DESCRIPTION:

THE F-7172 IS A 2-1/2 INCH IATRON (DIRECT VIEW STORAGE CATHODE-RAY TUBE) THAT PRODUCES A BRIGHT VISUAL DISPLAY OF ELECTRICALLY STORED INFORMATION. IT IS ELECTROSTATICALLY FOCUSED AND DEFLECTED. IT INCORPORATES A CATHODE-RAY GUN FOR ELECTRICAL SIGNAL INPUT, AN INSULATOR MESH FOR BEAM CHARGE STORAGE, A FLOODING GUN FOR VIEWING AND ERASING, AND AN ALUMINIZED PHOSPHOR VIEWING SCREEN FOR VISUAL OUTPUT. THE LARGE UNDEFLECTED FLOODING BEAM CONTINUOUSLY EXCITES THE 1-7/8 INCH VIEWING SCREEN THROUGH THE INSULATOR MESH AND IS MODULATED IN CROSS-SECTION BY THE STORED SIGNAL CHARGE PATTERN.

SPECIAL FEATURES OF THIS TUBE ARE BRIGHT DAYLIGHT VIEWING OF ELECTRICAL SIGNALS BY IMAGE AMPLIFICATION AND THE ABILITY TO WRITE, STORE, AND ERASE SUCH INFORMATION AT WILL.

USED AS A PANEL-MOUNTED INDICATOR IN AIRCRAFT, ITS FAST WRITING AND HIGH DEFLECTION SPEED PERMITS ACCURATE AND INSTANTANEOUS PRESENTATION OF ELECTRICAL INFORMATION. SINCE COAXIAL ELECTRON GUNS ARE USED IN THE TUBE, THERE IS NO TRAPEZOIDAL DISTORTION OF THE SCANNING PATTERN, AND THE SYMMETRICAL ENVELOPE OCCUPIES MINIMUM SPACE.

DEFLECTION CIRCUITS WITH ADEQUATE POWER TO DEFLECT THE TUBE CAN BE INCLUDED IN THE SPACE BETWEEN THE TUBE NECK AND INDICATOR CASE, AND CONNECTIONS TO THE DEFLECTING ELECTRODES ARE CONVENIENTLY LOCATED IN THE SHOULDER STEM.

ALTHOUGH THE OVER-ALL OPERATING VOLTAGE IS ONLY 4500 VOLTS, SIGNALS ARE DISPLAYED AT A BRIGHTNESS OF 1500 FOOT-LAMBERTS, AND A DISPLAY OF RANDOM DOTS NOT PERCEPTIBLE WITH A CONVENTIONAL CATHODE-RAY TUBE, OR OCCURING WHILE THE OPERATOR'S ATTENTION IS DIVERTED, CAN BE STORED AND VIEWED FOR PERIODS UP TO 30 SECONDS.

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GENERAL:

	Writing Section	Flooding Section	
Heater			
Voltage (ac or dc)	6.3	6.3	Volts
Current	0.6	1.2	Amperes
Direct Interelectrode Capacitances (approx. without external shield)			
Grid #1 to all other Electrodes	4.2		uuf
Cathode to all other Electrodes	0.5		uuf
Deflecting Electrode D1 to D2 Front	3.7		uuf
Deflecting Electrode D3 and D4 Rear	3.3		uuf
D1 to all other Electrodes	4.75		uuf
D2 to all other Electrodes	4.0		uuf
D3 to all other Electrodes	5.0		uuf
D4 to all other Electrodes	4.5		uuf
Focusing method	Electrostatic	Electrostatic	
Deflection Method	Electrostatic	None	
Deflection Sensitivity			
D_1 D_2	36		Volts/inch
D_3 D_4	34		Volts/inch
Phosphor	High-Visual-Efficiency Type (aluminized)		
Fluorescence	Yellow-Green		
Minimum Useful Screen Diameter	1-7/8		Inches
Maximum over-all Length	9-11/16		Inches
Maximum Bulb Diameter	2-3/4		Inches
Maximum Neck Diameter	1-7/16		Inches
Base (neck)	Special 9-Pin		
Shoulder Terminals	Special 8-Pin		
Bulb Terminals	1 Flexible Lead (High Voltage)		
	1 - 7-Pin E7-1 Miniature Base		

