H-81-0129

Graphic 8™

COMPUTER GRAPHICS DISPLAY SYSTEM

INSTALLATION MANUAL

SANDERS ASSOCIATES, INC. DANIEL WEBSTER HIGHWAY, SOUTH—NASHUA, NEW HAMPSHIRE 03061

CONTENTS

INTRODUCTION

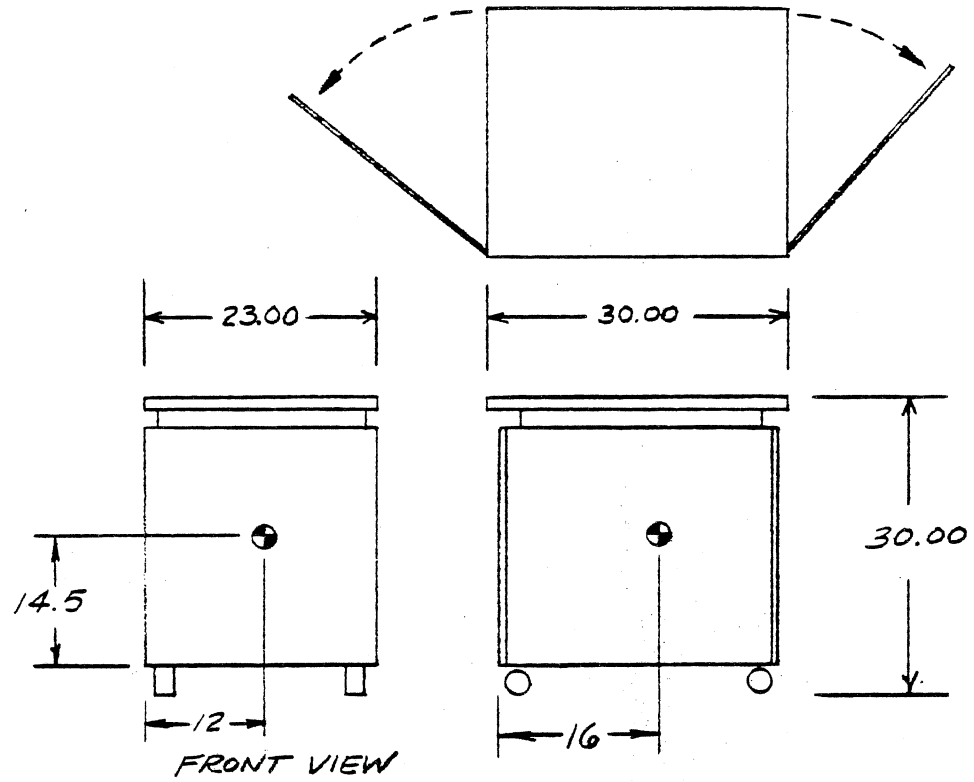
This document contains equipment descriptions, standard cabling information, and connector information for components of a GRAPHIC 8 system.

The equipment descriptions show form, dimensions in inches, service clearance, weight, power requirements, mounting data, and center of gravity.

The standard cabling information includes cable types, part numbers, and typical lengths in feet.

The connector information includes connector type, location, and pin-outs.

EQUIPMENT CABINET



SERVICE CLEARANCES (MIN.)

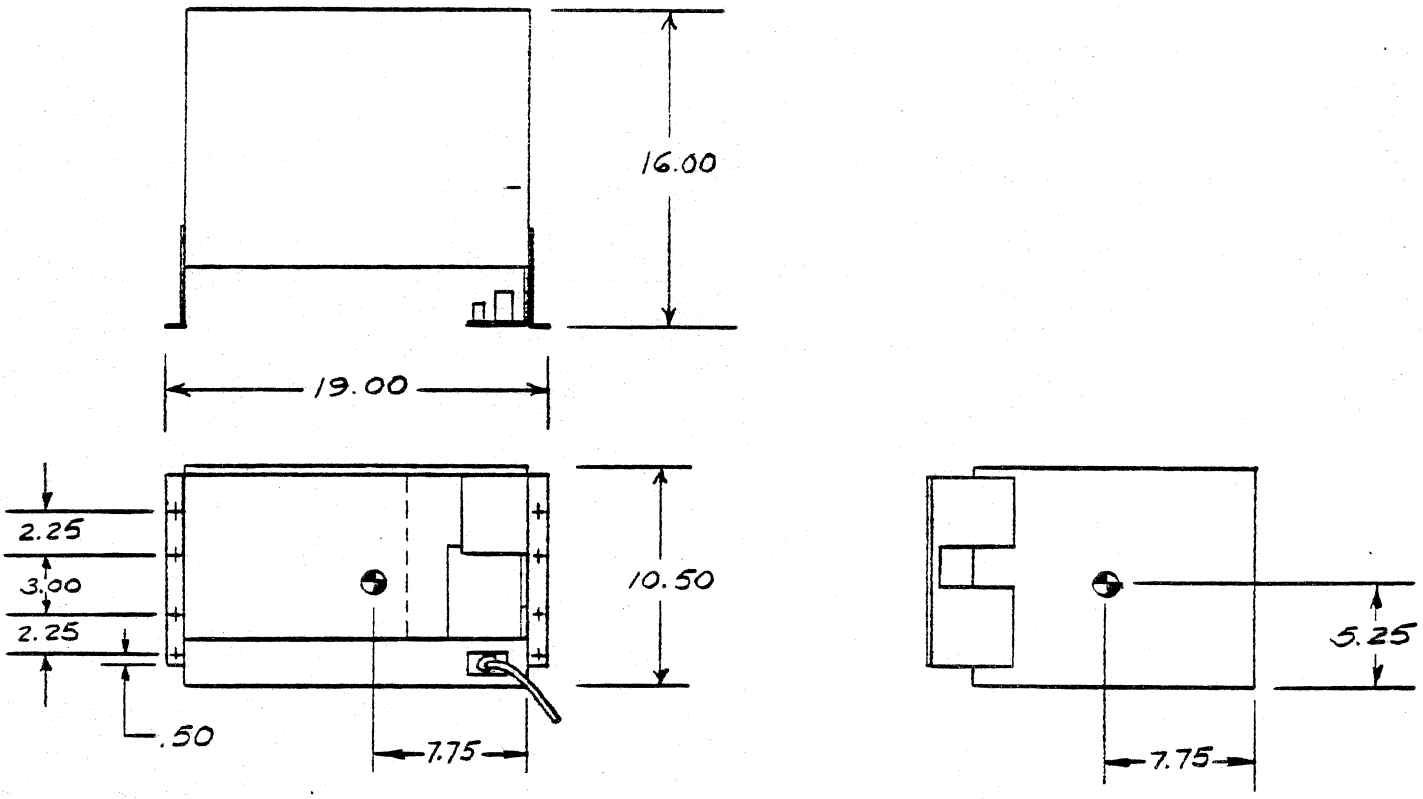
FRONT	30.00
REAR	30.00
LEFT	NONE REQ'D.
RIGHT	NONE REQ'D.

