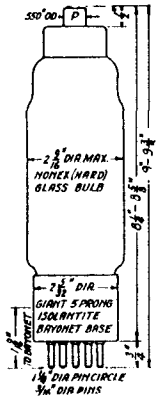
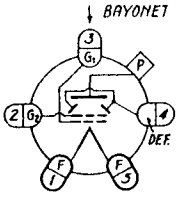


TETRODE POWER AMPLIFIER OSCILLATOR

The RK-48 is a beam type aligned grid power amplifier tube having a thoriated tungsten filament, a molybdenum plate, 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-48 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	5	amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.13	μμf
Input	17	μμf
Output	13	μμf

R-F POWER AMP. OR OSC.—CLASS C

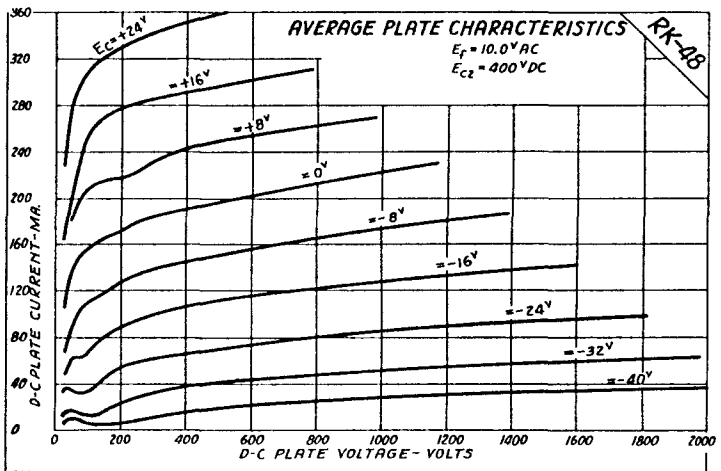
MAXIMUM RATINGS

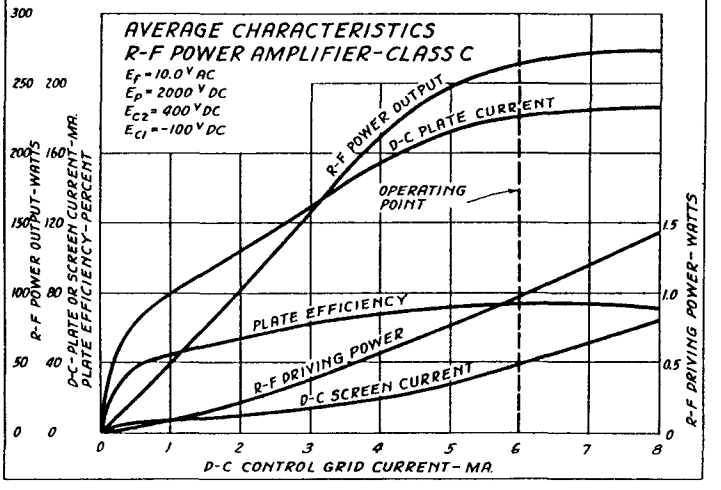
D-C Plate Voltage—Telegraphy	2000	volts
D-C Plate Voltage—Telephony		
With Control Grid Modulation	2000	volts
With Plate or Plate & Screen Modulation	1500	volts
D-C Screen Voltage	400	volts
D-C Plate Current	180	ma
D-C Control Grid Current	25	ma
R-F Control Grid Current	8	amp
Plate Dissipation	100	watts
Screen Dissipation	22	watts

