AMPEREX TUBE TYPE 6156

The 6156/4-250-A is a four-electrode tube designed for use as a radio-frequency power amplifier and modulator. The anode is capable of dissipating 250 watts. Maximum ratings apply up to 75 megacycles. At reduced ratings it may be operated up to 120 megacycles.

GENERAL CHARACTERISTICS

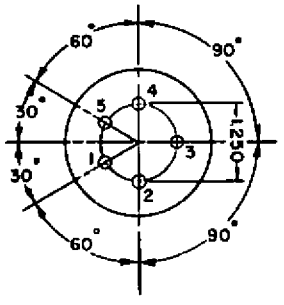
Electrical Data	Min.	Bogey	Max.	
Filament Voltage	4.75	5.0	5.25	volts
Filament Current at Bogey Voltage	13.5	14.1	14.7	amperes
Amplification Factor				
G_1 -G_2 Mu at Eb = 3000 volts				
Ec_2 = 500 volts, Ib = 100 ma	4.5	5.1	6.0	
Peak Cathode Current[1]	--	--	2600	ma
Direct Interelectrode Capacitances				
Grid-Plate	--	--	0.14	uuf
Input	10.7	12.7	14.5	uuf
Output	3.7	4.5	5.1	uuf

Mechanical Data	
Mounting Position - vertical, base up or down	
Maximum Plate Temperature	850° C.
Required Air Flow to Base	5 cfm
Required Air Flow to Envelope[2]	5 cfm
Maximum Glass Temperature[3]	
at bottom seals	180° C.
at plate seal	220° C.
Net Weight, approximate	6.4 ounces

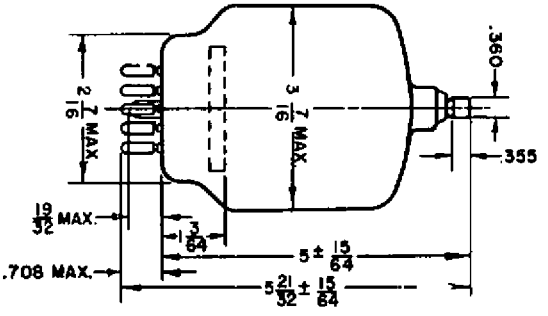
1 Represents maximum usable cathode current (plate current plus current to each grid) for any condition of operation.

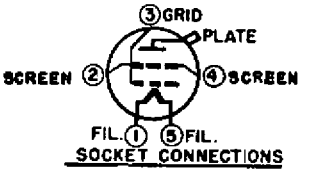
2 Maximum ratings, frequency above 30 megacycles.

3 In cases where the maximum permissible temperatures are likely to be exceeded, as would normally be the the case at frequencies above 30 Mc/s with full ratings, a low velocity air flow should be directed on the anode seal and the bottom of the envelope.

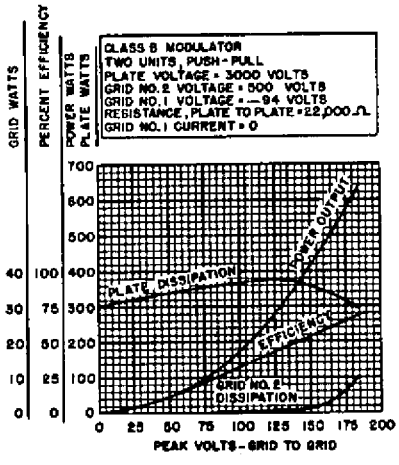


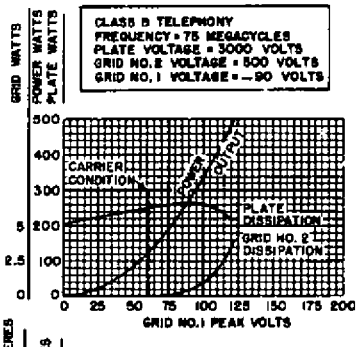
GIANT 5 PIN BASE
PINS-.187 DIA.

