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6156/4-250A

BEAM POWER TUBE

FORCED-AIR COOLED

Useful with full input up to 75 Mc
and with reduced input up to 120 Mc

GENERAL DATA

Electrical:

Filament, Thoriated Tungsten:

Voltage 5.0 ac or dc volts
Current at 5.0 volts . . . 14.1 amp

Mu-Factor, Grid No.2 to Grid No.1

for plate volts = 3000, grid-No.2
volts = 500, and plate ma. = 100 5.1

Direct Interelectrode Capacitances:

Grid No.1 to plate 0.14 max. μf
Grid No.1 to filament and grid No.2. 13 μf
Plate to filament and grid No.2. 4.6 μf

Mechanical:

Operating Position Vertical, base down or up

Maximum Overall Length 5-29/32"

Seated Length. 5" $\pm$ 1/4"

Maximum Diameter 3-7/16"

Weight (Approx.) 6 oz

Cap. Small

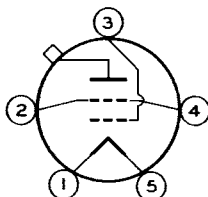
Base Special-Button Giant 5-Pin

Basing Designation for BOTTOM VIEW 5BK

Pin 1-Filament

Pin 2-Grid No.2

Pin 3-Grid No.1



Pin 4-Grid No.2,
Internal
Shield

Pin 5-Filament
Cap-Plate

Forced-Air Cooling 5 cfm

Under any condition of operation, adequate cooling of the bulb must be provided to limit the seal temperatures to their specified maximum values. At frequencies above 30 Mc, special attention should be given to adequate cooling of the bulb and seals. The use of a heat-radiating plate connector is recommended.

Seal Temperature:

Plate. 220 max. $^{\circ}\text{C}$
Grid No.2, grid No.1, and filament 180 max. $^{\circ}\text{C}$

AF POWER AMPLIFIER & MODULATOR — Class AB₁

Maximum CCS[®] Ratings, Absolute Values:

DC PLATE VOLTAGE 4000 max. volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE 600 max. volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE. -500 max. volts

↓, •: See next page.



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MAX.—SIGNAL DC PLATE CURRENT*	350 max.	ma
MAX.—SIGNAL PLATE INPUT*	750 max.	watts
MAX.—SIGNAL GRID-No.2 INPUT*	35 max.	watts
PLATE DISSIPATION*	250 max.	watts

Typical CCS Operation:

Values are for 2 tubes

DC Plate Voltage	1500	2000	2500	3000	volts
DC Grid-No.2 Voltage [□]	500	500	500	500	volts
DC Grid-No.1 Voltage [▲]	-85	-88	-91	-94	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	167	173	178	184	volts
Zero-Signal DC Plate Current	100	100	100	100	ma
Max.—Signal DC Plate Current	300	300	310	310	ma
Effective Load Resistance (Plate to plate)	10000	14500	18000	22000	ohms
Max.—Signal Driving Power	0	0	0	0	watts
Max.—Signal Power Output (Approx.)	265	390	510	635	watts

AF POWER AMPLIFIER & MODULATOR — Class AB₂[‡]

Maximum CCS* Ratings, Absolute Values:

DC PLATE VOLTAGE	4000 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	600 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE	-500 max.	volts
MAX.—SIGNAL DC PLATE CURRENT*	350 max.	ma
MAX.—SIGNAL PLATE INPUT*	1000 max.	watts
MAX.—SIGNAL GRID-No.2 INPUT*	35 max.	watts
PLATE DISSIPATION*	250 max.	watts

Typical CCS Operation:

Values are for 2 tubes

DC Plate Voltage	1500	2000	2500	3000	volts
DC Grid-No.2 Voltage [□]	300	300	300	300	volts
DC Grid-No.1 Voltage ^{**}	-45	-49	-51	-55	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	323	328	306	280	volts
Zero-Signal DC Plate Current	100	100	100	100	ma
Max.—Signal DC Plate Current	694	694	624	550	ma
Zero-Signal DC Grid-No.2 Current	0	0	0	0	ma
Max.—Signal DC Grid-No.2 Current	116	110	88	69	ma
Effective Load Resistance (Plate to plate)	4550	6600	9200	14000	ohms
Max.—Signal Driving Power (Approx.) ^{oo}	8	8	5.8	3.8	watts
Max.—Signal Power Output (Approx.)	660	975	1140	1240	watts

[‡], [•], ^{*}, [□], [▲], [‡], ^{**}, ^{oo}: See next page.



