



869-B

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HALF-WAVE MERCURY-VAPOR RECTIFIER

GENERAL DATA

Electrical:

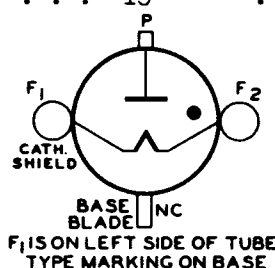
Filamentary Cathode, Coated:

Voltage	$5 \pm 5\%$	ac volts
Current	19	amperes
Minimum Heating Time at Rated Voltage . .	60	seconds
Peak Tube Voltage Drop (Approx.) . . .	15	volts

Mechanical:

Terminal Connections:

F₁—Filament,
Cathode Shield
(Anode Return)



F₂—Filament
Cap—Anode

Mounting Position	Vertical with filament end down
Overall Length	14-1/4" $\pm 3/16$ "
Maximum Diameter	5-1/8"
Bulb	GT-40
Cap	Skirted Large { JETEC No.C1-9 RCA No.3905
Base	{ JETEC No.A3-20 RCA No.3502

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	15	°C
Full Load	20	°C

HALF-WAVE RECTIFIER—In-Phase Operation*

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

Operating Condensed-Mercury
Temperature Range

30° to 60°C 30° to 50°C 30° to 40°C

PEAK INVERSE ANODE VOLTAGE	10000 max.	15000 max.	20000 max.	volts
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*, •: See next page.

NOV. 1, 1952

TUBE DEPARTMENT

DATA 1

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY



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HALF-WAVE MERCURY-VAPOR RECTIFIER

Operating Condensed-Mercury Temperature Range

30° to 60°C 30° to 50°C 30° to 40°C

ANODE CURRENT:

Peak	10 max.	10 max.	10 max.	amp
Average** . . .	2.5 max.	2.5 max.	2.5 max.	amp
Fault, for dura- tion of 0.1 second max.	100 max.	100 max.	100 max.	amp

HALF-WAVE RECTIFIER—Quadrature Operation**

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

Operating Condensed-Mercury Temperature Range

30° to 60°C 30° to 50°C 30° to 40°C

PEAK INVERSE

ANODE VOLTAGE	10000 max.	15000 max.	20000 max.	volts
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ANODE CURRENT:

Peak	20 max.	20 max.	10 max.	amp
Average** . . .	5 max.	5 max.	2.5 max.	amp
Fault, for dura- tion of 0.1 second max.	100 max.	100 max.	100 max.	amp

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Filament Current	1	—	21	amp
Critical Anode Voltage . .	2	—	100	volts
Peak Tube Voltage Drop . .	3	—	17	volts

Note 1: With 5 volts rms on filament.

Note 2: With 4.75 volts rms on filament, and condensed-mercury temperature at 30°C.

Note 3: With 5 volts rms on filament, condensed-mercury temperature of 35±5°C, peak anode current of 50 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.

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

• Filament voltage in phase with anode voltage.

•• Filament voltage out of phase (60° to 120°) with anode voltage.

** Averaged over any period of 30 seconds maximum.

OPERATING NOTES

X-Ray Warning. X-rays are produced when the 869-B is operated with a peak inverse anode voltage above 16000 volts (absolute value). These rays can constitute a health hazard unless the tube is adequately shielded for x-ray radiation.