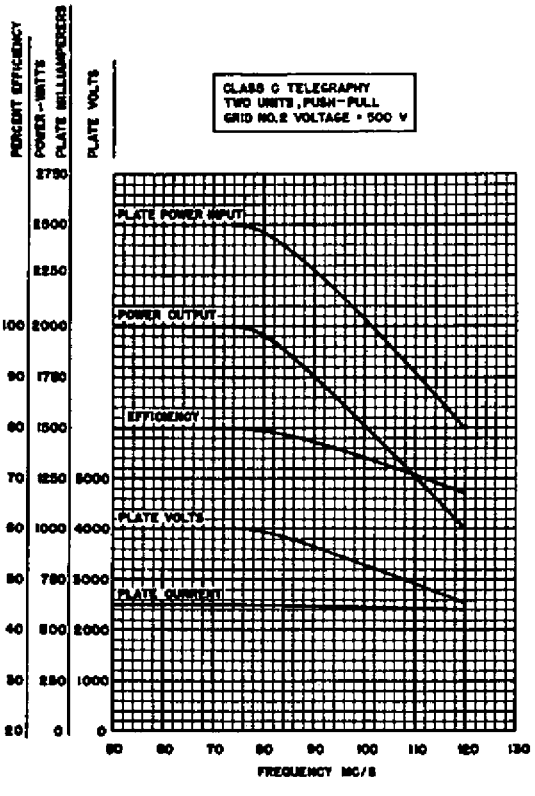


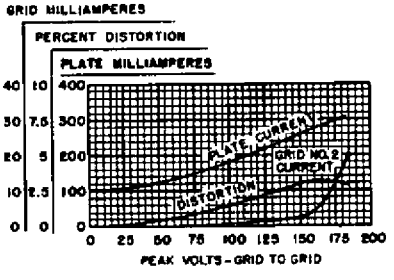


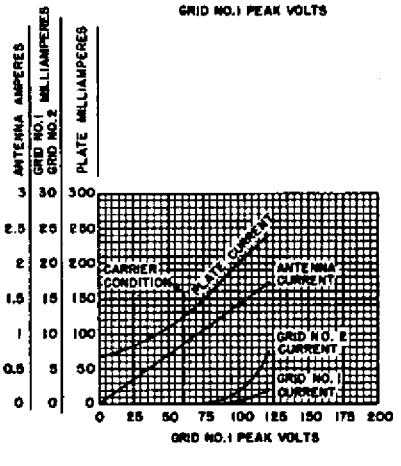
SOCKET CONNECTIONS











MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

A.F. Power Amplifier and Modulator Class AB1

Maximum Ratings, Absolute Values

	CCS	
D.C. Plate Voltage	4000	volts max.
D.C. Grid No. 2 Voltage	600	volts max.
D.C. Grid No. 1 Voltage	—500	volts max.
Maximum Signal D.C. Plate Current[4]	350	ma max.
Maximum Signal Plate Input[4]	750	watts max.
Maximum Signal Grid No. 2 Input[4]	35	watts max.
Plate Dissipation[4]	250	watts max.

Typical Operation

Unless otherwise specified, values are for two tubes.

	CCS	CCS	CCS	CCS	
D.C. Plate Voltage	1500	2000	2500	3000	volts
D.C. Grid No. 2 Voltage	500	500	500	500	volts
D.C. Grid No. 1 Voltage	—85	—88	—91	—94	volts
Peak A.F. Grid No. 1 to Grid No. 1 Voltage	167	173	178	184	volts
Zero Signal D.C. Plate Current	100	100	100	100	ma
Maximum Signal D.C. Plate Current	300	300	310	310	ma
Effective Load Resistance, Plate to Plate	10000	14500	18000	22000	ohms
Maximum Signal Driving Power[5]	0	0	0	0	watts
Maximum Signal Power Output	268	390	510	635	watts

A.F. Power Amplifier and Modulator Class AB2

Maximum Ratings, Absolute Values

	CCS	
D.C. Plate Voltage	4000	volts max.
D.C. Grid No. 2 Voltage	600	volts max.
D.C. Grid No. 1 Voltage	—500	volts max.
Maximum Signal D.C. Plate Current[4]	350	ma max.
Maximum Signal Plate Input[4]	1000	watts max.
Maximum Signal Grid No. 2 Input[4]	35	watts max.
Plate Dissipation[4]	250	watts max.