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BEAM POWER TUBE

RF POWER AMPLIFIER — Class B Telephony

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

Maximum CCS* Ratings, Absolute Values:

DC PLATE VOLTAGE	4000 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	600 max.	volts
DC PLATE CURRENT	210 max.	ma
PLATE INPUT.	400 max.	watts
GRID-No.2 INPUT.	23 max.	watts
PLATE DISSIPATION.	250 max.	watts

Typical CCS Operation:

DC Plate Voltage	2500	3500	4000	volts
DC Grid-No.2 Voltage	500	500	500	volts
DC Grid-No.1 (Control-Grid) Voltage.	-84	-90	-100	volts
Peak RF Grid-No.1 Voltage.	66	61	55.5	volts
DC Plate Current	150	125	94	ma
DC Grid-No.2 Current	0	0	0	ma
DC Grid-No.1 Current (Approx.)	0	0	0	ma
Driving Power (Approx.)*	0.75	0.25	0.06	watt
Power Output (Approx.)	125	125	126	watts

PLATE-MODULATED RF POWER AMPLIFIER — Class C Telephony

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

Maximum CCS* Ratings, Absolute Values:

DC PLATE VOLTAGE	3200 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	600 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE.	-500 max.	volts
DC PLATE CURRENT	275 max.	ma
DC GRID-No.1 CURRENT	20 max.	ma
PLATE INPUT.	825 max.	watts
GRID-No.2 INPUT.	35 max.	watts
PLATE DISSIPATION.	165 max.	watts

Typical CCS Operation:

DC Plate Voltage	2500	3000	volts
DC Grid-No.2 Voltage†.	400	400	volts
DC Grid-No.1 Voltage	-200	-310	volts
Peak AF Grid-No.2 Voltage (For 100% modulation).	350	350	volts
Peak RF Grid-No.1 Voltage.	326	484	volts
DC Plate Current	200	225	ma
DC Grid-No.2 Current	30	30	ma
DC Grid-No.1 Current (Approx.)	9	9	ma
Driving Power (Approx.).	3	4.4	watts
Power Output (Approx.)	375	510	watts

●, ●, *, □, ▲, ☼, **, oo, ★, †: See next page.



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BEAM POWER TUBE

RF POWER AMPLIFIER & OSCILLATOR — Class C Telegraphy♦
and

RF POWER AMPLIFIER — Class C FM Telephony

Maximum CCS* Ratings, Absolute Values:

DC PLATE VOLTAGE	4000 max.	volts
DC GRID-No.2 (SCREEN-GRID) VOLTAGE	600 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE.	-500 max.	volts
DC PLATE CURRENT	350 max.	ma
DC GRID-No.1 CURRENT	20 max.	ma
PLATE INPUT.	1250 max.	watts
GRID-No.2 INPUT.	35 max.	watts
PLATE DISSIPATION.	250 max.	watts

Typical CCS Operation:

DC Plate Voltage	2500	3000	4000	volts
DC Grid-No.2 Voltage	500	500	500	volts
DC Grid-No.1 Voltage	-150	-180	-225	volts
Peak RF Grid-No.1 Voltage.	264	327	374	volts
DC Plate Current	300	345	312	ma
DC Grid-No.2 Current	60	60	45	ma
DC Grid-No.1 Current (Approx.)	9	10	9	ma
Driving Power (Approx.)	2.4	3.3	3.4	watts
Power Output (Approx.)	575	800	1000	watts

↓ Subscript 1 indicates that grid-No.1 current does not flow during any part of the input cycle.

● Continuous Commercial Service.

* Averaged over any audio-frequency cycle of sine-wave form.

□ Obtained from a fixed supply.

▲ Total effective grid-No.1-circuit resistance should not exceed 0.25 megohm.

⊞ Subscript 2 indicates that grid-No.1 current flows during some part of input cycle.

** Obtained from fixed supply having a dc resistance not exceeding 250 ohms.

∞ Driver stage should be capable of supplying the No.1 grids of the class AB₂ stage with the specified driving power at low distortion. The effective resistance per grid-No.1 circuit of the AB₂ stage should be held at a low value.

★ At crest of audio-frequency cycle with modulation factor of 1.0.

† Obtained preferably from a separate source modulated along with the plate supply, or from the modulated plate supply through a series resistor.

♦ Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.



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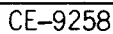
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BEAM POWER TUBE

MAXIMUM RATINGS vs OPERATING FREQUENCY

FREQUENCY	75	100	120	Mc
MAX.-PERMISSIBLE PERCENTAGE OF MAX.-RATED PLATE VOLTAGE AND PLATE INPUT:				
Class B telephony	100	80	60	%
Class C telephony	100	80	60	%
Class C telegraphy	100	80	60	%

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AVERAGE CONSTANT-CURRENT CHARACTERISTICS