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MAXIMUM RATINGS:

	Writing Section	Flooding Section	
Screen Voltage		5000	Volts
Backing Electrode Voltage (Peak)		25	Volts
Collector Voltage		200	Volts
Anode #4 Voltage		100	Volts
Anode #3 (Collimating Electrode) Voltage		50	Volts
Anode #2 (Collimating Electrode) Voltage		50	Volts
Anode #1 Voltage		20	Volts
Grid #3 (Focusing Electrode) Voltage	300**		Volts
Grid #2 Voltage	1100**		Volts
Grid #1 Voltage	**0 to 100		Volts
Cathode Voltage	-1000	0 Reference	Volts
Peak Voltage Between Grid #2 and any Deflecting Electrode	200		Volts
Peak Heater-Cathode Voltage			Volts
Heater Negative with Respect to Cathode	125	125	Volts
Heater Positive with Respect to Cathode	10	10	Volts

OPERATING VALUES AND TYPICAL PERFORMANCE CHARACTERISTICS:

	Writing Section	Flooding Section	
Screen Voltage		4000	Volts
Screen Current (maximum)		0.75	MA
Backing Electrode			
Voltage (DC)		10	Volts
Voltage (pulse)		10	Volts
Collector Voltage		150	Volts
Anode #4 Voltage		75	Volts
Anode #3 Voltage (Adjust for Collimation)		12	Volts
Anode #2 Voltage (Adjust for Collimation)		15	Volts
Anode #1 Voltage		15	Volts
Grid #3 (Adjust for Focus) Voltage	-300 to -325		Volts
Grid #2 Voltage	0		Volts
Grid #1 Voltage	-495		Volts

(Continued)

** All voltages are with reference to the flooding gun cathode except those marked by an asterisk indicating reference to the writing gun cathode potential.

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	Writing Section	Flooding Section	
Deflecting Electrodes			
Voltage (peak to peak)	45		Volts
Voltage (average)	0		Volts
Current (Note 1)	0.5 (max.)		Volts
Cathode Voltage	-450	0 Reference	Volts
Cathode Current		16	ma

RANGE OF OPERATING ADJUSTMENTS:

	Writing Section	Flooding Section	
Backing-Electrode Erasing Voltage Pulses (Note 2)			
Voltages		3 - 10	Volts
Frequency		5000 - 50	pps
Anode #3 Voltage (Note 3)		10 - 20	Volts
Anode #2 Voltage (Note 3)		10 - 20	Volts
Grid #3 Voltage	75 percent ± 5 percent of cathode voltage		
Grid #1 Bias Voltage	3 percent ± 2 percent of cathode voltage		

PERFORMANCE CHARACTERISTICS:

Writing Time (Note 4)	2×10^{-6}	Second
Erasing Time (Note 5)	0.003	Second
Viewing Time (Note 6)	30	Seconds
Stored Spot Size (Note 7)	0.040	Inches
Brightness (Note 8)	1500	Foot-Lamberts

NOTES:

1. Deflecting electrodes intercept flooding beam current reflected at the storage surface. The deflection circuits should therefore have low output resistance.

2. The specified range of pulse frequencies adjusts the viewing time from about 1 to 40 seconds using 0.5 microsecond pulses. The pulse amplitude adjusts the potential level to which the storage surface is erased.

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3. ANODE VOLTAGE ADJUSTMENTS ARE NECESSARY TO ADJUST COLLIMATION AND SPOT SIZE OF THE FLOODING BEAM.

4. THE TIME REQUIRED USING MAXIMUM WRITING BEAM CURRENT AND A FOCUSED STATIONARY BEAM TO WRITE A SPOT TO 90 PERCENT OF MAXIMUM BRIGHTNESS.

5. THE SHORTEST TIME TO REDUCE THE OUTPUT BRIGHTNESS FROM MAXIMUM BRIGHTNESS TO CUTOFF BY ERASING.

6. THE LONGEST TIME DURING WHICH INFORMATION WRITTEN JUST TO THE MAXIMUM BRIGHTNESS LEVEL IN THE USEFUL VIEWING AREA IS STILL VISIBLE UNDER THE CONDITION THAT ERASING PULSES ARE APPLIED CONTINUOUSLY TO THE TUBE.