Typical Operation

Unless otherwise specified, values are for two tubes.

	CCS	CCS	CCS	CCS	
D.C. Plate Voltage	1500	2000	2500	3000	volts
D.C. Grid No. 2 Voltage	300	300	300	300	volts
D.C. Grid No. 1 Voltage	—45	—49	—51	—55	volts
Peak A.F. Grid No. 1 to Grid No. 1 Voltage	323	328	306	280	volts
Zero Signal D.C. Plate Current	100	100	100	100	ma
Maximum Signal D.C. Plate Current	694	694	624	550	ma
Zero Signal D.C. Grid No. 2 Current	0	0	0	0	ma
Maximum Signal D.C. Grid No. 2 Current	116	110	88	69	ma
Effective Load Resistance, Plate to Plate	4550	6600	9200	14000	ohms
Maximum Signal Driving Power[6]	8.0	8.0	5.8	3.8	watts
Maximum Signal Power Output	660	974	1140	1240	watts

R.F. Power Amplifier—Class B

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

Maximum Ratings, Absolute Values

	CCS	
D.C. Plate Voltage	4000	volts max.
D.C. Grid No. 2 Voltage	600	volts max.
D.C. Plate Current	210	ma max.
Plate Input	400	watts max.
Grid No. 2 Input	23	watts max.
Plate Dissipation	250	watts max.

Typical Operation

	CCS	CCS	CCS	
D.C. Plate Voltage	2500	3500	4000	volts
D.C. Grid No. 2 Voltage	500	500	500	volts
D.C. Grid No. 1 Voltage	—84	—80	—100	volts
Peak R.F. Grid No. 1 Voltage	66	61	55.5	volts
D.C. Plate Current	150	125	94	ma
D.C. Grid No. 2 Current	0	0	0	ma
D.C. Grid No. 1 Current, approximate	0	0	0	ma
Driving Power, approximate[7]	0.75	0.25	0.06	watts
Power Output, approximate	125	125	126	watts

Plate and Screen Grid Modulated R.F. Power Amplifier—Class C Telephony

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

Maximum Ratings, Absolute Values

	CCS	
D.C. Plate Voltage	3200	volts max.
D.C. Grid No. 2 Voltage	600	volts max.
D.C. Grid No. 1 Voltage	—500	volts max.
D.C. Plate Current	275	ma max.
D.C. Grid No. 1 Current	20	ma max.
Plate Input	825	watts max.
Grid No. 2 Input	35	watts max.
Plate Dissipation	165	watts max.

Typical Operation

	CCS	CCS	
D.C. Plate Voltage	2500	3000	volts
D.C. Grid No. 2 Voltage	400	400	volts
D.C. Grid No. 1 Voltage	—200	—310	volts
Peak A.F. Grid No. 2 Voltage	350	350	volts
Peak R.F. Grid No. 1 Voltage	326	484	volts
D.C. Plate Current	200	225	ma
D.C. Grid No. 2 Current	30	30	ma
D.C. Grid No. 1 Current, approximate	9	9	ma
Driving Power, approximate	3.0	4.4	watts
Power Output, approximate	375	510	watts

R.F. Power Amplifier and Oscillator Class C Telegraphy

Key-down conditions per tube without amplitude modulation[8]

Maximum Ratings, Absolute Values

	CCS	
D.C. Plate Voltage	4000	volts max.
D.C. Grid No. 2 Voltage	600	volts max.
D.C. Grid No. 1 Voltage	—500	volts max.
D.C. Plate Current	350	ma max.
D.C. Grid No. 1 Current	20	ma max.
Plate Input	1250	watts max.
Grid No. 2 Input	35	watts max.
Plate Dissipation	250	watts max.

