



TECHNICAL
INFORMATION
SERVICE

Technical Information

5AMP — *

CATHODE RAY TUBE

The 5AMP— is a 5" electrostatic focus and deflection cathode ray tube designed for oscilloscope applications. The 5AMP— has very high sensitivity and low capacitance of the vertical deflecting electrodes making the tube well suited for wide band amplifiers with their characteristics low signal output and low capacitance load requirement. The gun features a small spot size of high brilliance, and a low voltage electrostatic focus lens is employed, requiring only a small fraction of the accelerator voltage for focusing.

GENERAL DATA

	5AMP1	5AMP2	5AMP7	5AMP11
Phosphor	#1	#2	#7	#11
Fluorescence	Green	Green	Blue	Blue
Phosphorescence	----	Green	Yellow	----
Persistence	Medium	Long	Long	Short
Focusing Method	Electrostatic			
Deflection Method	Electrostatic			

ELECTRICAL DATA

HEATER CHARACTERISTICS:

Heater Voltage	6.3±10 % volts
Heater Current	0.6 amps.
Peak Heater - Cathode Voltage: ♦	
Heater Negative with Respect to Cathode	180 volts DC
Heater Positive with Respect to Cathode	180 volts DC

DIRECT INTERELECTRODE CAPACITANCES: (μμds) (approx.)

Grid #1 to all other electrodes	4.2
Cathode to all other electrodes	3.8
D1 to D2	3.0
D3 to D4	1.9
D1 to all other electrodes	6.1
D2 to all other electrodes	5.7
D3 to all other electrodes	4.2
D4 to all other electrodes	3.7

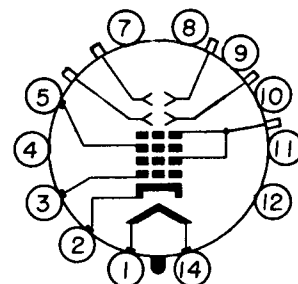
DESIGN CENTER MAXIMUM RATINGS:

Anode Voltage (Note 1)	6000 volts DC
Focusing Voltage	1500 volts DC
Grid #1 Voltage	
Negative Bias Value	200 volts DC
Positive Bias Value	0 volts DC
Positive Peak Value	0 volts
Peak Voltage Between Anode and Any Deflecting Electrode	1200 volts

MECHANICAL DATA

BASE ... Medium Shell Diheptal
12 - Pin
CAPS J1-25

BASING



BOTTOM VIEW

TERMINAL CONNECTIONS:

Pin 1	Heater
Pin 2	Cathode
Pin 3	Grid #1
Pin 4	Internal Connection (do not use)
Pin 5	Focus
Pin 14	Heater
Cap	Anode
Caps	Deflecting Electrodes

* Available in all popular phosphors.



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ELECTRICAL DATA (Cont'd)

CHARACTERISTICS AND TYPICAL OPERATION:

Heater Voltage	6.3 volts
Anode Voltage	2500 volts DC
Focusing Voltage	0 to 300 volts DC
Grid #1 Voltage (Note 2)	-34 to -56 volts DC
Deflection Factors	
D1-D2	40 to 50 volts DC /inch
D3-D4	20 to 25 volts DC/inch
P1 Light Output (Note 3)	15 Ft. L Min.
Modulation (Note 3)	45 Max. volts DC
Line Width A (Note 3)	0.032 inch Max.
Anode Current (Note 3)	800 Microamperes DC Max.
Useful Scan	
D1-D2	4.00 (±2.00 min. from tube face center) inches
D3-D4	2.50 (±1.25 min. from tube face center) inches
Spot Position (Note 7)	Within a 5/16 inch radius circle

DESIGN VALUES:

Focusing Current for any operating condition	-15 to +15 μ Adc
Grid #1 Voltage (Note 2)	-13.6 to -22.4 volts DC per kilovolt of accelerator voltage
Grid #1 Circuit Resistance	
Deflection Factors:	1.5 meg. max.
D1-D2	16 to 20 volts DC/inch/KV of accelerator Voltage
D3-D4	8 to 10 volts DC/inch/KV of anode voltage
Deflection Factor Uniformity (Note 4)	1 % Max.
Pattern Distortion @ 75% of useful scan (Note 5)	2 % Max.
Resistance in any Deflection Electrode Circuit (Note 8)	1 meg. max.
Base Alignment:	
D1-D2 trace aligns with pin #5 and tube axis \pm 10 degrees	
Positive Voltage on D1 deflects beam approximately toward pin #5	
Positive Voltage on D3 deflects beam approximately toward pin #2	
Angle between D3, D4 and D1, D2 traces	

♦ Cathode should be returned to one side or to the mid-tap of the heater transformer winding.

Note 1: The product of anode voltage and average anode current should be limited to 6 watts.

Note 2: Visual extinction of undeflected focused spot.

Note 3: Measured in accordance with MIL-E-1 Specifications.

Note 4: The deflection factor (for both D1, D2, D3 and D4 plate pairs, separately) for any deflection of less than 75% of the useful scan will not differ from the deflection factor for a deflection at 25% of the useful scan by more than the indicated value.

Note 5: All portions of a raster pattern, adjusted so its widest points just touch the sides of a 1.912 x 3.060-inch rectangle, will fall within the area bounded by the 1.912 x 3.060-inch rectangle and an inscribed 1.837 x 2.940-inch rectangle.

Note 6: Deflection accuracy may be obtained by combining angle between traces, deflection factor uniformity and pattern distortion characteristics. In general, for deflections less than those indicated, the accuracy will improve.

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Note 7: When the tube is operated at typical operating conditions ($E_f = 6.3 \text{ V.}$, $E_{b2} = 2500 \text{ V.}$, E_{b1} at focus); E_{c1} adjusted to avoid damage to the screen; with each of the deflecting electrodes connected to the accelerator; and with the tube shielded against external influences, the spot will fall within a $5/16$ inch radius circle, centered on the tube face.

Under stable operating conditions, the position of the spot will not shift with changes in intensity by more than $.025$ inch.

Note 8: It is recommended that the deflecting electrode circuit resistances be approximately equal.

Note 9: An adjusted DC potential between the accelerator and the deflection plates may be used to secure best overall focus.

