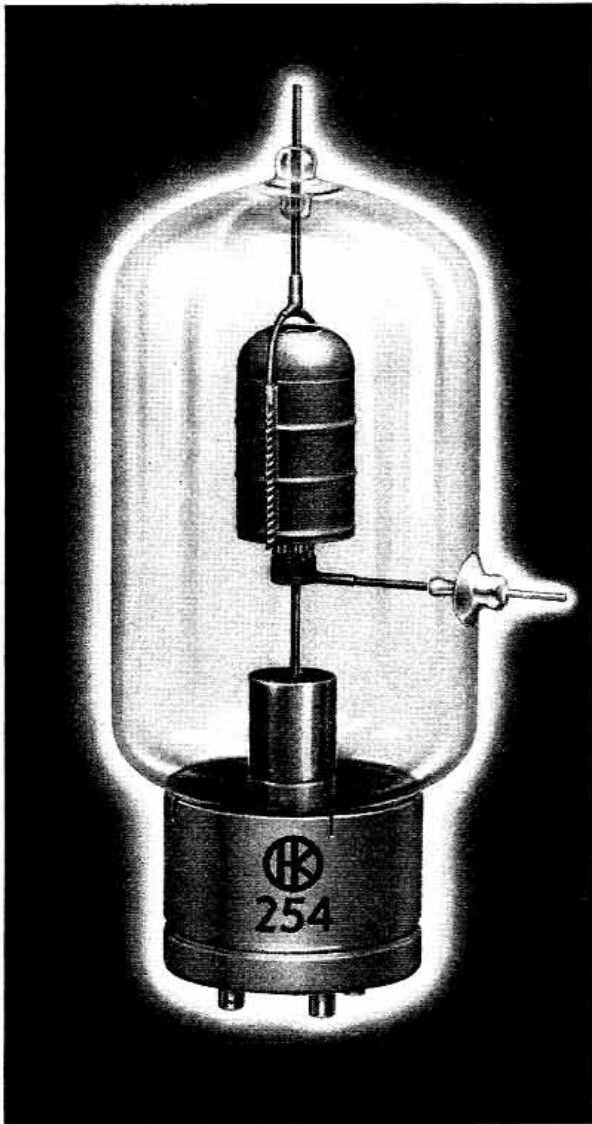


# GAMMATRON TYPE 254



## GENERAL PURPOSE TRIODE

Medium mu universal triode, 100 watt radiation cooled tantalum plate. Special design permits high voltage operation and unusual VHF efficiency.

### PHYSICAL DATA

Plate . . . . .	Cylindrical Tantalum
Grid . . . . .	Braced Vertical Bar Tantalum
Filament . . . . .	Thoriated Tungsten
Net Weight . . . . .	5 Ounces
Net Weight . . . . .	6½ Ounces
Shipping Weight . . . . .	1½ Pounds
Maximum Height . . . . .	7¼ Inches
Maximum Diameter . . . . .	2¼ Inches

### ELECTRICAL DATA

Filament Voltage . . . . .	5.0 Volts
Filament Current . . . . .	7.5 Amps
Normal Plate Dissipation . . . . .	100 Watts
Maximum Average Plate Current . . . . .	225 MA.
Maximum Average Grid Current . . . . .	60 MA.
Maximum Plate Voltage . . . . .	4000 Volts
Average Amplification Constant . . . . .	25

### INTERELECTRODE CAPACITANCES

Grid-Plate . . . . .	2.7 Mmfd.
Grid-Filament . . . . .	2.5 Mmfd.
Plate-Filament . . . . .	0.4 Mmfd.

The Type 254 GAMMATRON is capable of high voltage operation, long life, unusual VHF efficiency and has the ability to stand heavy over-loads. These results are achieved by the use of a tantalum grid and plate in combination with unique Heintz and Kaufman engineering developments.

The plate and grid are mounted on short, sturdy, low resistance leads. Internal insulators are not required while perfect alignment is maintained, thus the interelectrode capacity is low and the insulation high. A plate dome confines the electron stream within the plate, eliminating destructive bombardment of the envelope and plate seal and also improving the plate efficiency. These features combine to give exceptional VHF performance.

The grid seal is protected from failure at very severe VHF loads by means of a silver film. This patented device prevents electrolytic currents from decomposing the glass at the tungsten seal, and thus grid cracks sometimes experienced in ordinary tubes are eliminated.