Typical Operation

	CCS	CCS	CCS	
D.C. Plate Voltage	2500	3000	4000	volts
D.C. Grid No. 2 Voltage	500	500	500	volts
D.C. Grid No. 1 Voltage	—150	—180	—225	volts
Peak R.F. Grid No. 1 Voltage	284	327	374	volts
D.C. Plate Current	300	345	312	ma
D.C. Grid No. 2 Current	60	60	45	ma
D.C. Grid No. 1 Current, approximate	9	10	9	ma
Driving Power, approximate	2.4	3.3	3.4	watts
Power Output, approximate	575	800	1000	watts

Maximum ratings apply up to 75 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	75	100	120 megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input			
Class B	100	80	60 per cent
Class C Plate Telephony	100	80	60 per cent
Class C Telegraphy	100	80	60 per cent

Electrical Data and Limits

Characteristic	Conditions		Limits Min.	Limits Bogey	Limits Max.	
Grid Voltage	Eb=600 V, Ec2=500 V, Ib=2000 ma	E_{c_1}:	—	—	150	volts
Grid No. 2 Current	Eb=600 V, Ec2=500 V, Ib=2000 ma	I_{c_2}:	—	—	1100	ma
Grid No. 1 Current	Eb=600 V, Ec2=500 V, Ib=2000 ma	I_{c_1}:	—	—	250	ma
Plate Current	Eb=3000 V, Ec2=500 V, Ec1=—48 V	Ib:	170	280	360	ma
Plate Current	Eb=3000 V, Ec2=500 V, Ec1=—75 V	Ib:	60	110	165	ma
Plate Current	Eb=3000 V, Ec2=500 V, Ec1=—140V	Ib:	—	—	7	ma
Grid No. 2 Current	Eb=3000 V, Ec2=500 V, Ec1=—75 V	I_{c_2}:	—	—	4	ma
Power Output	Eb=4000 V, Ec2=500 V, Ec1=—225V, Ib=250 ma, Ic2=45 ma, Ic1=9 ma, f=60 megacycles	Po:	750	—	—	watts

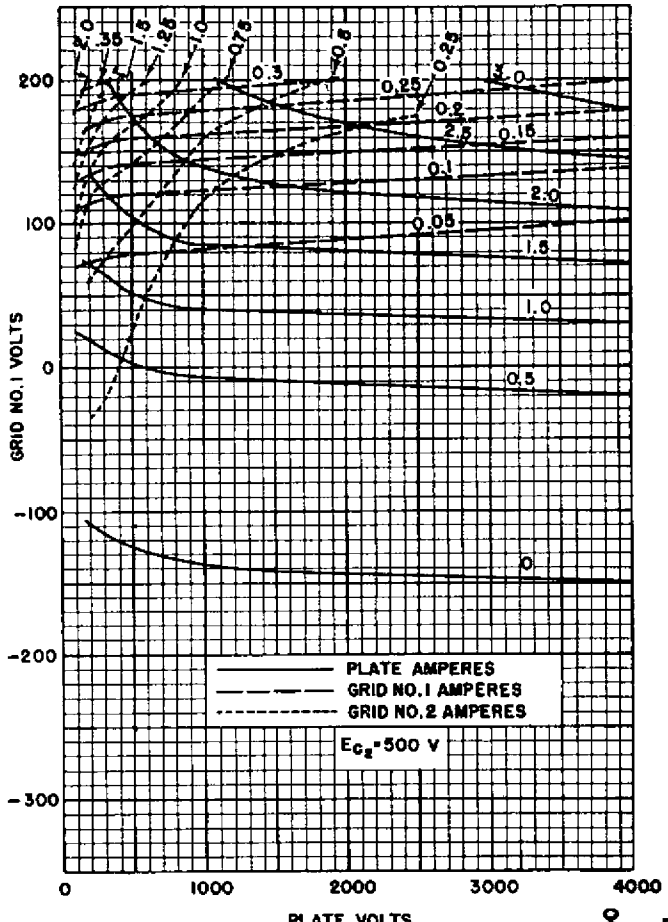
[4]Averaged over any audio-frequency cycle of sine-wave form.