WEIGHT 155 lbs.

MOUNTING

STANDARD 19" ENCLOSED RACK — LOCATED FRONT AND REAR.

⊕ → INDICATES CENTER OF GRAVITY



SERVICE CLEARANCES

- MOUNTS IN STD. 19" EQUIPMENT RACK.

POWER REQUIREMENTS

575 VA

WEIGHT

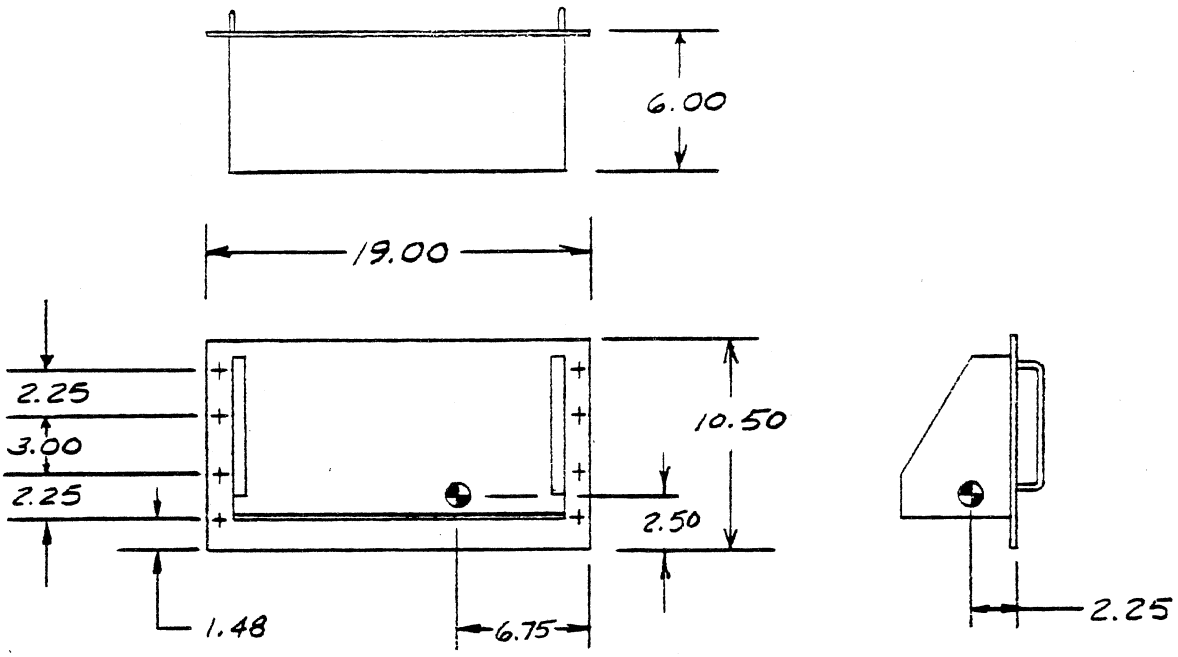
55 LBS.

MOUNTING

- SEE DRAWING ABOVE

◓ → INDICATES CENTER OF GRAVITY

POWER PANEL ASSEMBLY
P/N 597G122G1



SERVICE CLEARANCES

- MOUNTS IN STD. 19" EQUIPMENT RACK.

WEIGHT 35.5 LBS.

POWER REQUIREMENTS

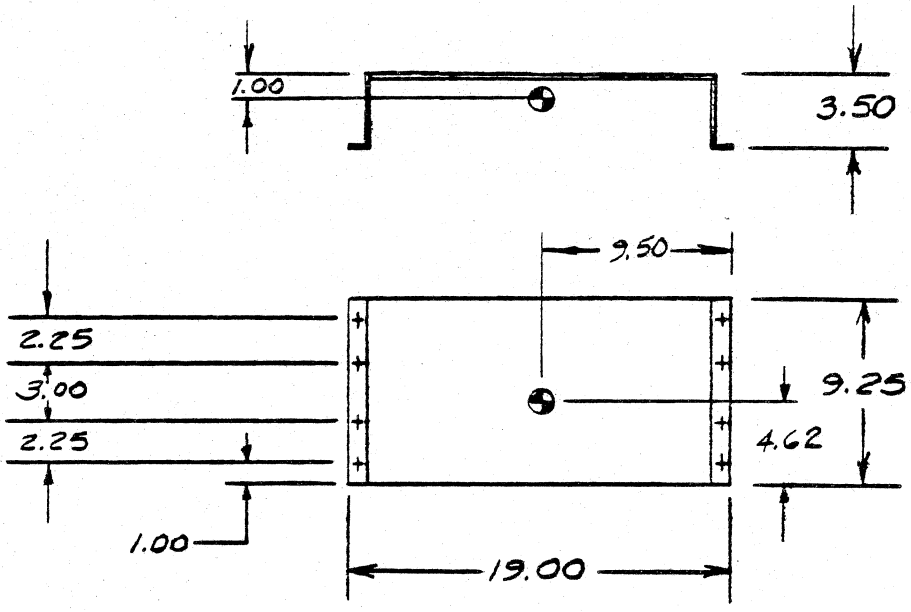
100, 120, 220, 240 VAC

MOUNTING

- SEE DRAWING ABOVE

⊕ ⟶ INDICATES CENTER OF GRAVITY

System Interconnect Panel Assembly
P/N 597G108P1



Service Clearances

- Mounts in Std. 19" Equipment Rack.