TYPICAL OPERATION

	Telephony Control Grid Modulation	Telephony Plate Only Modulation	Telephony Plate & Screen Modulation	Telegraphy	Telegraphy	
D-C Plate Voltage	1500	2000	1500	1500	2000	volts
D-C Screen Voltage	400	400	400	400	400	volts
D-C Con. Grid Voltage	—145	—155	—100	—100	—100	volts
D-C Plate Current	77	74	148	156	180	ma
D-C Screen Current	10	8	50	31	40	ma
D-C Con. Grid Current	1.5	0.9	6.5	6.0	6.5	ma
Screen Resistor	—	—	22000†	35000‡	—	ohms
Peak R-F Input Voltage	162	167	165	160	170	volts
R-F Driving Power	1.6 *	1.05*	1.0	0.9	1.0	watts
Carrier Power Output	40	50	165	175	250	watts
Peak A-F Volt.—Plate	—	—	1500*	1500*	—	volts
Peak A-F Volt.—Grid	45 *	45 *	—	400 *	—	volts
A-F Modulating Power	0.45*	0.28*	115	140	—	watts
Peak Power Output	160 *	200 *	660 *	700 *	—	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	2000	volts
D-C Screen Voltage	400	volts
D-C Plate Current (Carrier)	100	ma
Plate Dissipation (Carrier)	100	watts
Screen Dissipation (Carrier)	10	watts

TYPICAL OPERATION

D-C Plate Voltage	2000	volts
D-C Screen Voltage	400	volts
D-C Control Grid Voltage	—35	volts
D-C Plate Current	76	ma
D-C Screen Current	6	ma
D-C Grid Current	0.35	ma
Peak R-F Input Voltage	80 *	volts
R-F Driving Power	0.22*	watts
Carrier Power Output	60	watts
Peak Power Output	240 *	watts

OPERATING NOTES

FREQUENCY RANGE

The RK-48 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 1500 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 6 or 7 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

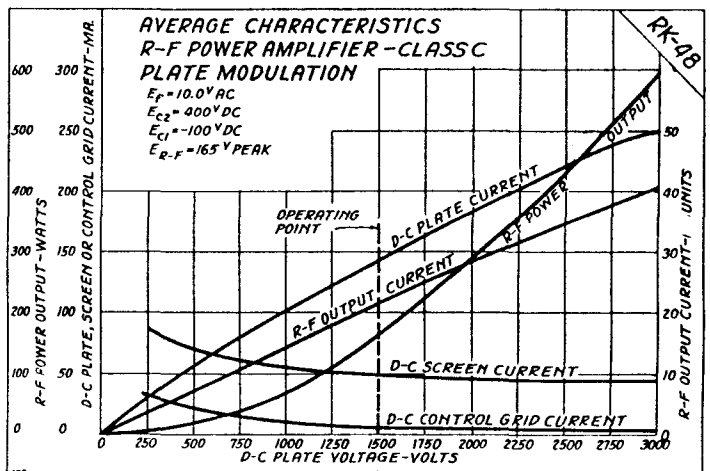
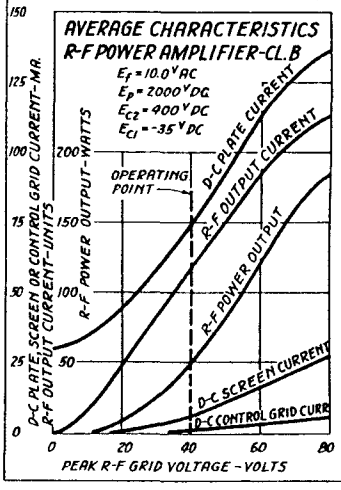
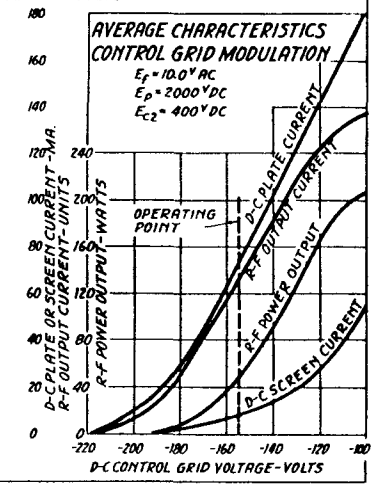
Shielding of the grid input tuning system from the plate tuning apparatus is desirable and will provide improved stability. If a shield is applied to the RK-48 it should enclose the base and extend to the lower internal shield and should clear the glass bulb by at least 1/16".

BIAS

At least 35 volts of fixed bias should be used with 2000 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-48 is not recommended for use as a crystal controlled oscillator.

PLATE TEMPERATURE

The plate of the RK-48 will show a light red color (See Plate Temperature Color Scale) when operated at the maximum rated plate dissipation. Dissipations above the rated value should be avoided.