

November 24, 1954

Technical Data

T Y P O T R O N *

5-Inch Character-Writing Cathode-Ray-Type Storage Tube

GENERAL:

Heaters (two) for Unipotential Cathodes	
Voltage	6.3 ± 10% ac or dc volts
Current (each heater)	0.6 amp
Phosphor	
Fluorescence and Phosphorescence	Green P1
Persistence of Phosphorescence	Medium
Focusing Method	Electrostatic
Deflection Method, Including Character Selection and Compensation	Electrostatic
Convergence of Characters	Magnetic
Over-all Length	31" Maximum
Seated Height	28-5/8" ± 1/2"
Greatest Diameter of Bulb	5-5/8" Maximum
Neck Diameter	2-1/4" ± 3/32"
Minimum Usable Screen Diameter	4"
Mounting Position	Any**
Base	23-Pin Glass Stem
Pin 1	Anode No. 1 (Writing Gun)
Pin 2	Heater (Flood Gun)
Pin 3	Heater, Cathode (Flood Gun)
Pin 4	Control Grid (Flood Gun)
Pin 5	Matrix Assembly***
Pin 6	Compensating Electrode C ₃
Pin 7	Compensating Electrode C ₄
Pin 8	Compensating Electrode C ₁
Pin 9	Matrix Assembly****
Pin 10	Deflecting Electrode D ₂
Pin 11	Deflecting Electrode D ₁
Pin 12	Compensating Electrode C ₂
Pin 13	Deflecting Electrode D ₃
Pin 14	Deflecting Electrode D ₄
Pin 15	Matrix Assembly****

*Hughes Aircraft Company registered trademark for direct-reading bright-display character-writing storage tube.

**The characters can be made to appear right-side-up on the viewing screen when the tube is mounted with the viewing screen terminal at either the top or the bottom of the face. The subscripts given above for the compensating electrodes and deflecting electrodes apply when the viewing screen terminal (HV Contact) is at the top. To use the other position, the polarities of voltages applied to these electrodes must be reversed, and the direction of the convergence coil current must also be reversed.

***The matrix assembly is connected internally to the conductive coating in the neck.

****Use Pin 5 for socket connection.

from JETEC release #1387, Dec. 20, 1954

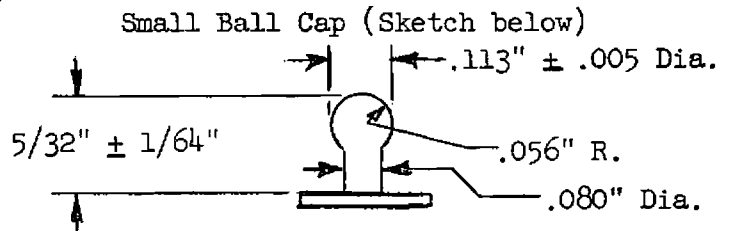
sponsor: Hughes Aircraft Co.

type designation: 6577

- Pin 16 Heater (Writing Gun)
- Pin 17 Heater, Cathode (Writing Gun)
- Pin 18 Selecting Electrode S_1
- Pin 19 Selecting Electrode S_2
- Pin 20 Selecting Electrode S_4
- Pin 21 Selecting Electrode S_3
- Pin 22 Anode No. 2 (Both Guns)
- Pin 23 Control Grid (Writing Gun)

Terminals on Bulb

- Cap No. 1 Viewing Screen
- Cap No. 3 Anode No. 3
- Cap No. 4 Ion Repeller Mesh
- Cap No. 5 Collector Mesh
- Cap No. 6 Storage Mesh



Cap No. 1 is not recessed.
 Caps No. 3, 4, 5 and 6 are partially recessed.

NOTE: For all deflecting plates, subscripts 1 and 2 are nearer the stem, subscripts 3 and 4 are nearer the screen. With S_1 positive with respect to S_2 , the beam is deflected toward the left of the matrix. With S_3 positive with respect to S_4 , the beam is deflected toward the top of the matrix.

