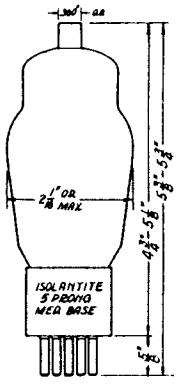
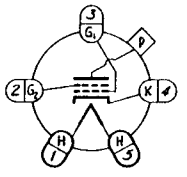
TETRODE POWER AMPLIFIER OSCILLATOR



The RK-39 and RK-41 are heater type aligned grid beam power amplifier tubes having isolantite bases. 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-39 and RK-41 are connected internally to the cathode.



BOTTOM VIEW OF SOCKET

HEATER RATING

	RK-39	RK-41	
Heater Volt.	6.3	2.5	volts
Heater Cur.	0.9	2.4	amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.2	μμf
Input	13	μμf
Output	10	μμf

R-F POWER AMP. OR OSC.—CLASS C

MAXIMUM RATINGS

D-C Plate Volt.—Telegraphy	600	volts
D-C Plate Volt.—Telephony		
With Control Grid Modulation	600	volts
With Plate or Plate & Screen Modulation	475	volts
D-C Screen Voltage	300	volts
D-C Plate Current	100	ma
D-C Control Grid Current	5	ma
Plate Dissipation	25	watts
Screen Dissipation	3.5	watts

TYPICAL OPERATION

	Telephony Control Grid Modulation		Telephony Plate Only Modulation		Telephony Plate & Screen Modulation		Telegraphy		
D-C Plate Volt	500	600	400	475	400	475	500	600	volts
D-C Screen Volt.	250	300	200	200	250	250	250	300	volts
D-C Con. Gd. Vlt.	−50	−70	−45	−45	−50	−50	−60	−90	volts
D-C Plate Current	60	60	60	65	95	85	95	93	ma
D-C Screen Current	3	3	17.5	17.5	8	9	12	10	ma
D-C Con. Grid Cur.	0.6	0.2	4.0	4.0	2.5	2.5	3	3	ma
Screen Resistor	—	—	11400†	15700†	19000‡	25000‡	—	—	ohms
Peak R-F Input Vlt.	60	78	70	70	75	75	84	117	volts
R-F Driving Power	0.5	*0.54*	0.25	0.25	0.2	0.2	0.25	0.38	watts
Carrier Pr. Output	10	12	17	21	25	26	35	36	watts
Peak A-F Vlt., Plate	—	—	400*	475*	400*	475*	—	—	volts
Peak A-F Vlt., Grid	25	*25*	—	—	250*	250*	—	—	volts
A-F Mod. Power	0.28*	0.17*	12	16	21	20	—	—	watts
Peak Pr. Output	40	*48*	*68*	*84*	100*	104*	—	—	watts

*At the peak of the a-f cycle with 100% modulation.
†Connected direct to the 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	600	volts
D-C Screen Voltage	300	volts
D-C Plate Current (Carrier)	63	ma
Plate Dissipation (Carrier)	25	watts
Screen Dissipation (Carrier)	3.5	watts

TYPICAL OPERATION

D-C Plate Voltage	600	volts
D-C Screen Voltage	250	volts
D-C Grid Voltage	−25	volts
D-C Plate Current	63	ma
D-C Screen Current	4	ma
D-C Grid Current (at 100% modulation)	9	ma
Peak R-F Input Voltage	50 *	volts
R-F Driving Power	0.4 *	watts
Carrier Power Output	12.5*	watts
Peak Power Output	50 *	watts

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

OPERATING NOTES

FREQUENCY RANGE

The RK-39 and RK-41 may be operated at the maximum ratings at frequencies up to 60 megacycles. Above 60 megacycles the reduced efficiency realized requires that the plate voltage be lowered to a maximum of 300 volts to prevent the plate dissipation from exceeding the maximum rated value. The operation of the tubes at frequencies higher than 120 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 3 or 4 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-39 or RK-41 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 600 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

When the RK-39 or RK-41 is used as a crystal controlled oscillator, a 10000 ohm grid leak and a 400 ohm cathode resistor are recommended. At the lower frequencies, it may be necessary to increase the grid to plate capacitance in order to start the oscillator. An additional capacitance of 2 μμf. should be sufficient. Larger values will cause excessive feedback and may damage the crystal.

PLATE TEMPERATURE

The plate of the RK-39 or RK-41 will not show color when operated at the maximum rated plate dissipation. Dissipations above the rated value should be avoided.