Mounting

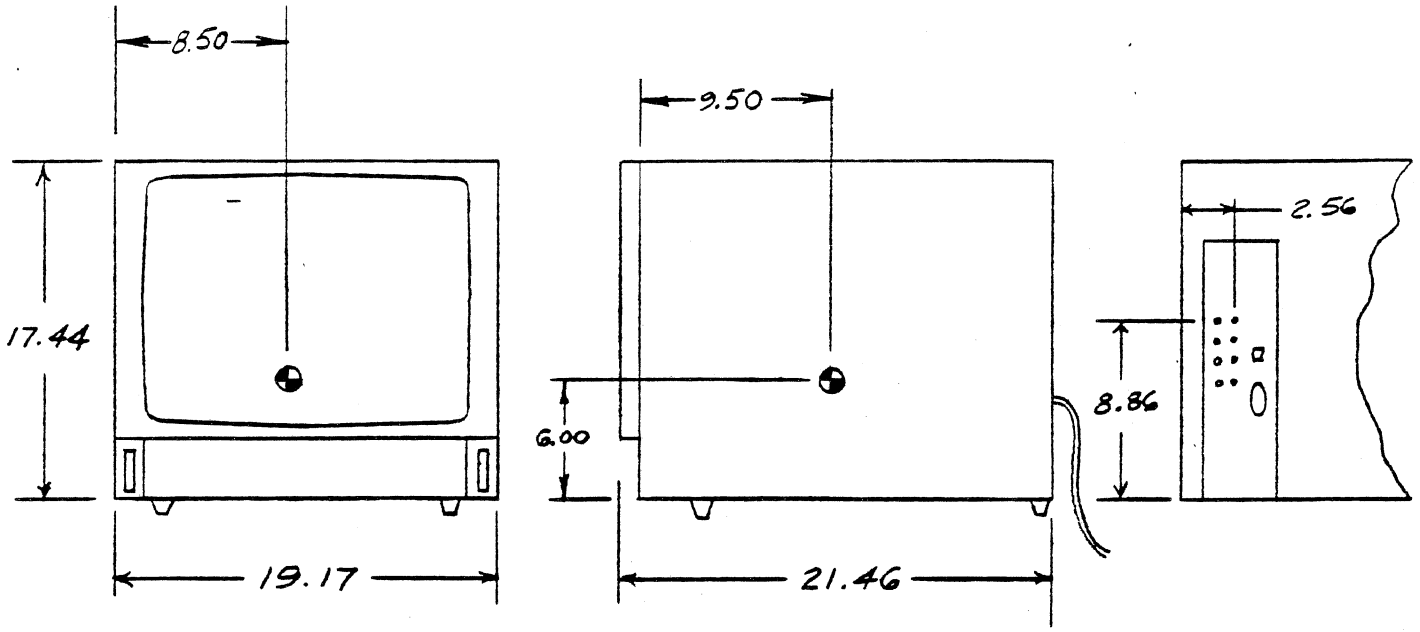
- See Drawing Above

Weight

8 lbs.

⊕ → Indicates Center Of Gravity

Display Monitor
Model 8520



Service Clearances (Min.)

Front	30.00
Rear	6.00
Left	6.00
Right	6.00

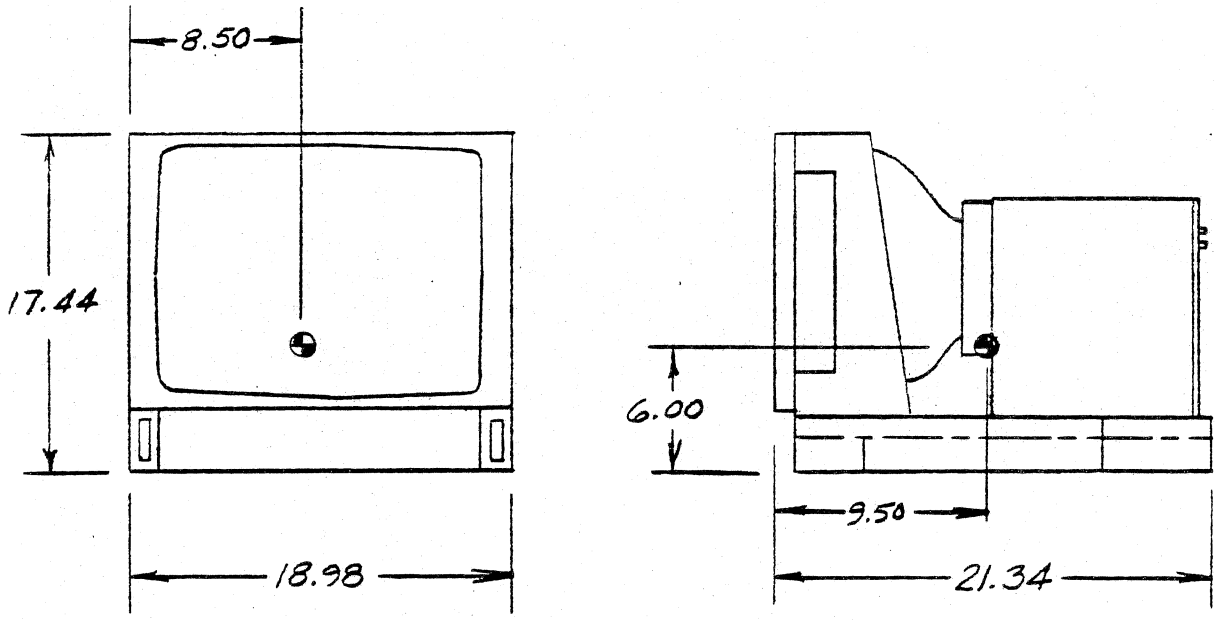
Weight 100 lbs. (Approx.)

Power Requirements

280 VA

⊕ → Indicates Center Of Gravity

Display Monitor
Model 8521



Service Clearances

-Mounts In Std. 19"
Equipment Rack.

Power Requirements

280 VA

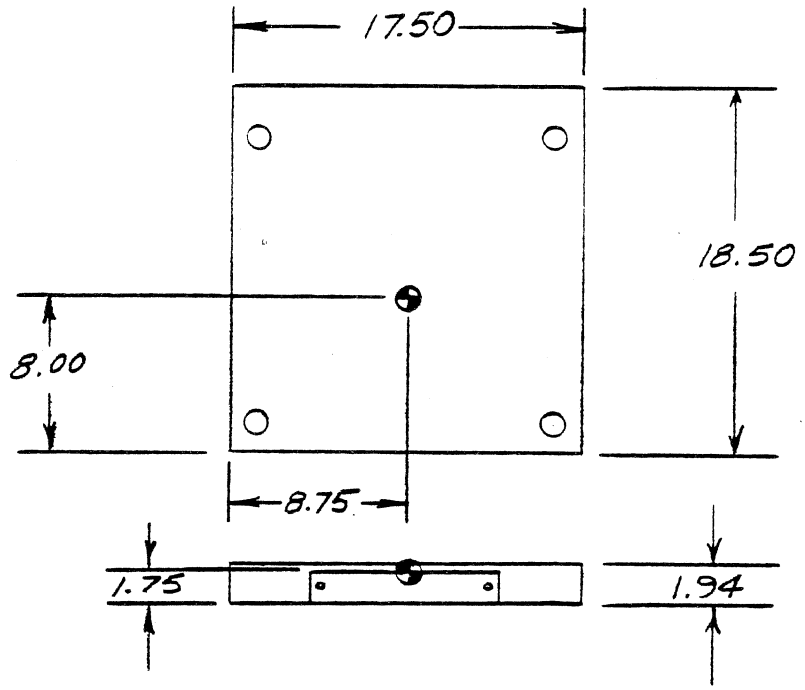
Weight

100 LBS.

● ⟶ Indicates Center Of Gravity

Note: For Rack Mounting
Jonathan Slide P/N 1109D-18-A2 Mounts To
Chassis — No Alterations Required