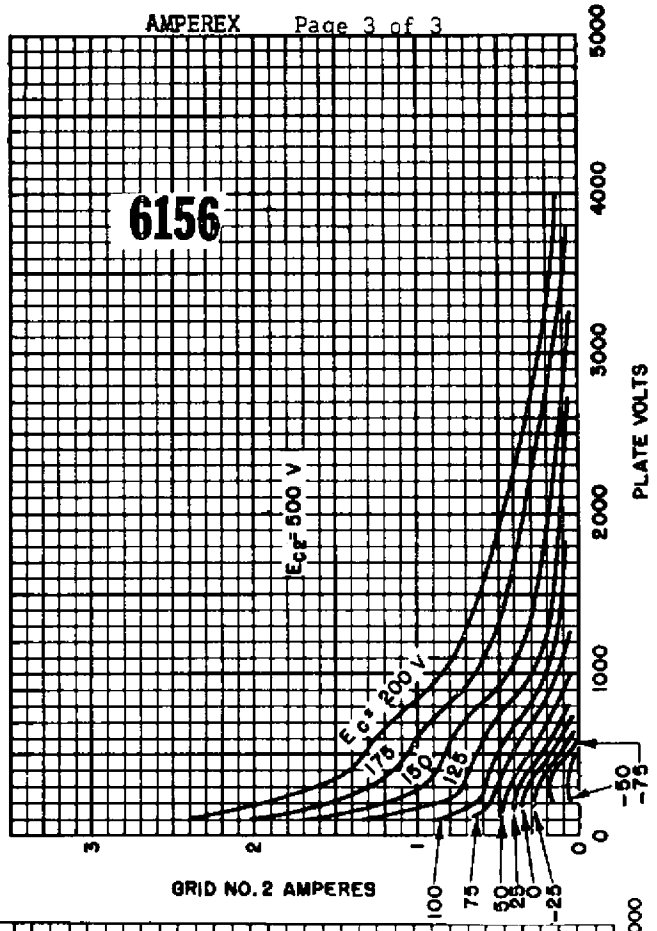
[5]The effective resistance per grid No. 1 circuit of the class AB1 stage should be kept below 0.25 megohms.

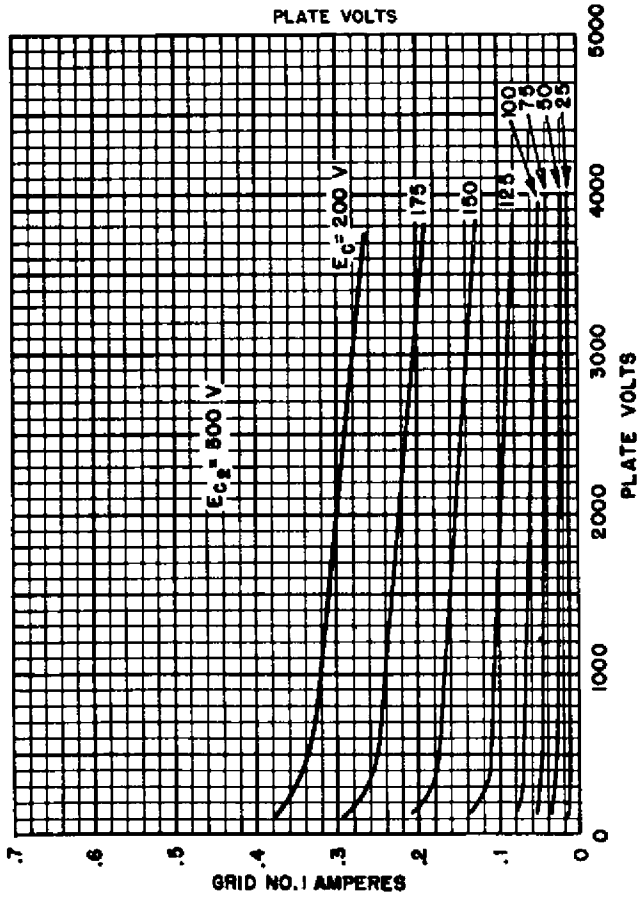
[6]Driver stage should be capable of supplying the No. 1 grids of the class AB2 stage with the specified driving power at low distortion. When a bias supply is used, the DC-resistance of the bias source should not exceed 250 ohms.

