—CLASS C

MAXIMUM RATINGS

D-C Plate Voltage—Telegraphy	1250	volts
D-C Plate Voltage—Telephony		
With Control Grid Modulation	1250	volts
With Plate or Plate & Screen Modulation	900	volts
D-C Screen Voltage	300	volts
D-C Plate Current	150	ma
D-C Control Grid Current	10	ma
R-F Control Grid Current	5	amp
Plate Dissipation	50	watts
Screen Dissipation	10‡	watts

TYPICAL OPERATION

	Telephony Control Grid Modulation	Telephony Plate Only Modulation	Telephony Plate & Screen Modulation	Telegraphy	
D-C Plate Voltage	1250	900	900	1250	volts
D-C Screen Voltage	300	300	250	300	volts
D-C Control Grid Voltage	—135	—100	—120	—70	volts
D-C Plate Current	60	80	90	138	ma
D-C Screen Current	9	50	23	14	ma
D-C Con. Grid Current	1.6	10	7.5	7	ma
Screen Resistor	—	12000†	28000‡	—	ohms
Peak R-F Input Voltage	155	160	180	160	volts
R-F Driving Power	1.43*	1.5	1.2	1.0	watts
Carrier Power Output	28.5	50	55	120	watts
Peak A-F Volt.—Plate	—	900*	900*	—	volts
Peak A-F Volt.—Grid	40 *	—	250*	—	volts
A-F Modulating Power	0.37*	36	51	—	watts
Peak Power Output	114 *	200*	220*	—	watts

‡15 watts allowable if average plate dissipation does not exceed 40 watts.
*At the peak of the a-f cycle with 100% modulation.
†Connected direct to plate supply voltage and by-passed for r.f. only.
‡Connected to plate end of modulation trans. and by-passed for r.f. only.

R-F POWER AMPLIFIER—CLASS B—TELEPHONY

MAXIMUM RATINGS

D-C Plate Voltage	1250	volts
D-C Screen Voltage	300	volts
D-C Plate Current (Carrier)	75	ma
Plate Dissipation (Carrier)	50	watts
Screen Dissipation (Carrier)	10	watts

TYPICAL OPERATION

D-C Plate Voltage	1250	volts
D-C Screen Voltage	300	volts
D-C Grid Voltage	—30	volts
D-C Plate Current	60	ma
D-C Screen Current	2	ma
D-C Grid Current	0.9	ma
Peak R-F Input Voltage	90 *	volts
R-F Driving Power	4 *	watts
Carrier Power Output	25	watts
Peak Power Output	100*	watts

*At the peak of the a-f cycle with 100% modulation.

OPERATING NOTES

FREQUENCY RANGE

The RK-47 may be operated at the maximum ratings at frequencies up to 30 megacycles. Above 30 megacycles the reduced efficiency realized requires that the plate voltage be lowered to a maximum of 900 volts to prevent the plate dissipation from exceeding the maximum rated value. The operation of the tube at frequencies higher than 60 megacycles is not recommended.

EXCITATION

The Class C amplifier characteristic curves show the power output, plate current and screen current plotted vs. excitation as denoted by the d-c control grid current in milliamperes. The power output flattens off around 7 or 8 ma. of grid current with very little gained above these values. The screen dissipation increases with excitation and for this reason the excitation should be kept at a reasonable value.