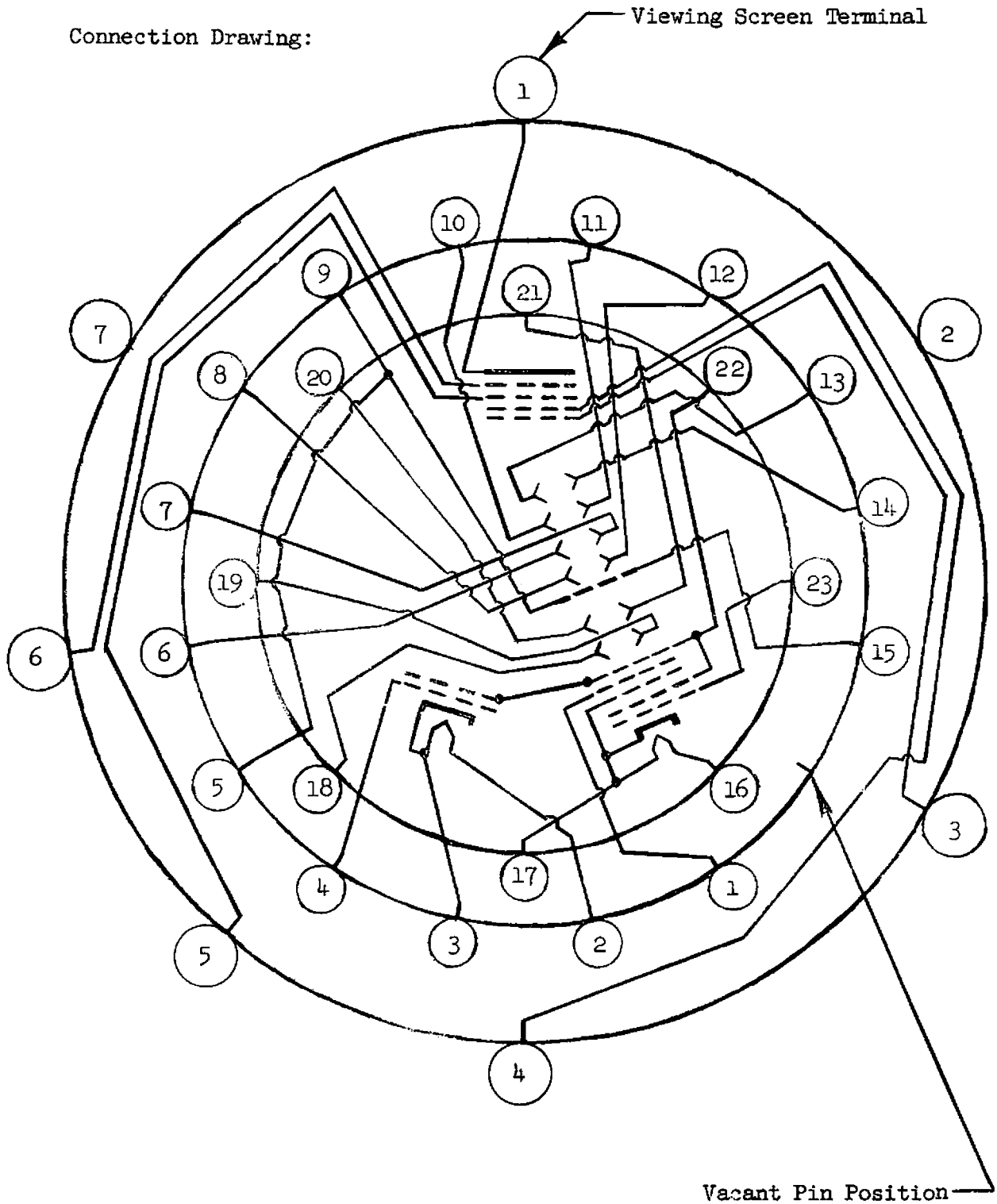
With D_1 positive with respect to D_2 , the beam is deflected toward the left of the screen. With D_3 positive with respect to D_4 , the beam is deflected toward the top of the screen.

The polarity of the voltage required for a given compensation plate is the same as the polarity of the selection plate having the same subscript.

MATRIX CONFIGURATION:

u	f	X	N	T	Y	t	v
i	D	P	I	U	A	E	r
G	L	O	1	2	3	C	J
V	R	4	5	6	7	S	W
Q	M	8	●	9	H	B	Z
b	K	a	p	h	g	F	d
c	m	o	w	e	s	z	n
⊠	▲	▼	—	▲	▼		x

Connection Drawing:



BOTTOM VIEW

MAXIMUM RATINGS:*

Viewing Screen	4000 volts
Ion Repeller Mesh	350 volts
Second Anode	300 volts
Matrix	300 volts
Selection Plates, Average Potential	300 volts
Compensation Plates, Average Potential	300 volts
Deflection Plates, Average Potential	300 volts
Collector Mesh	250 volts
Third Anode	250 volts
Storage Mesh	-50 volts
First Anode	-3400 volts
Cathode Writing Gun	-3400 volts

TYPICAL OPERATING VOLTAGES AND CURRENTS:

Viewing Screen Voltage	3000 volts
Ion Repeller Mesh Voltage	250 volts
Second Anode Voltage	200 volts
Matrix Voltage	200 volts
Selection Plates, Average Potential	200 volts
Compensation Plates, Average Potential	200 volts
Deflection Plates, Average Potential	200 volts
Collector Mesh Voltage, Operating Level**	150 to 200 volts
Third Anode Voltage	150 volts
Storage Mesh Voltage	0 volts
Control Grid (Flood Gun) Voltage, Operating Level***	-50 to -200 volts
First Anode (Writing Gun) Voltage, for Focus****	300 to 800 volts
Cathode (Writing Gun) Voltage	-3100 volts
Control Grid (Writing Gun) Voltage, for Cutoff*****	-40 to -70 volts

* All maximum voltages are given with respect to the flood gun cathode potential and represent the absolute maximum departure from this potential.

** The collector mesh operating level, by definition, is 15 volts above the lowest voltage at which written information remains visible indefinitely on all parts of the viewing screen. This latter voltage has been named the retention threshold.

*** Adjusted for complete coverage of the storage surface.

**** All typical operating voltages are given with respect to the flood gun cathode potential except the control grid (writing gun) voltage and the first anode (writing gun) voltage, which are given with respect to the writing gun cathode potential.

Viewing Screen Current	0 to 300 μ a
Ion Repeller Mesh Current	0 to 4 ma
Second Anode Current	0 to 3 ma
Matrix Current	0 to 3 ma
Collector Mesh Current	-0.5 to +4 ma
Third Anode Current	-0.5 to +2 ma
Storage Mesh Current	-15 to +15 μ a
First Anode (Writing Gun) Current	-5 to +5 μ a
Cathode (Writing Gun), Peak	300 μ a
Convergence Coil Current (Main Coil)	45 to 55 ma*

PROTECTIVE CIRCUITRY:

Power supplies should be of the limited-energy type with inherent regulation to limit the continuous short-circuit currents to the values tabulated below. If the effective output capacitance is capable of storing more than 10 microcoulombs, a resistance not less than the value given below should be provided between the electrode and the output of the power supply. The 100,000 ohms resistance in series with the storage mesh should be provided regardless of output capacitance.

<u>Electrode</u>	<u>Maximum Short Circuit Current</u>	<u>Minimum Resistance</u>
Storage Mesh	3 ma.	100,000 ohms
Collector Mesh	6 ma.	200 ohms
Viewing Screen	1 ma.	100,000 ohms
Writing Gun Cathode	3 ma.	10,000 ohms

STANDARD COMPONENTS:

Convergence Coil	Drawing No. 410157
Socket	Drawing No. 60626

* For convergence coil listed under standard components located on the neck at 18-3/16" from the front of the face to the center of the coil. The coil has bucking fields at each end which require not more than 95% of the main coil current. An adjustment of $\pm 3/4$ " should be provided from the 18-3/16" position on the neck. The convergence coil is designed for use with a magnetic shield having an inside diameter of 5-1/2" to shield the tube from stray magnetic fields.

PERFORMANCE CHARACTERISTICS:

Character Height .125 ± .015 inches

The above character height applies to upper case letters, and other so-called normal size characters in the matrix, projected on the screen.

Registration ±30% of character height

With all adjustments optimized, the composite character produced by superimposing all characters of the matrix has a height and width no greater than 160% of the height of a normal size character.

Selection Factor, at 3.3 KV Cathode-to-Second Anode Voltage

S ₁ and S ₂	28 to 34 volts/character
S ₃ and S ₄	28 to 34 volts/character

Compensation Factor, at 3.3 KV Cathode-to-Second Anode Voltage

C ₁ and C ₂	28 to 34 volts/character
C ₃ and C ₄	28 to 34 volts/character

Deflection Factor, at 3.3 KV Cathode-to-Second Anode Voltage

D ₁ and D ₂	110 to 134 volts/inch
D ₃ and D ₄	101 to 123 volts/inch

Writing Time 40 microseconds maximum

A character can be written on the storage surface by driving the writing gun control grid from beyond cutoff to a voltage at which the instantaneous beam current is 100 microamperes by a rectangular pulse of the above duration.

Erase Time 200 milliseconds maximum

Written information is erased by momentarily lowering the collector mesh voltage below the retention threshold. This is best accomplished by means of a triangular pulse having a slow ascent occupying most of the pulse width.

Brightness of Written Information 10 Foot-Lamberts minimum
with 4 KV on Viewing Screen,
0 volts on Storage Mesh, and
Collector at Operating Level.

