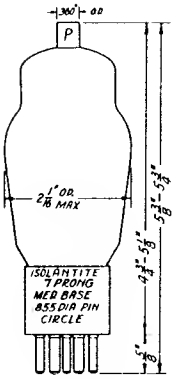
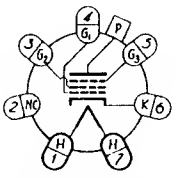
RK-45
PENTODE POWER AMPLIFIER OSCILLATOR



The RK-45 is a heater type pentode power amplifier tube having an isolantite base. It is designed for use as a power amplifier, oscillator or frequency multiplier. The RK-45 may also be used in circuits employing suppressor or control grid modulation.



BOTTOM VIEW OF SOCKET

HEATER RATING

Heater Voltage	12.6	volts
Heater Current	0.45	amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.02	μμf
Input	10	μμf
Output	10	μμf

R-F POWER AMPLIFIER OR OSCILLATOR—CLASS C

MAXIMUM RATINGS

D-C Plate Voltage—Telegraphy	500	volts
D-C Plate Voltage—Telephony With Control or Sup. Grid Modulation	500	volts
With Plate & Screen Mod.	400	volts
D-C Screen Voltage	250	volts
D-C Plate Current	60	ma
D-C Control Grid Current	10	ma
Plate Dissipation	10	watts
Screen Dissipation	8	watts

TYPICAL OPERATION

	Telephony Control Grid Modulation		Telephony Suppressor Grid Modulation	Telephony Plate & Screen Modulation	Telegraphy		
D-C Plate Voltage	500	500	500	400	500	500	volts
D-C Screen Voltage	200	200	200	150	200	200	volts
D-C Sup. Grid Voltage	0	+45	−45	0	0	+45	volts
D-C Con. Grid Volt.	−125	−125	−90	−90	−90	−90	volts
D-C Plate Current	32	34	31	43	50	55	ma
D-C Screen Current	20	20	39	30	40	38	ma
D-C Con. Grid Current	1.5	1.5	4	6	4	4	ma
Screen Resistor	—	—	—	8300‡	—	—	ohms
Peak R-F Input Volt.	150	150	135	145	135	135	volts
R-F Driving Power	1.2*	1.3 *	0.5	0.8	0.5	0.5	watts
Carrier Power Output	5.5	6.5	6	13.5	18	22	watts
Peak A-F Volt.—Plate	—	—	—	400 *	—	—	volts
Peak A-F Volt.—Grid	45 *	45 *	75 *	150 *	—	—	volts
A-F Modulating Power	0.5*	0.55*	0.3*	14.5	—	—	watts
Peak Power Output	22 *	26 *	24 *	54 *	—	—	watts

R-F POWER AMPLIFIER—CLASS B—TELEPHONY

MAXIMUM RATINGS

D-C Plate Voltage	500	volts
D-C Screen Voltage	250	volts
D-C Plate Current (Carrier)	35	ma
Plate Dissipation (Carrier)	10	watts
Screen Dissipation (Carrier)	8	watts

TYPICAL OPERATION

D-C Plate Voltage	500	volts
D-C Screen Voltage	200	volts
D-C Suppressor Grid Voltage	0	volts
D-C Control Grid Voltage	−38	volts
D-C Plate Current	30	ma
D-C Screen Current	12	ma
Peak R-F Input Voltage	80 *	volts
R-F Driving Power	0.24*	watts
Carrier Power Output	5	watts
Peak Power Output	20 *	watts

*At the peak of the a-f cycle with 100% modulation.
‡Connected to plate end of modulation trans. and by-passed for r.f. only.

OPERATING NOTES

CHARACTERISTIC CURVES
For average characteristic curves refer to the type RK-25. The characteristics of the RK-45 and RK-25 are the same except for the heater rating.

FREQUENCY RANGE
The RK-45 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 prevent the plate dissipation from exceeding the maximum rated value.

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 4 or 5 ma. of grid current with very little gained beyond 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-45 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 500 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.

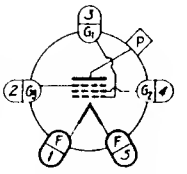
CRYSTAL OSCILLATOR
Using crystal control, 20 watts of r-f power output may be obtained without overheating the crystal.