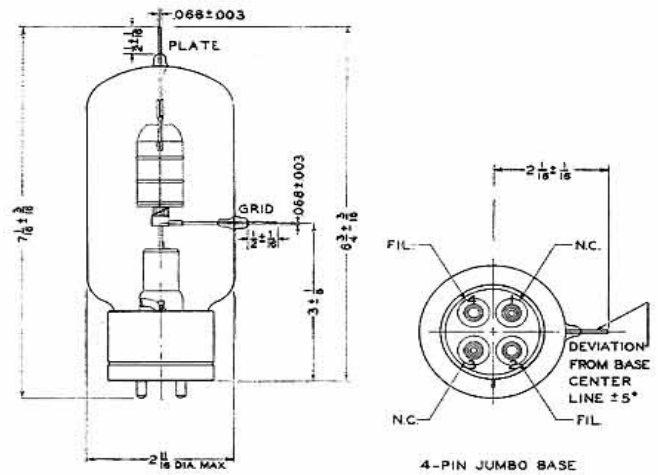
The use of tantalum and the elimination of unnecessary internal structures makes it possible to exhaust GAMMATRON tubes at very high temperatures. This technique completely eliminates all of the internal gas, the usual "getter" is not necessary, and the tube cannot become soft even due to heavy overloads. The ability of tantalum to reabsorb gas even though operating at high temperatures insures an excellent vacuum permanently, and long filament life.

## HEINTZ AND KAUFMAN LTD.

SOUTH SAN FRANCISCO, CALIFORNIA, U · S · A

## TYPE HK 254

The information on this and the following page does not represent exact conditions of operation to be imposed for any particular situation. Because tubes are used under many widely different conditions Heintz and Kaufman will gladly furnish information for applications which differ appreciably from the illustrative examples given.



### RADIO FREQUENCY POWER AMPLIFIER CLASS C UNMODULATED\*

	Maximum Rating Per Tube		Typical Operation, 1 Tube		
Power Output.....		400	400	330	125 Watts
Driving Power.....		12	18	25	25 Watts
DC Plate Voltage.....	4000	4000	3000	2000	1000 Volts
DC Plate Current.....	225	125	165	215	225 ma
DC Grid Current.....	60	30	40	55	60 ma
DC Grid Voltage.....	-1000	-260	-245	-230	-195 Volts
Peak RF Grid Voltage.....		450	480	500	480 Volts
Plate Dissipation.....	100	100	100	100	80 Watts
Plate Input.....	500	500	500	430	225 Watts

\*Carrier conditions for telegraphy.

### RADIO FREQUENCY POWER AMPLIFIER CLASS C PLATE MODULATED\*

	Maximum Rating Per Tube		Typical Operation, 1 Tube		
Power Output.....		335	335	275	115 Watts
Driving Power.....		19	23	25	23 Watts
DC Plate Voltage.....	3000	3000	2500	2000	1000 Volts
DC Plate Current.....	180	140	168	180	180 ma
DC Grid Current.....	60	35	40	45	45 ma
DC Grid Voltage.....	-800	-355	-360	-355	-315 Volts
Peak RF Grid Voltage.....		580	610	620	580 Volts
Plate Dissipation.....	85	85	85	85	65 Watts
Plate Input.....	420	420	420	360	180 Watts

\*Carrier conditions for 100% modulation and 60% average value.

### AUDIO FREQUENCY POWER AMPLIFIER CLASS B\*

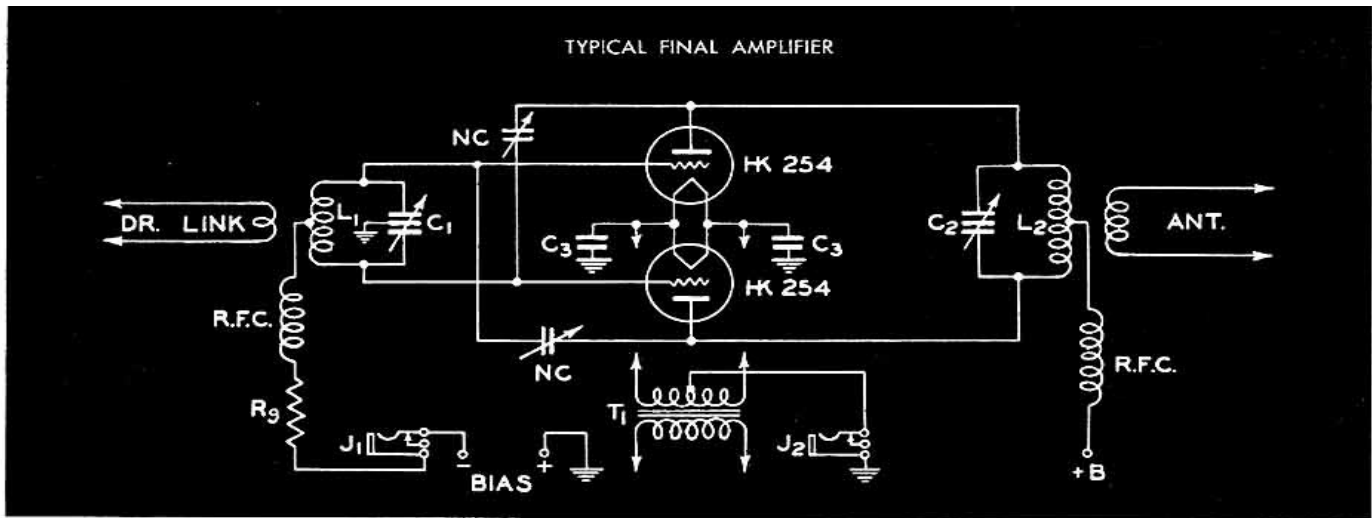
	Maximum Ratings Two Tubes		Typical Operation, 2 Tubes		
Power Output.....		430	420	400	280 Watts
Driving Power**.....		20	25	47	60 Watts
DC Plate Voltage.....	3000	3000	2500	2000	1000 Volts
DC Plate Current, Zero Signal.....		30	40	45	70 ma
DC Plate Current, Max. Signal.....	500	200	240	280	480 ma
DC Grid Voltage.....		-110	-80	-60	-15 Volts
Peak AF Grid to Grid Voltage.....		470	460	520	530 Volts
Plate Dissipation.....	200	170	180	160	200 Watts
Plate Input, Max. Signal.....	600	600	600	560	480 Watts
Load Resistance, Plate to Plate.....		36,400	25,200	16,400	4,000 Ohms