PEDESTAL ASSEMBLY
P/N 5977295



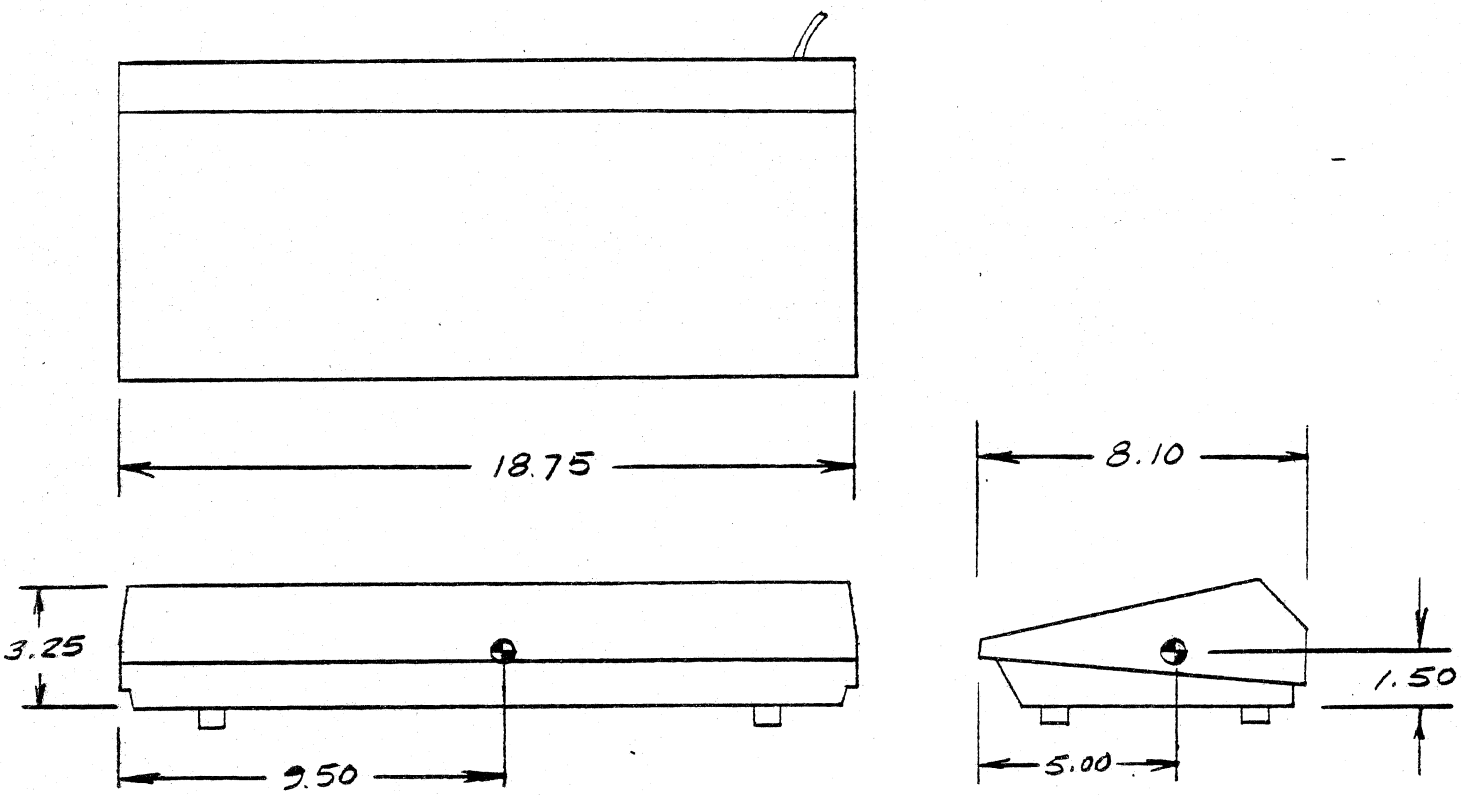
SERVICE CLEARANCES (MIN.)

FRONT	3.00
REAR	3.00
LEFT	NONE REQ'D.
RIGHT	NONE REQ'D

WEIGHT 9 LBS.

⊕ → INDICATES CENTER OF GRAVITY

KEYBOARD
MODEL 5784 OR 5785



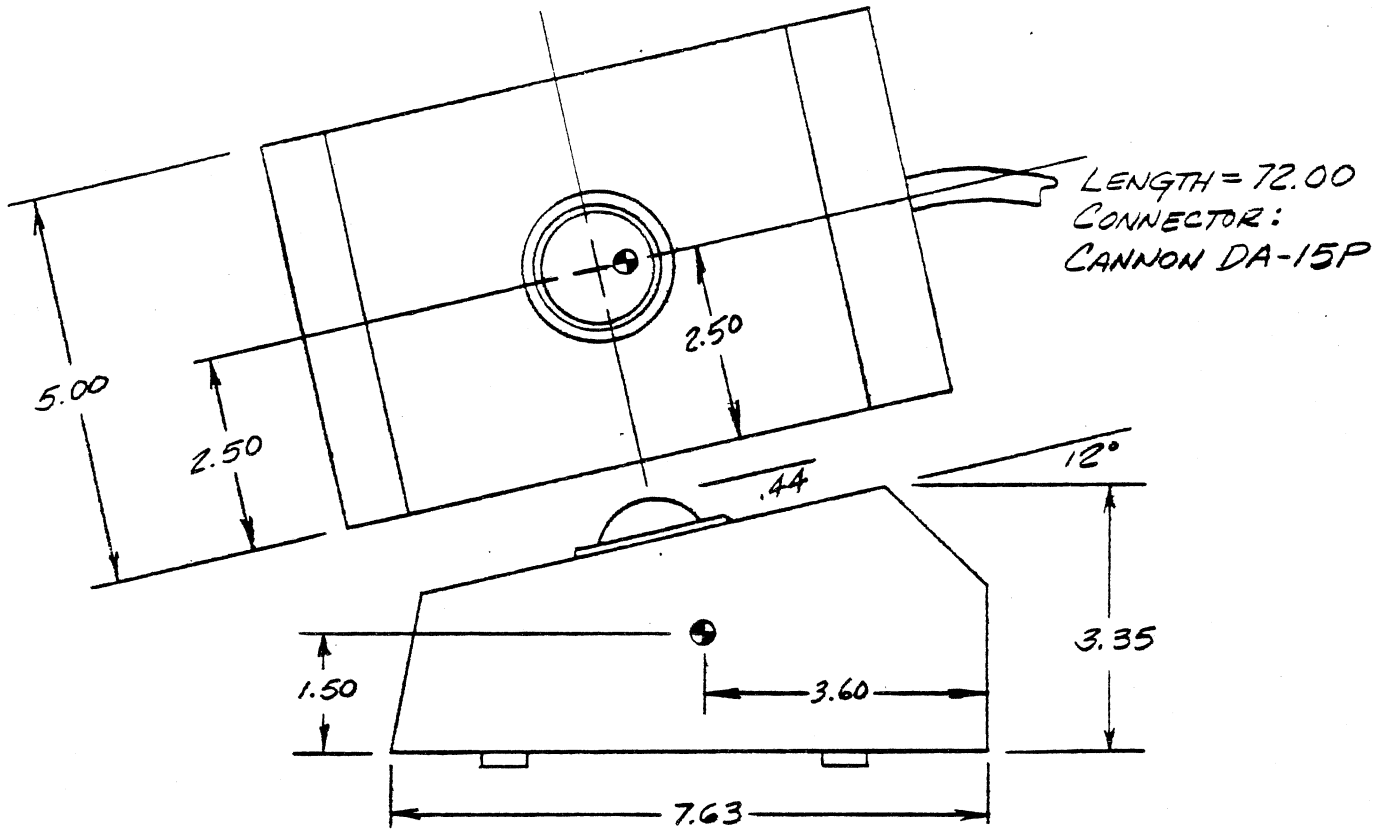
SERVICE CLEARANCES (MIN.)