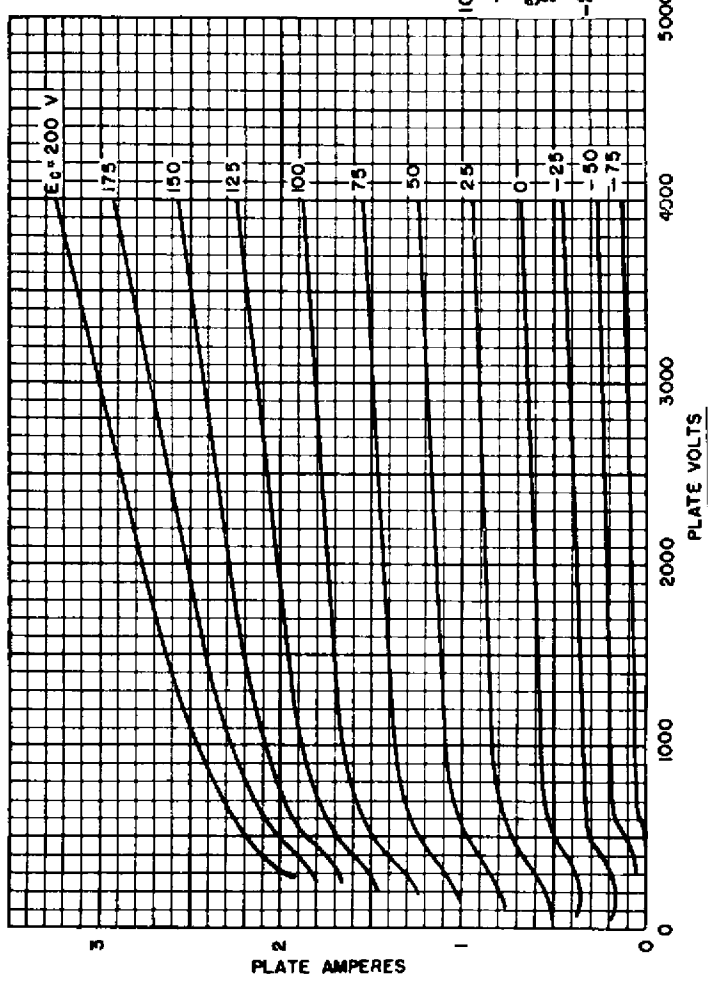
[7]At crest of audio-frequency cycle with modulation factor of 1.0.

[8]Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.


GRID NO.1 VOLTS
PLATE VOLTS
PLATE AMPERES
GRID NO.1 AMPERES
GRID NO.2 AMPERES
E_{c_2}=500 V


6156
E_{c_2}=500 V
E_c=200 V
PLATE VOLTS
GRID NO. 2 AMPERES


E_{c_2}=500 V
E_c=200 V
PLATE VOLTS
GRID NO.1 AMPERES


E_c=200 V
PLATE VOLTS
PLATE AMPERES