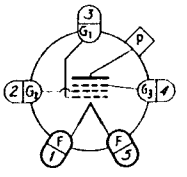


PENTODE POWER AMPLIFIER OSCILLATOR

The RK-20A 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-20A may also be used in circuits employing suppressor or control grid modulation.



BOTTOM VIEW OF SOCKET

FILAMENT RATING

Filament Voltage	7.5	volts
Filament Current	3.25	amp

DIRECT INTERELECTRODE CAPACITANCES

Grid to Plate	0.01	μμf
Input	14	μμf
Output	12	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 or Sup. Grid Modulation	1250	volts
With Plate & Screen Modulation	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	11.5	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

*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.

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*	volts
Carrier Power Output	16	watts
Peak Power Output	64 *	watts

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

OPERATING NOTES

FREQUENCY RANGE
The RK-20A 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.

SCREEN VOLTAGE
The screen voltage may be obtained either from a separate source or through a dropping resistor from the plate supply. The screen should always be by-passed to the filament midpoint for r.f.

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-20A 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-20A will not show color when operated at its rated plate dissipation. Dissipations above the rated value should be avoided.

