857-B

HALF-WAVE MERCURY-VAPOR RECTIFIER

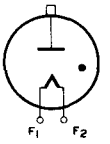
GENERAL DATA

Electrical:

Filamentary Cathode, Coated:		
Voltage	5 ± 5%	ac volts
Current	30	amp
Minimum heating time at rated voltage	60	sec
Peak Tube Voltage Drop (Approx.)	15	volts

Mechanical:

Terminal Connections:



F_1 – Filament (Insulated)

F_2 – Filament, Cathode Shield, Shell (Anode Return)

Cap – Anode

Mounting Position	Vertical with filament end down
Maximum Overall Length (Including flexible leads)	29-7/8"
Seated Length	19-1/2" ± 3/8"
Maximum Diameter	7-1/8"
Weight (Approx.)	4 lbs
Bulb	GT-56
Cap	Skirted Large (JETEC No.C1-10)
Base	Terminal-Support Shell (JETEC No.F0-2)

Temperature Control:

Heating--When the ambient temperature is so low that the normal rise of condensed-mercury temperature above the ambient temperature will not bring the condensed-mercury temperature up to the minimum value of the operating ranges specified under *Maximum Ratings*, some form of heat-conserving enclosure or auxiliary heater will be required.

Cooling--When the operating conditions are such that the maximum value of the operating condensed-mercury temperature range is exceeded, provision should be made for forced-air cooling sufficient to prevent exceeding the maximum value.

Temperature Rise of Condensed-Mercury to Equilibrium Above Ambient Temperature (Approx.):*

No load	11.5	°C
Full load	15	°C

* With filament volts = 4.75 and no heat-conserving enclosure.

← Indicates a change.

RCA

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Maximum Ratings, *Absolute Values*: *For supply frequency of 60 cps*

	Operating Condensed-Mercury Temperature Range		
	25° to 60°C	30° to 40°C	
PEAK INVERSE ANODE VOLTAGE.	10000 max.	22000 max.	volts
ANODE CURRENT:			
Peak	40 max.	40 max.	amp
Average**.	10 max.	10 max.	amp
Fault, for duration of 0.2 second max.	400 max.	400 max.	amp

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Filament Current	1	-	33	amp
Critical Anode Voltage . . .	2	-	100	volts
Peak Tube Voltage Drop . . .	3	-	25	volts

Note 1: With 5 volts rms on filament.

Note 2: With 4.75 volts rms on filament, and condensed-mercury temperature at 25°C, or above.

Note 3: With 5 volts rms on filament, condensed-mercury temperature of 35° ± 5°C, peak anode current of 100 amperes provided by half-cycle pulse from a 60-cps sine wave and recurring approximately once a second. Tube drop is measured by an oscilloscope connected between anode and center tap of filament transformer.

OPERATING CONSIDERATIONS

X-Ray Warning. X-rays are produced when the 857-B is operated with a peak inverse voltage above 16000 volts (absolute value). These rays can constitute a health hazard unless the tube is adequately shielded for X-ray radiation. Although relatively simple shielding should prove adequate, make sure that it provides the required protection to the operator.

Shields and rf filter circuits should be provided for the 857-B if it is subjected to extraneous high-frequency fields during operation. These fields tend to produce breakdown effects in mercury vapor and are detrimental to tube life and performance. When shields are used, special attention must be given to providing adequate ventilation and to maintaining normal condensed-mercury temperature. Rf filters are employed to prevent damage caused by rf currents which might otherwise be fed back into the rectifier tubes.

** Averaged over any period of 30 seconds maximum.

→ Indicates a change.

TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

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HALF-WAVE MERCURY-VAPOR RECTIFIER

For Circuit Figures, see Front of this Section

CIRCUIT	MAX. TRANS. SEC. VOLTS (RMS) E	APPROX. DC OUTPUT VOLTS TO FILTER Eav	MAX. DC OUTPUT AMPERES Iav	MAX. DC OUTPUT KW TO FILTER Pdc
Fig. 1 **Half-Wave** **Single-Phase** In-Phase Operation	15400□ 7000▲	7000 3200	10 10	70 32
Fig. 2 **Full-Wave** **Single-Phase** In-Phase Operation	7700□ 3500▲	7000 3200	20 20	140 64
Fig. 3 **Series** **Single-Phase** In-Phase Operation	15400□ 7000▲	14000 6400	20 20	280 128
Fig. 4 **Half-Wave** **Three-Phase** In-Phase Operation	8900□ 4000▲	10500 4800	30 30	315 144
Fig. 5 **Parallel** **Three-Phase** Quadrature Operation	8900□ 4000▲	10500 4800	60 60	630 288
Fig. 6 **Series** **Three-Phase** Quadrature Operation	8900□ 4000▲	21000 9600	30 30	630 288
Fig. 7 **Half-Wave** **Four-Phase** Quadrature Operation	7700□ 3500▲	10100 4600	*Resistive Load* 36 36	*Inductive Load* 40 40	*Resistive Load* 364 166	*Inductive Load* 404 184
Fig. 8 **Half-Wave** **Six-Phase** Quadrature Operation	7700□ 3500▲	10500 4800	*Resistive Load* 38 38	*Inductive Load* 40 40	*Resistive Load* 399 182	*Inductive Load* 420 192

□ For maximum peak inverse anode voltage of 22000 volts and maximum average current of 10 amperes.

▲ For maximum peak inverse anode voltage of 10000 volts and maximum average current of 10 amperes.

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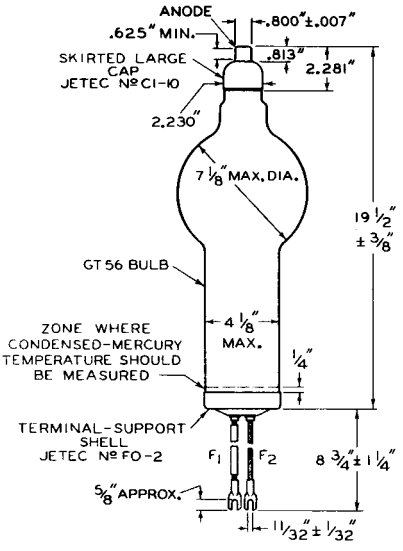

F1 = FILAMENT (INSULATED)
F2 = FILAMENT, CATHODE SHIELD, AND SHELL (ANODE RETURN)

92CM-4649R3

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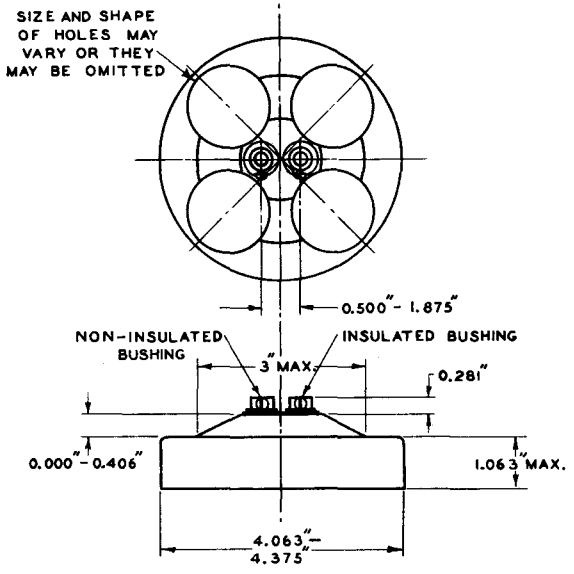
TERMINAL-SUPPORT SHELL



92CS-4653R2

JETEC No. FO-2
RCA No. 3911

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RATE OF RISE OF COND.-MERCURY TEMPERATURE