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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 E _{av}	MAX. DC OUTPUT AMPERES I _{av}	MAX. DC OUTPUT KW TO FILTER P _{dc}		
Fig. 1 Half-Wave Single-Phase In-Phase Operation	14000□ 10600▲ 7000*	6300 4700 3100	2.5 2.5 2.5	16 12 8		
Fig. 2 Full-Wave Single-Phase In-Phase Operation	7000□ 5300▲ 3500*	6300 4700 3100	5.0 5.0 5.0	32 24 16		
Fig. 3 Series Single-Phase In-Phase Operation	14000□ 10600▲ 7000*	12700 9500 6300	5.0 5.0 5.0	64 48 32		
Fig. 4 Half-Wave Three-Phase In-Phase Operation	8100□ 6100▲ 4000*	9500 7100 4700	7.5 7.5 7.5	72 54 36		
Fig. 5 Parallel Three-Phase Quadrature Operation	8100□ 6100▲ 4000*	9500 7100 4700	15.0 30.0 30.0	143 215 143		
Fig. 6 Series Three-Phase Quadrature Operation	8100□ 6100▲ 4000*	19000 14200 9500	7.5 15.0 15.0	143 215 143		
Fig. 7 Half-Wave Four-Phase Quadrature Operation	7000□ 5300▲ 3500*	9000 6700 4500	<i>Resis- tive Load</i> 9.0 18.0 18.0	<i>Induc- tive Load</i> 10.0 20.0 20.0	<i>Resis- tive Load</i> 81 121 81	<i>Induc- tive Load</i> 90 135 90
Fig. 8 Half-Wave Six-Phase Quadrature Operation	7000□ 5300▲ 3500*	9500 7100 4700	<i>Resis- tive Load</i> 9.5 19.0 19.0	<i>Induc- tive Load</i> 10.0 20.0 20.0	<i>Resis- tive Load</i> 91 136 91	<i>Induc- tive Load</i> 96 143 96

For maximum peak inverse anode voltage of 20000 volts, and condensed-mercury-temperature range of 30° to 40°C.

▲ For maximum peak inverse anode voltage of 15000 volts, and condensed-mercury-temperature range of 30° to 50°C.

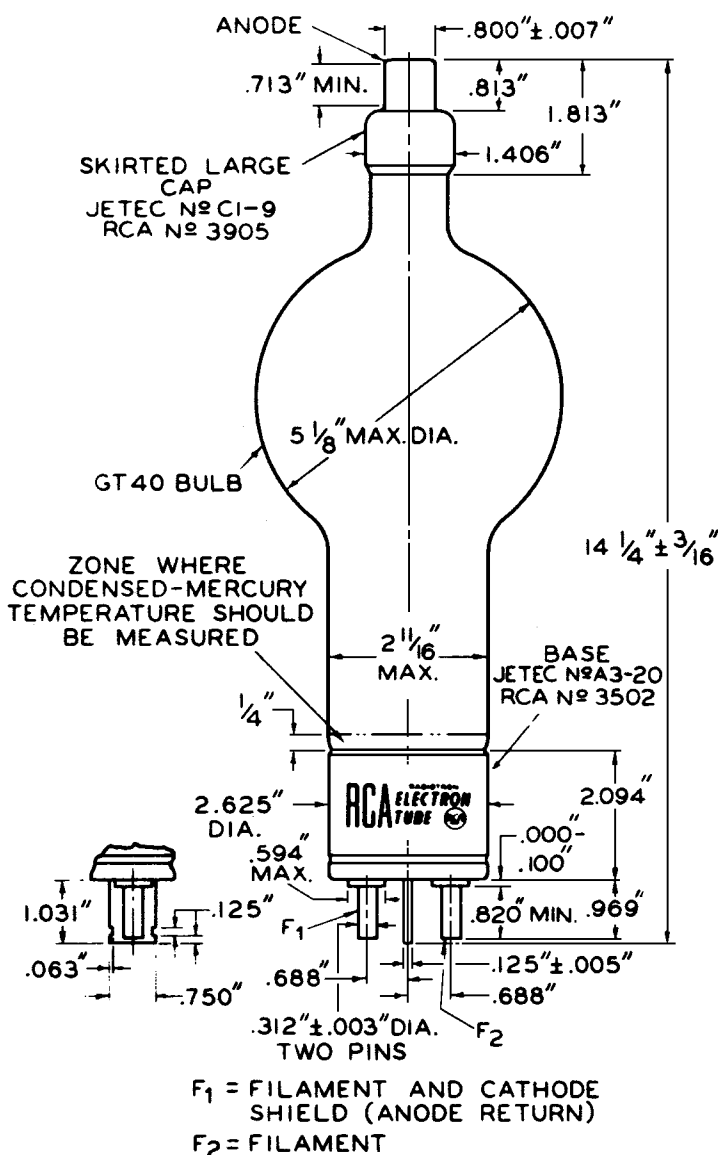
* For maximum peak inverse anode voltage of 10000 volts, and condensed-mercury-temperature range of 30° to 60°C.

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92CM-4330R4

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RATE OF RISE OF COND.-MERCURY TEMPERATURE