PLATE TEMPERATURE
The plate of the RK-45 will not show color when operated at the rated plate dissipation. Dissipations above the rated value should be avoided.

RK-46
PENTODE POWER AMPLIFIER OSCILLATOR



The RK-46 is a pentode type power amplifier tube having a thoriated tungsten filament, a molybdenum plate, a hard glass bulb and an isolantite base. It is designed for use as a power amplifier, oscillator or frequency multiplier. The RK-46 may also be used in circuits employing suppressor or control grid modulation.



BOTTOM VIEW OF SOCKET

FILAMENT RATING

Filament Volt.	12.6	volts
Filament Cur.	2.5	amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.1	μμf
Input	14	μμf
Output	12	μμf

R-F POWER AMPLIFIER OR OSCILLATOR—CLASS C

MAXIMUM RATINGS

D-C Plate Voltage—Telegraphy	1250	volts
D-C Plate Voltage—Telephony With Control or Sup. Grid Modulation	1250	volts
With Plate & Screen Mod.	1000	volts
D-C Screen Voltage	300	volts
D-C Plate Current	92	ma
D-C Control Grid Current	15	ma
R-F Control Grid Current	5	amp
Plate Dissipation	40	watts
Screen Dissipation	15	watts

TYPICAL OPERATION

	Telephony Control Grid Modulation		Telephony Suppressor Grid Modulation	Telephony Plate & Screen Modulation	Telegraphy		
D-C Plate Voltage	1250	1250	1250	1000	1250	1250	volts
D-C Screen Voltage	300	300	300	300	300	300	volts
D-C Sup. Grid Volt.	0	+45	−45	0	0	+45	volts
D-C Con. Grid Volt.	−142	−142	−100	−100	−100	−100	volts
D-C Plate Current	40	40	48	75	80	92	ma
D-C Screen Current	7	7	44	30	43	36	ma
D-C Con. Grid Current	1.8	1.8	11.5	10	11.5	11.6	ma
Screen Resistor	—	—	—	23000‡	—	—	ohms
Peak R-F Input Volt.	160	160	140	145	155	155	volts
R-F Driving Power	1.5*	1.5*	1.5	1.3	1.6	1.6	watts
Carrier Power Output	17	20	21	52	64	84	watts
Peak A-F Volt.—Plate	—	—	—	1000*	—	—	volts
Peak A-F Volt.—Grid	30 *	30 *	75 *	300 *	—	—	volts
A-F Modulating Power	0.3*	0.3*	0.36*	52	—	—	watts
Peak Power Output	68 *	80 *	84 *	208 *	—	—	watts

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)	70	ma
Plate Dissipation (Carrier)	40	watts
Screen Dissipation (Carrier)	15	watts

TYPICAL OPERATION

D-C Plate Voltage	1250	volts
D-C Screen Voltage	300	volts
D-C Suppressor Grid Voltage	0	volts
D-C Grid Voltage	−30	volts
D-C Plate Current	43	ma
D-C Screen Current	15	ma
Peak R-F Input Voltage	70 *	volts
R-F Driving Power	0.5*	watts
Carrier Power Output	16	watts
Peak Power Output	64 *	watts

*At the peak of the a-f cycle with 100% modulation.
‡Connected to plate end of modulation trans. and by-passed for r.f. only.

OPERATING NOTES

CHARACTERISTIC CURVES
For average characteristic curves refer to the type RK-20A. The characteristics of the RK-46 and RK-20A are the same except for the filament rating.

FREQUENCY RANGE
The RK-46 may be operated at the maximum ratings at frequencies up to 30 megacycles. At frequencies between 30 megacycles and 60 megacycles the maximum d-c plate voltage should not exceed 900 volts. 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 control grid current in milliamperes. The power output flattens off around 11 or 12 ma. of grid current with very little gained beyond 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-46 it should enclose the base and extend to the lower internal shield and should clear the glass bulb by at least 1/16".

BIAS
Battery bias, or at least partial battery bias on the control grid is recommended. Additional bias may be obtained by placing a resistor in series with the battery.

CRYSTAL OSCILLATOR
Using crystal control, 50 watts of r-f power output may be obtained without overheating the crystal.

PLATE TEMPERATURE
The plate of the RK-46 will not show color when operated at the rated plate dissipation. Dissipations above the rated value should be avoided.