7. THE DIAMETER MEASURED WITH A MICROSCOPE OF THE DISPLAY OF A STORED SPOT WRITTEN WITH A FOCUSED STATIONARY BEAM TO A BRIGHTNESS OF 90 PERCENT OF MAXIMUM BRIGHTNESS.

8. THE AVERAGE BRIGHTNESS OF THE USEFUL SCREEN AREA WRITTEN TO MAXIMUM BRIGHTNESS USING SPECIFIED TYPICAL OPERATING VOLTAGES.

SPECIAL PRECAUTIONS:

OBSERVE MAXIMUM RATINGS TO AVOID POSSIBLE DAMAGE TO THE TUBE. IN PARTICULAR, THE VIEWING-SCREEN VOLTAGE SHOULD BE LIMITED SO AS NEVER TO EXCEED 6 KILOVOLTS.

THE FULL VOLTAGE SHOULD NOT BE APPLIED TO THE VIEWING SCREEN INSTANTANEOUSLY. AN ORDINARY R-C FILTER AT THE OUTPUT OF THE POWER SUPPLY PROVIDES ADEQUATE ASSURANCE THAT THE VOLTAGE BUILD-UP WILL NOT BE TOO ABRUPT. THE MINIMUM RESISTANCE OF THE HIGH-VOLTAGE LEAD SHOULD BE 1 MEGOHM.

REPEATED BOMBARDMENT WITH A HIGH-CURRENT FOCUSED WRITING BEAM ON A SMALL AREA OF THE STORAGE SURFACE CAN BURN A DARK IMAGE INTO THE DISPLAY WHICH MAY REMAIN FOR SEVERAL HOURS OR EVEN PERMANENTLY. THEREFORE, DEFLECTION VOLTAGES SHOULD BE APPLIED BEFORE OPERATING THE WRITING BEAM.

ATTENTION IS AGAIN CALLED TO THE FACT THAT THE STORAGE SURFACE CAN BE ERASED TO FAR BELOW CUTOFF BY A HIGH-AMPLITUDE VOLTAGE PULSE APPLIED TO THE BACKING ELECTRODE. A LARGE TRANSIENT VOLTAGE ON THAT ELECTRODE CAN PREVENT NORMAL WRITING FOR SEVERAL MINUTES THEREAFTER.

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DEFLECTING ELECTRODES D1 AND D2 CAN ACT AS MIRROR ELECTRODES TO REFLECT FLOODING CURRENT. FLOODING CURRENT REFLECTED AT THE STORAGE SURFACE, RETURNING DOWN THE TUBE, CAN BE REFLECTED BY THE DEFLECTION ELECTRODES AT THE INSTANT WHEN THEIR POTENTIAL PASSES THROUGH ZERO VOLTAGE. THIS RE-REFLECTED AND CONCENTRATED CURRENT CAN THEN TRAVERSE THE LENGTH OF THE TUBE FOR THE THIRD TIME CAUSING A BRIGHT REGION TO APPEAR IN THE DISPLAY AND MAY EVEN ERASE THAT AREA IF ITS ARRIVAL COINCIDES IN TIME WITH AN ERASING PULSE. REFLECTION OF CURRENT BY THE DEFLECTING ELECTRODES IS IN SYNCHRONISM WITH THE DEFLECTING VOLTAGE APPLIED TO THEM SO THAT BRIGHTENING OF THE AFFECTED AREA OF THE DISPLAY OCCURS AT THE SAME FREQUENCY. TO AVOID THIS DISTURBANCE THE HIGHER-FREQUENCY DEFLECTION VOLTAGE SHOULD BE APPLIED TO THE OFFENDING DEFLECTING ELECTRODES D1 AND D2. THIS REDUCES THE DURATION OF THE TRANSIENT CURRENT PULSE TO THE EXTENT THAT ITS EFFECTS ARE NEGLIBIBLE.

WARNING:

THE METAL RING WHICH ENCIRCLES THE FACEPLATE OF THE 7172 IS AT VIEWING-SCREEN POTENTIAL. ALTHOUGH NORMALLY ENCAPSULATED IN PLASTIC AND ADEQUATELY INSULATED FROM METAL GROUND, TO AVOID POSSIBLE SHOCK BE CERTAIN THE HIGH VOLTAGE IS TURNED OFF BEFORE TOUCHING THE TUBE.