SHIELDING

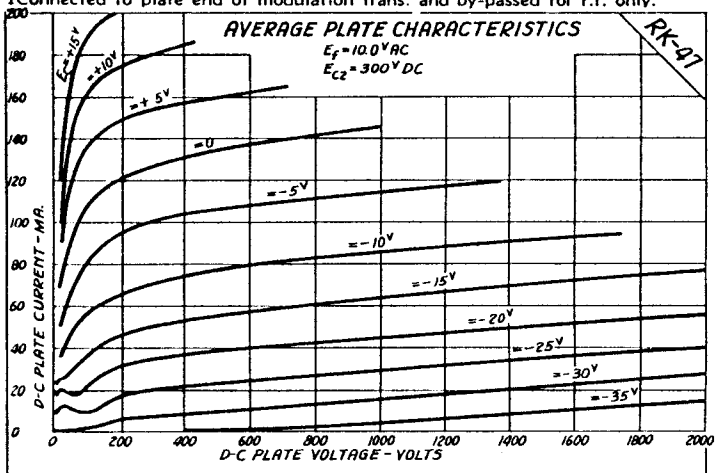
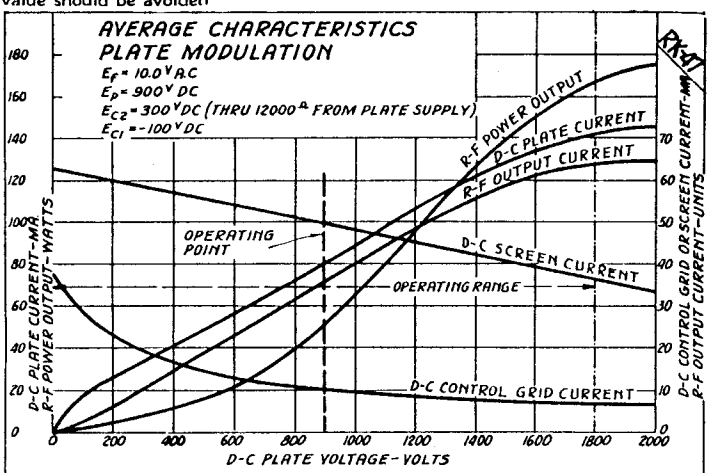
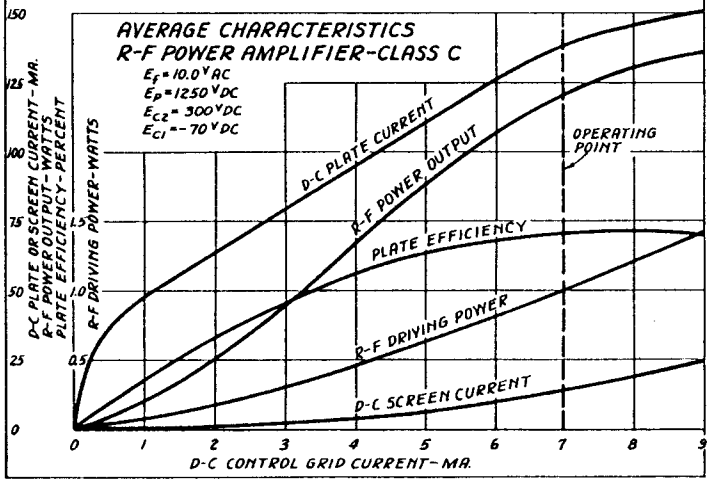
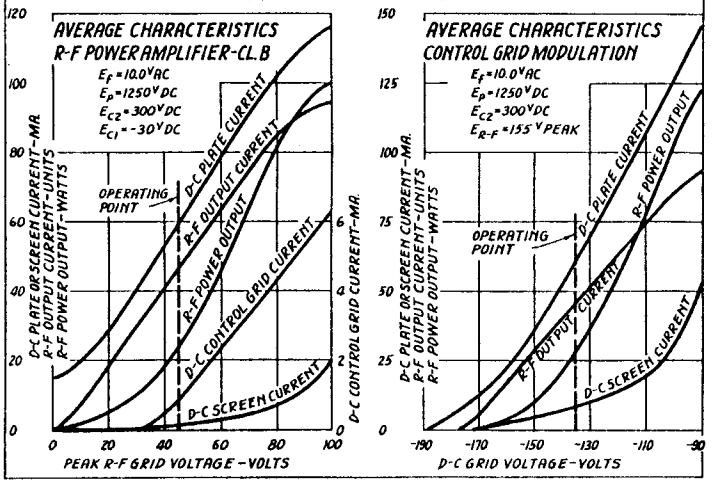
Shielding of the grid input tuning system from the plate tuning apparatus is desirable and will provide improved stability. If a shield is applied to the RK-47, it should enclose the base and extend to the lower internal shield and should clear the glass bulb by at least 1/16".

BIAS

At least 25 volts of fixed bias should be used with 1250 volts on the plate to protect the tube in case of failure of the bias or excitation. Additional bias may be obtained by the use of a grid or cathode resistor.

CRYSTAL OSCILLATOR

The RK-47 is not recommended for use as a crystal controlled oscillator.

PLATE TEMPERATURE

The plate of the RK-47 will show a dull cherry red color (See Plate Temperature Color Scale) at the center of the plate, if viewed in the dark, when operated at the maximum rated plate dissipation. Dissipations above the rated value should be avoided