FRONT	6.00
REAR	3.00
LEFT	6.00
RIGHT	6.00

WEIGHT 7 LBS.

● → INDICATES CENTER OF GRAVITY

TRACKBALL
MODEL 5786



SERVICE CLEARANCES (MIN.)

FRONT	6.00
REAR	6.00
LEFT	NONE REQ'D
RIGHT	NONE REQ'D

POWER REQUIREMENTS

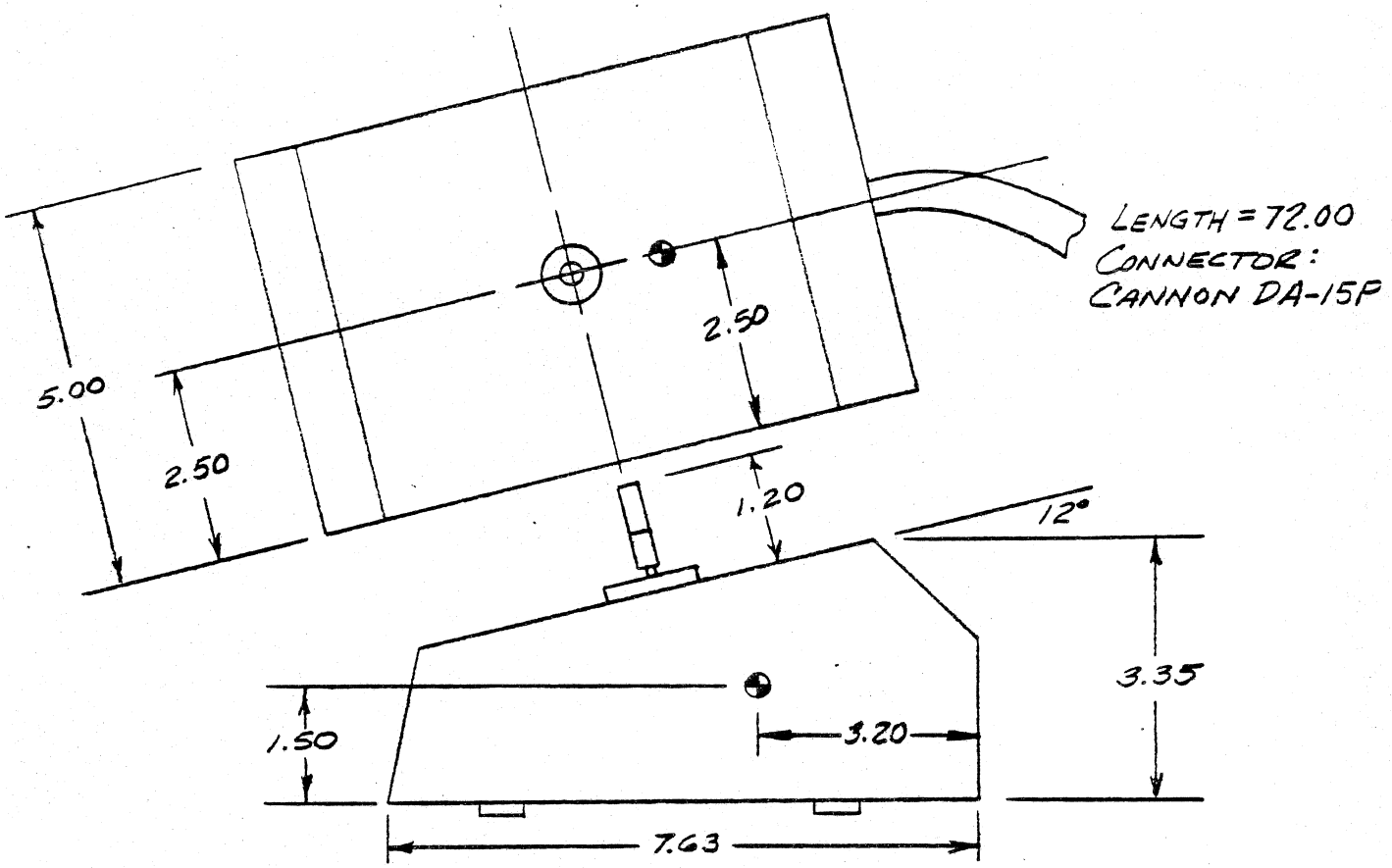
+5 VDC REGULATED ± 1% @ 410 ma
+15 VDC ± .75V AT 25 ma
-15 VDC ± .75V AT 25 ma

WEIGHT

3.5 LBS.

⊕ ⟶ INDICATES CENTER OF GRAVITY

FORCESTICK
MODEL 5787



SERVICE CLEARANCES (MIN.)

FRONT	6.00
REAR	6.00
LEFT	NONE REQ'D.
RIGHT	NONE REQ'D.