\*All data for two tubes.

\*\*Instantaneous power at crest of cycle: effective power is 1/2 of this value.

# Gammatron Tubes

TYPICAL FINAL AMPLIFIER



This typical final push-pull amplifier is capable of a maximum unmodulated output of 750 watts and requires a driving power of less than 50 watts. The driver stage may consist of an HK 24 or a pair of 807 tubes which may be link coupled with the grid inductance,  $L_1$ . It is advisable to supply enough fixed bias to prevent plate current flow under static conditions (see plate curve), and the remaining bias is then developed by the grid current flow through  $R_g$ . Thus: DC grid voltage = Fixed Bias + ( $R_g \times$  DC grid current).

COIL DATA

Band	$L_1$	$L_2$
160 Meters	85 turns # 24 DCC Close Wound Diameter $1\frac{3}{4}$ Inches	30 Turns # 12 Length $4\frac{1}{2}$ Inches Diameter 5 Inches
80 Meters	52 Turns # 18 Enamel Close Wound Diameter $1\frac{3}{4}$ Inches	22 Turns # 12 Length 3 Inches Diameter 5 Inches
40 Meters	30 Turns # 14 Enamel Close Wound Diameter $1\frac{3}{4}$ Inches	22 Turns # 12 Length $3\frac{5}{8}$ Inches Diameter $2\frac{1}{2}$ Inches
20 Meters	12 Turns # 14 Enamel Length $1\frac{3}{8}$ Inches Diameter $1\frac{3}{4}$ Inches	8 Turns # 12 Length $1\frac{1}{8}$ Inches Diameter $2\frac{1}{2}$ Inches
10 Meters	6 Turns # 14 Enamel Length $1\frac{3}{8}$ Inches Diameter $1\frac{3}{4}$ Inches	6 Turns $\frac{1}{4}$ -Inch Copper Tubing Length 4 Inches Diameter $2\frac{1}{2}$ Inches

COMPONENTS

- $C_1$  — Split-stator transmitting condenser, 100 mmfd. per section 0.07 inch air gap.
- $C_2$  — Split-stator transmitting condenser, 75 mmfd. per section 0.20 inch air gap.
- $C_3$  — .01 mfd. paper condenser.
- N.C. — Neutralizing condensers 0.5 to 10 mmfd.
- $J_1$  and  $J_2$  — Jacks to measure grid and cathode current.
- $R_g$  — As required by operating conditions (see data).
- $T_1$  — 5.0 volt, 15 ampere filament transformer.

VERY HIGH FREQUENCY PERFORMANCE

FREQUENCY	30	60	120	200 mc
<b>Class C Unmodulated</b>				
Max. Input .....	500	430	360	280 Watts
Max. Plate Volts.....	4000	3200	2700	2300 Volts
Typical Plate Efficiency.....	80	77	72	64 Percent
<b>Class C Plate Modulated</b>				
Max. Input .....	420	360	300	230 Watts
Max. Plate Volts.....	3000	2600	2200	1900 Volts

RADIO FREQUENCY DOUBLER AMPLIFIER  
(Feedback neutralized by conventional methods)

	Maximum Rating Per Tube		Typical Operation, 1 Tube		
Power Output.....			150	125	80 Watts
Driving Power.....			10	12	12 Watts
DC Plate Voltage.....	4000		2500	2000	1500 Volts
DC Plate Current.....	225		100	112	120 ma
DC Grid Current.....	60		10	12	12 ma
DC Grid Voltage.....	-1000		-850	-920	-900 Volts
Peak RF Grid Voltage.....			1050	1150	1125 Volts
Plate Dissipation.....	100		100	100	100 Watts
Plate Input .....	250		250	225	180 Watts

*Gammatron Tubes*

TYPE 254 GAMMATRON  
AVERAGE STATIC  
CHARACTERISTICS

