RADIO MANUFACTURERS ASSOCIATION
ENGINEERING DEPARTMENT

sponsor:
General Electric Co.

Registration No. 351
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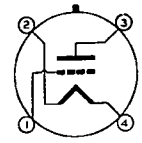
RMA TYPE 4C21

GENERAL PURPOSE TRIODE

4AZ



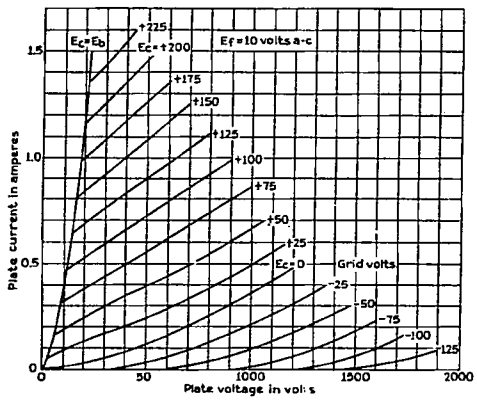
Salient Characteristics

ELECTRICAL

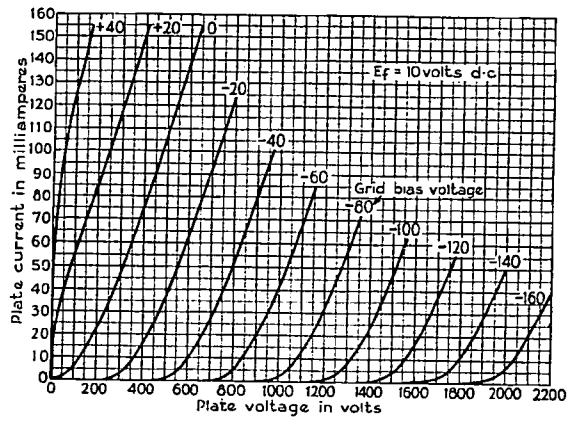
Filament Voltage	10 volts
Filament Current	3.25 amperes
Amplification Factor	12
Grid-plate Transconductance, I_b=60 ma	3600 micromhos
Grid Current; E_f=9 volts dc; E_b=250 volts dc; E_c=+100 volts dc	15 to 30 ma
Direct Interelectrode Capacitances	
Grid-plate	14.5 uuf
Input	6 uuf
Output	5.5 uuf
DC Plate Voltage	1250 volts (max)
Plate Dissipation	100 watts (max)

MECHANICAL

Bulb	T-18
Overall Height	7-7/8 inches (max)
Base	Jumbo 4 large pin
Basing	4AZ
Tube Mounting Position	Vertical; Base Down



Average Plate Characteristic



Average Plate Characteristic

Maximum Ratings and Typical Operating Conditions

CLASS A A-F AMPLIFIER AND MODULATOR

Filament Voltage			10			volts
DC Plate Voltage	750	1000	1250	1250	max	volts
Plate Dissipation				75	max	watts
DC Grid Voltage	-46	-61	-80			volts
Peak Grid Swing approx	41	56	75			volts
DC Plate Current	34	53	60			milliamperes
Plate Resistance	4400	3800	3600			ohms
Load Resistance	8800	7600	9200			ohms
Plate Power Output, 5% second harmonic	5.6	12	19.7			watts

CLASS B A-F POWER AMPLIFIER (TWO TUBES)

Filament Voltage		10			volts
DC Plate Voltage	1000	1250	1250	max	volts
Max Signal Plate Current, per tube*			0.175	max	amperes
DC Max Signal Plate Input, per tube*			220	max	watts
Plate Dissipation, per tube*			100	max	watts
DC Grid Voltage	-72	-95			volts
Peak AF Grid Input Voltage	380	410			volts
Zero Signal Plate Current	20	20			milliamperes
Max Signal Plate Current	320	320			milliamperes
Max Signal Driving Power, approx	7.5	8			watts
Effective Load, plate-to-plate	6900	9000			ohms
Max Signal Plate Power Output	200	260			watts

CLASS B R-F POWER AMPLIFIER

Carrier conditions per tube for use with a maximum modulation factor of 1.0

Filament Voltage		10			volts
DC Plate Voltage	1000	1250	1250	max	volts
DC Grid Voltage	-72	-95			volts
DC Plate Current	0.130	0.106	0.150	max	amperes
Plate Input			150	max	watts
Plate Dissipation			100	max	watts
Peak RF Grid Input Voltage	125	125			volts
DC Grid Current, approx	5	1			milliamperes
Driving Power** approx	10	7.5			watts
Plate Power Output	40	42.5			watts

CLASS C R-F POWER AMPLIFIER AND OSCILLATOR, PLATE MODULATED

Carrier conditions per tube for use with a maximum modulation factor of 1.0

Filament Voltage	10				volts
DC Plate Voltage	750	1000	1000	max	volts
DC Grid Voltage	-200	-260	-400	max	volts
DC Plate Current	0.150	0.150	0.175	max	ampere
DC Grid Current, approx	0.035	0.035	0.050	max	ampere
Plate Input			175	max	watts
Plate Dissipation			67	max	watts
Peak RF Grid Input Voltage, approx	350	410			volts
Driving Power, approx	12	14			watts
Plate Power Output	65	100			watts

CLASS C R-F POWER AMPLIFIER AND OSCILLATOR

Key down conditions per tube without modulation ***

Filament Voltage	10					volts
DC Plate Voltage	750	1000	1250	1250	max	volts
DC Grid Voltage	-135	-175	-225	-400	max	volts
DC Plate Current	0.150	0.150	0.150	0.175	max	ampere
DC Grid Current, approx	0.018	0.018	0.018	0.050	max	ampere
Plate Input				220	max	watts
Plate Dissipation				100	max	watts
Peak RF Grid Input Voltage, approx	275	315	375			volts
Driving Power, approx	5	6	7			watts
Plate Power Output	65	100	130			watts

* Averaged over any audio frequency cycle.
** At crest of audio-frequency cycle.
***Modulation, essentially negative, may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

The normal value of grid leak, when the tube is used as an oscillator or r-f power amplifier (Class C), is in the neighborhood of 5000 ohms, although this may be replaced by a suitable fixed bias. If self-bias is used the cathode resistor should be approximately 1000 ohms.

The 4C21 can be operated at frequencies as high as 15 megacycles. It may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced as the frequency is raised (other maximum ratings are the same as shown above).

The tabulation below shows the highest percentage of maximum plate voltage and power input that should be used up to 80 megacycles for the various classes of service.

Special attention should be given to adequate ventilation of the bulb at these frequencies.

FREQUENCY	15	30	80	megacycles

PERCENTAGE OF MAXIMUM RATED PLATE VOLTAGE AND PLATE INPUT

Class B	100	88	70	per cent
Class C	100	80	50	per cent

The resonant frequency of the grid-plate circuit is approximately 100 megacycles.