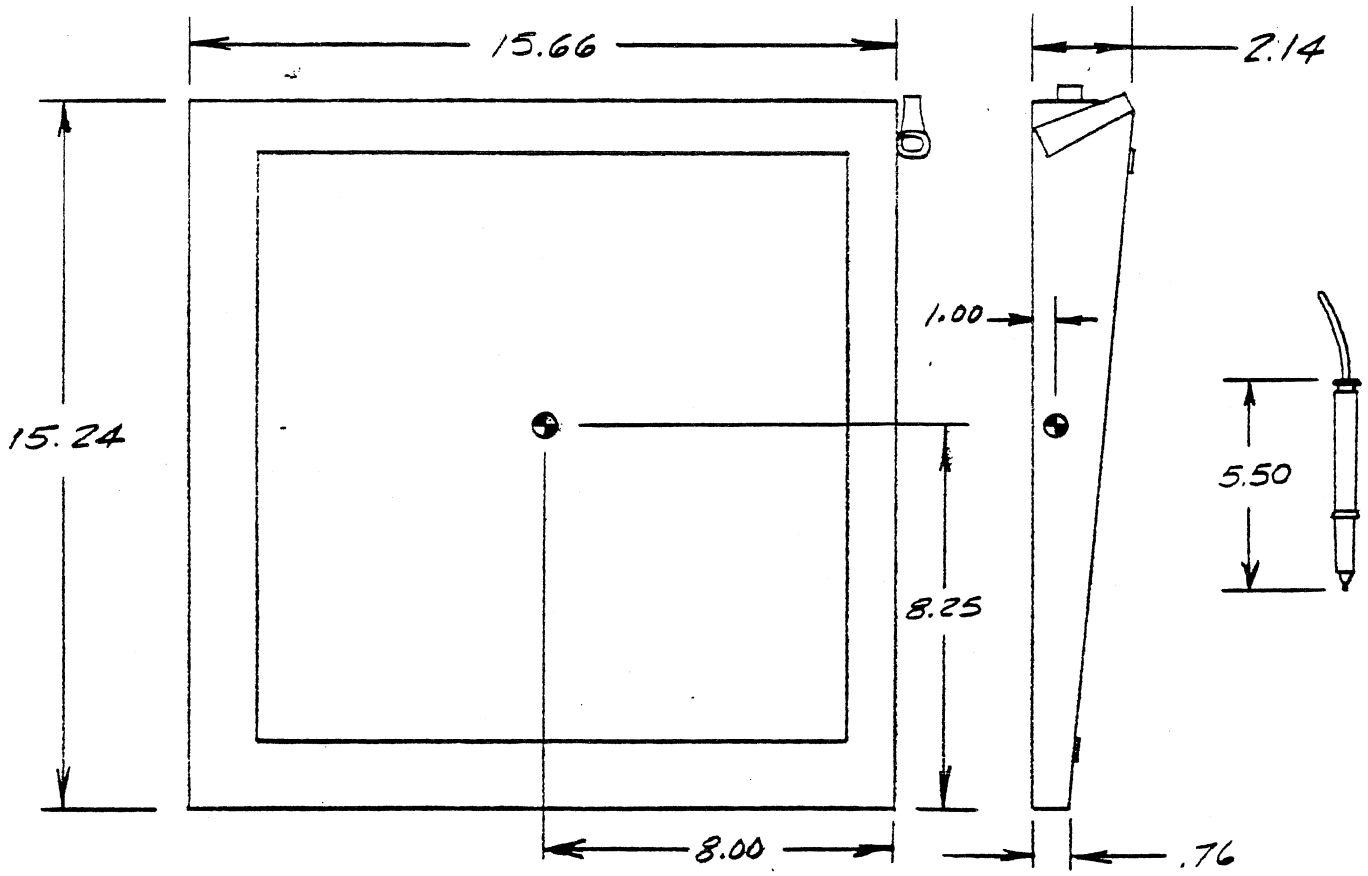
WEIGHT 2.5 LBS.

POWER REQUIREMENTS

+5 VDC REGULATED ± 1% @ 450ma
+15 VDC ± .75V @ 20 ma
-15 VDC ± .75V @ 20 ma

● → INDICATES CENTER OF GRAVITY

DATA TABLET — MODEL 5788



SERVICE CLEARANCES (MIN.)

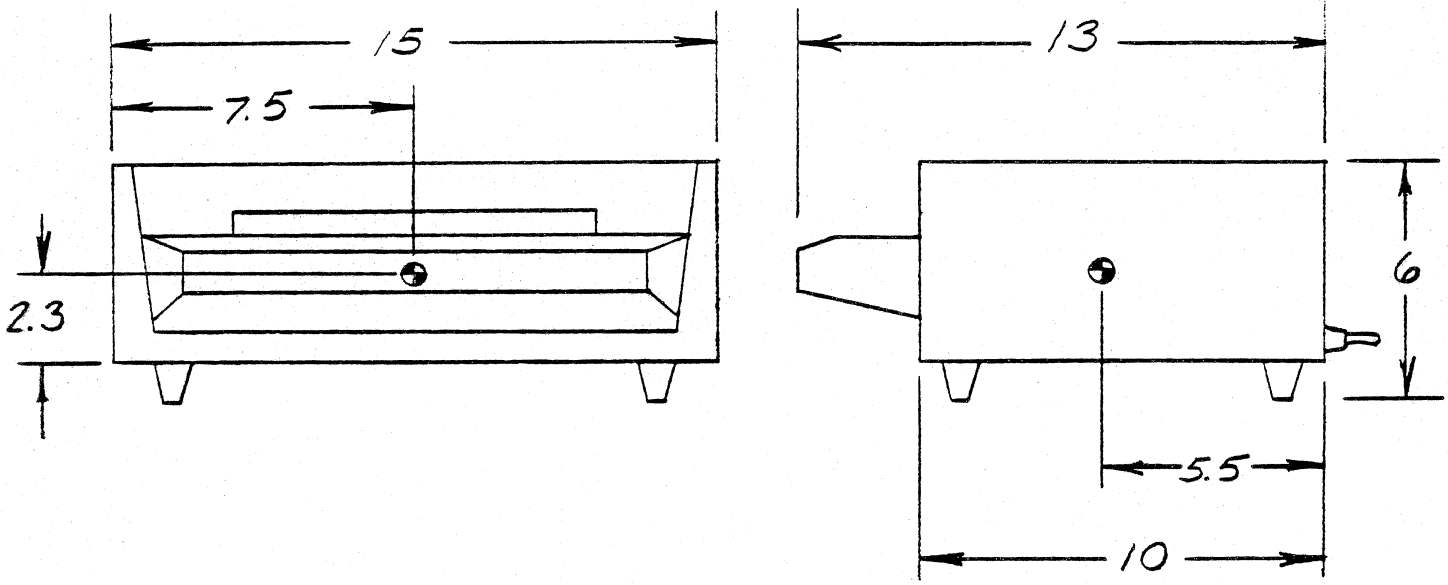
FRONT	6.00
REAR	6.00
LEFT	3.00
RIGHT	3.00

WEIGHT 7.25 LBS.

POWER REQUIREMENTS

15 VDC ± 1% @ .15 a

COLOR FILM PROCESSOR
POLAROID 81-01



SERVICE CLEARANCES (MIN.)

