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 insulator 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 pins #4 which should be connected to the filament center tap.

FILAMENT RATING

Filament Voltage
10 volts
Filament Current
5 amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate
0.13 μf
Input
13 μf
Output
13 μf

R-F POWER AMP. OR OSC.—CLASS C

MAXIMUM RATINGS

D-C Plate Voltage—Telephony
2000 volts
D-C Screen Voltage—Telephony
2000 volts
With Control Grid 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 Telephony Telephony Telephony
D-C Plate Voltage 1500 1500 1500 1500 2000 volts
D-C Screen Voltage 400 400 400 400 400 400 400 400 volts
D-C Control Grid Voltage 0 0 0 0 0 0 0 0 volts
D-C Plate Current 77 74 148 156 180 ma
D-C Control Grid 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 122001 135001 ohms
Peak D-F Input Voltage 162 167 165 160 170 volts
R-F Driving Power 1.6 x 1.05 x 1.0 0.9 1.0 0.9 watts
Carrier Power Output 40 50 165 175 250 watts
Peak A-F Voltage—Plate 150 150 150 150 150 volts
Peak A-F Voltage—Grid 45 45 45 45 45 volts
A-F Modulating Power 0.35 0.26 0.26 0.26 0.26 watts
Peak Power Output 160 200 660 700 700 watts

R-F POWER AMPLIFIER—CLASS B—TELEPHONE

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
15 5 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 6 volts
R-F Driving Power
20 1 watts
Carrier Power Output
60 6 watts
Peak Power Output
240 6 watts

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 1½".

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 15°C above maximum rated plate dissipation. Dissipation above the rated value should be avoided.

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RAYTHEON AMATEUR TUBES

R-F POWER AMPLIFIER—CLASS C

OPERATING NOTES

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