ADDITIONAL INFORMATION FOR SPECIFIC APPLICATIONS CAN BE OBTAINED FROM THE

ELECTRON TUBE APPLICATIONS SECTION
ITT COMPONENTS DIVISION
POST OFFICE BOX 412
CLIFTON, NEW JERSEY

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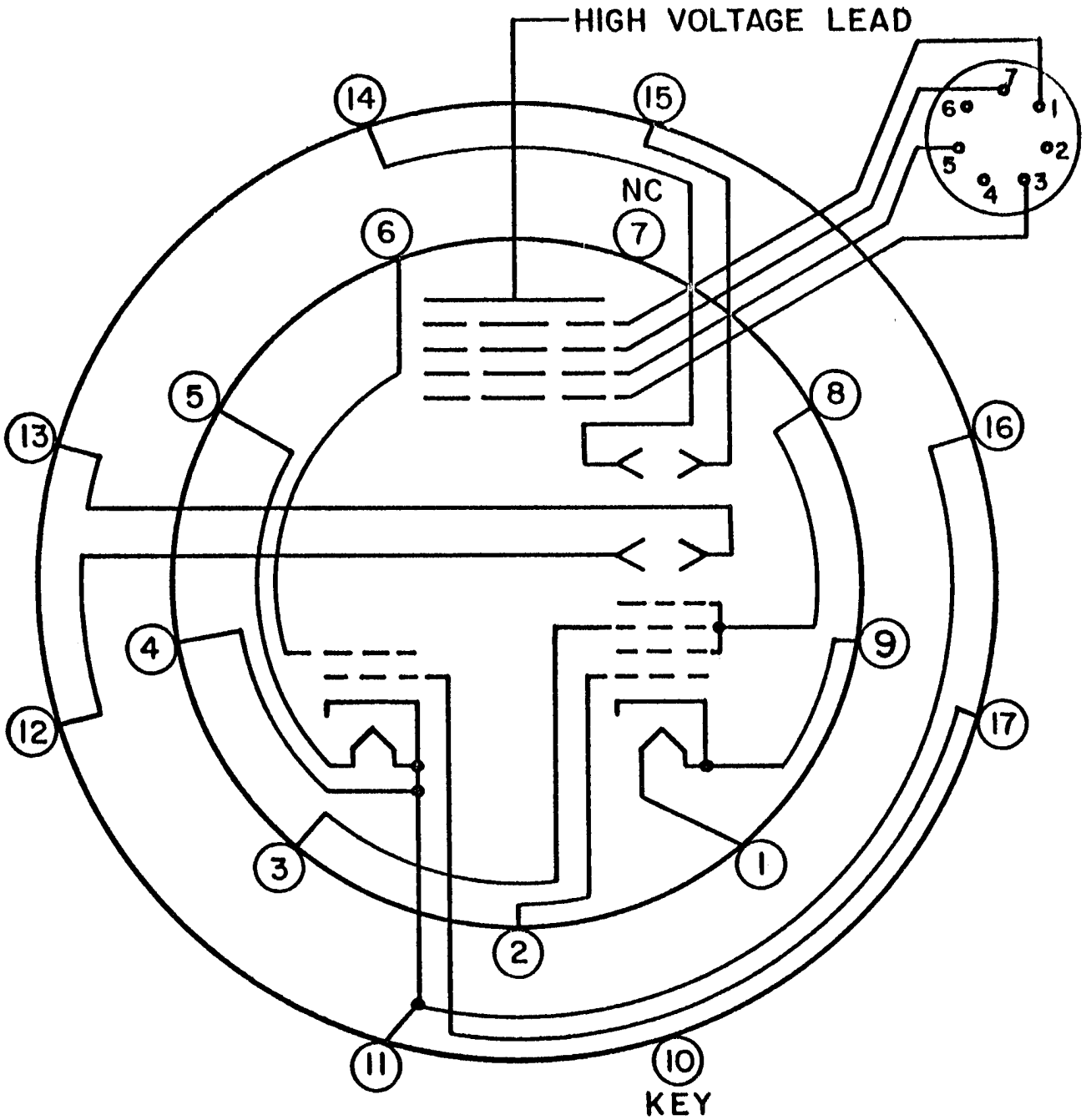