FRONT	12.00
REAR	12.00
LEFT	6.00
RIGHT	6.00

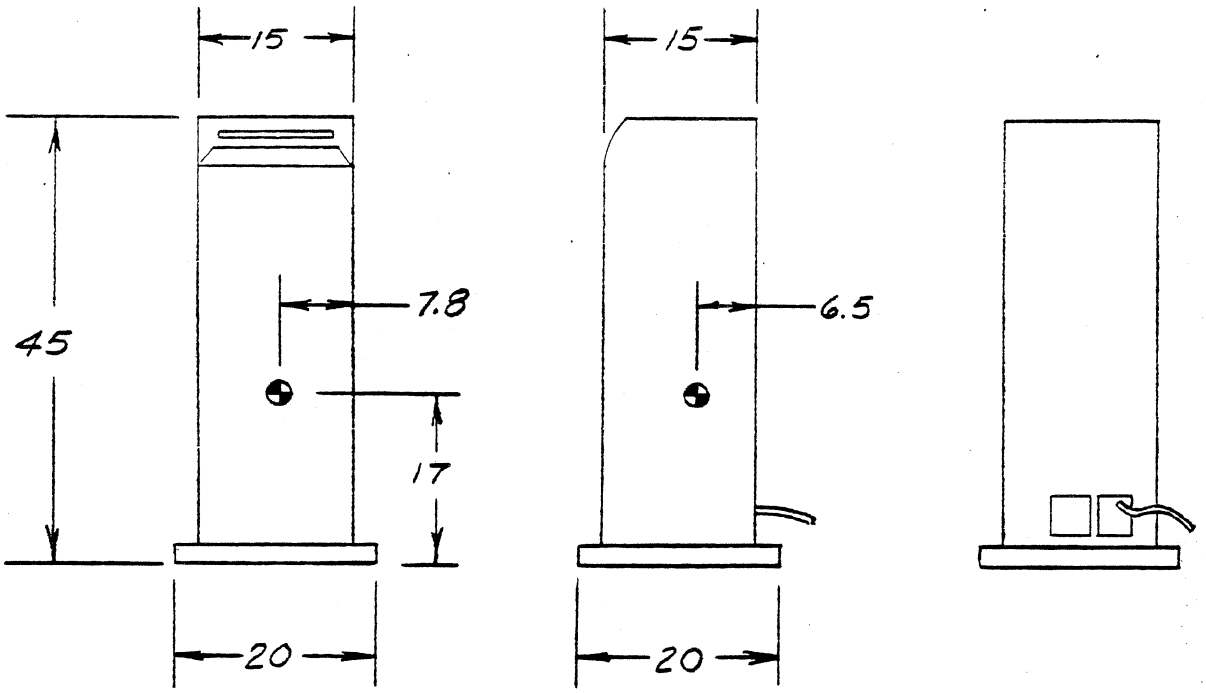
POWER REQUIREMENTS

420 VA

WEIGHT 19.5 LBS.

◓ ——→ INDICATES CENTER OF GRAVITY

COLOR HARD COPY UNIT
DUNN 631



FRONT VIEW

SERVICE CLEARANCES (MIN.)

FRONT	25
REAR	25
LEFT	25
RIGHT	NONE REQ'D.

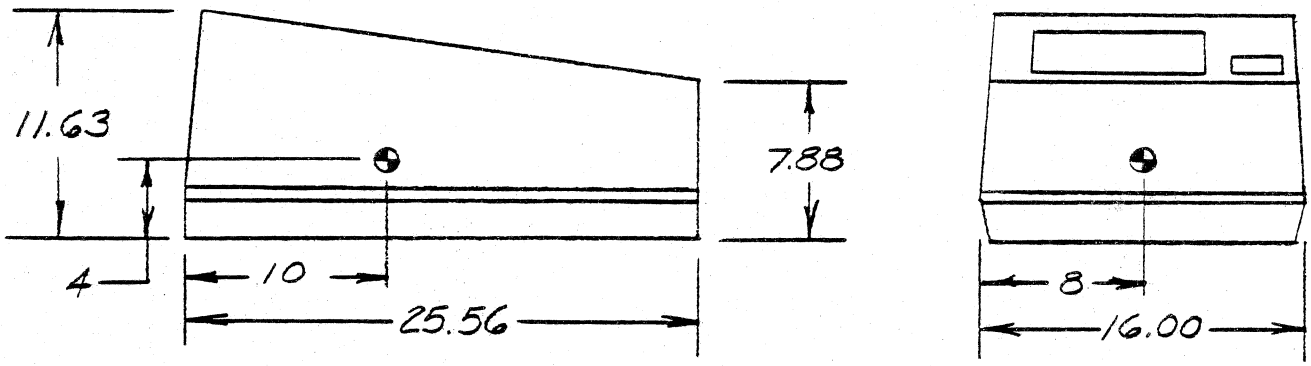
POWER REQUIREMENTS

600 VA

WEIGHT 75 LBS (APPROX.)

◓ → INDICATES CENTER OF GRAVITY

Monochrome Hard Copy Unit
Tektronix 4632



Service Clearances

Front	18.00
Rear	12.00
Left	6.00
Right	6.00

Weight 65 lbs.