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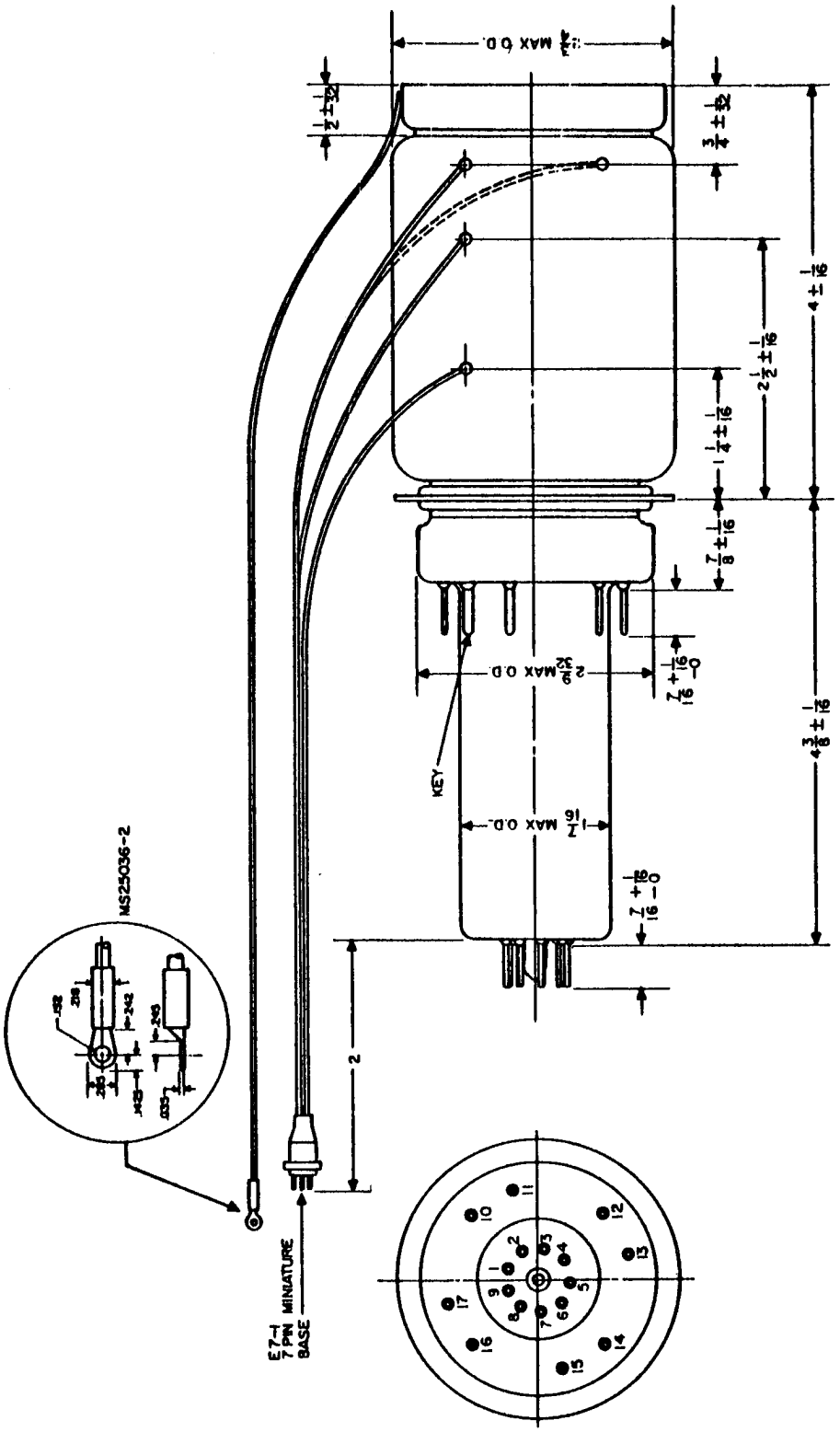
BASING DIAGRAM



F-7172 OUTLINE