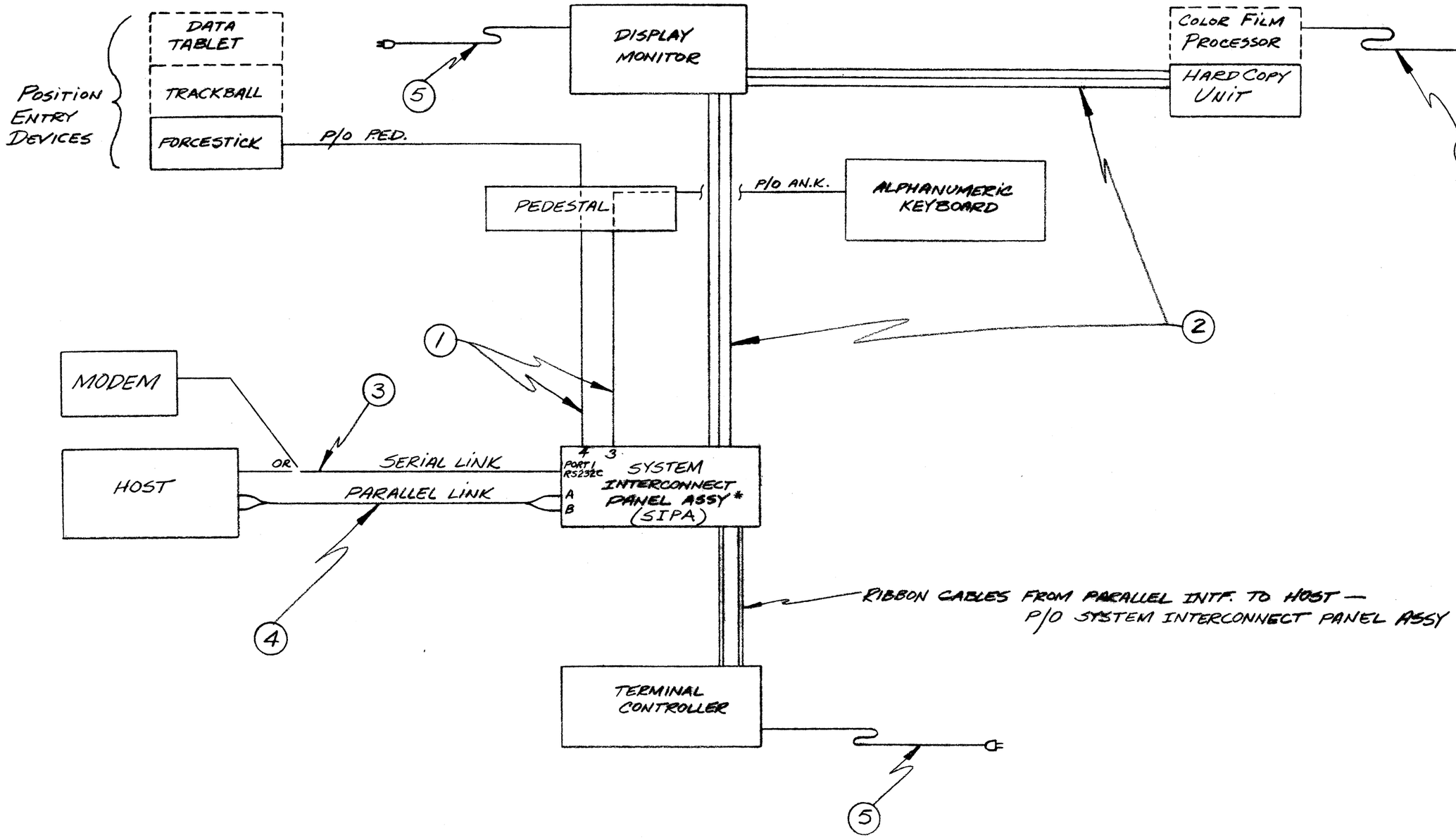
Power Requirements

750 VA

◓ → Indicates Center Of Gravity

TABLE – STANDARD CABLING

NUMBER	FROM	TO	TYPE	PART NUMBER	CABLE LENGTH (ft)
1	PEDESTAL	SIPA	BELDEN 8747	108873761	10
				G11	25
				G5	50
2	DISPLAY MONITOR OR HARD COPY	SIPA DISPLAY MONITOR	75 OHM COAX TYPE RG59U		
			RED + GREEN – PAIR	7010178G11	10
				G13	25
				G1	50
				G2	100
			BLUE – SINGLE	7010179G5	10
				G16	25
				G1	50
				G2	100
3	HOST OR MODEM	SIPA SIPA	RS232-C		
			MALE/FEMALE OR	108958161	25
				G2	50
			MALE/MALE	597617761	25
				G2	50
4	HOST	SIPA	HOST COMPUTER TYPE		
			DEC DR11C	108975661	30
			DEC DR11B	108981462	30
			DEC DR11BD (LONG LINE)	108975463	300
			INTERDATA	108879461	50
			SEL 32 (16 bits)	5977353G9	50
			SEL 32 (32 bits)	5977338G2	50
			DG NOVA/ECLIPSE	5977099G1	10
			HARRIS ABC, CBC, UBC	597634461	30
			H.P. 2100/21 MX	108973961	25
			HONEYWELL 516	1089898G10	50
			NORD 10	108866162	60
			NTDS (FAST-SLOW) UYK-7/15/20	108865762	50
5	USED IN SEVERAL PLACES		BELDEN 17600 POWER CORD OR EQUIVALENT	5976123P1	6 ft. 7 in.



GRAPHIC 8 - STANDARD CABLING

* LABELS INDICATE PORT NUMBER ON SYSTEM INTERCONNECT PANEL

SEE TABLE

CONNECTOR INFORMATION

Refer to drawing 5977307. The following tables define the connectors associated with the GRAPHIC 8 System:

Table 1 - Terminal Controller Cabinet Power Connectors

Table 2 - System Interconnect Panel Connectors

Table 3 - Terminal Controller Card Connectors

Table 4 - Display Indicator Connectors

Table 5 - Keyboard Connector

Table 6 - PED Connectors

Table 1. Terminal Controller Cabinet Power Connectors

CONNECTOR	TYPE	LOCATION	PIN-OUTS
P1	NEMA 5-15P or equivalent (on international models, replace with customer's connector)	Power panel power cord	Line - black Neutral - white Safety ground - green
P2	AMP Inc 2-350804-2	Power panel control cord	2-wire (control, return)
J1	Hubbell	Power panel	3-wire (line, neutral, ground)
J2	5262		

Table 2. System Interconnect Panel Connectors

CONNECTOR	TYPE	PIN-OUTS	
Multiport serial interface port 1 (RS232C)	AMP Inc 206653-1	1 - Protective ground	CGRD1
		2 - Transmitted data	X232-
		3 - Received data	RDA1-
		4 - Request to send	RQTS+
		5 - Clear to send	CLTS+
		6 - Data set ready	DSRY+
		7 - Signal ground	DGND
		8 - Carrier detect	CARR+
		15 - Transmit clock	TSCK+
		17 - Receive clock	RSCK+
		20 - Data Terminal ready	DTRY+
		22 - Ring indicator	RING+
		24 - External clock	TXCO+
Multiport serial interface ports 1, 2, 3, 4	ITT Cannon DAC-15S-FO	1 - Receive data	RDA
		2 - -15 Vdc	N15V-
		4 - Transmit data return	XRTN
		5 - Read enable	RENX-
		6 - 5V return	GND
		7 - 5V return	GND
		8 - Chassis ground	CGND
		9 - Receive data return	RRTN
		10 - +15 Vdc	P15V+
		11 - Transmit data	XMT
		12 - Read enable return	GND
		13 - +5 Vdc	P05V+
		14 - +5 Vdc	P05V+
HOST COMPUTER PARALLEL INTERFACE			
A,B	ITT Cannon DDC-50P	1 - Data bit 0	18 - Bit 8 return
		2 - Bit 0 return	19 - Data bit 9
		3 - Data bit 1	20 - Bit return
		4 - Bit 1 return	21 - Data bit 10
		5 - Data bit 2	22 - Bit 10 return
		6 - Bit 2 return	23 - Data bit 11
		7 - Data bit 3	24 - Bit 11 return
		8 - Bit 3 return	25 - Data bit 12
		9 - Data bit 4	26 - Data 12 return
		10 - Bit 4 return	27 - Data bit 13
		11 - Data bit 5	28 - Bit 13 return
		12 - Bit 5 return	29 - Data bit 14
		13 - Data bit 6	30 - Bot 14 return
		14 - Bit 6 return	31 - Data bit 15
		15 - Data bit 7	32 - Bit 15 return
		16 - Bit 7 return	33 - Spare
		17 - Data bit 8	34 - Spare return

Table 2. System Interconnect Panel Connectors (Cont)

CONNECTOR	TYPE	PIN-OUTS	
HOST COMPUTER PARALLEL INTERFACE (Cont)			
A,B	ITT Cannon (Cont)	35 - ATN1/IMR	43 - ODR
		36 - ATN1/IMR return	44 - ODR return
		37 - OWR/ICTL	45 - NDRY
		38 - OWR/ICTL return	46 - NDRY return
		39 - OMR/IATN2	47 - INIT
		40 - OMR/IATN2 return	48 - INIT return
		41 - OCTL/IWR	49 - Spare
		42 - OCTL/IWR return	50 - Spare return
DISPLAY OUTPUTS	AMP Inc 151-B3800B-75	BNC, coax	

Table 3. Terminal Controller Card Connectors

CONNECTOR	TYPE	PIN-OUTS	
MULTIPORT SERIAL INTERFACE			
J2 (port 1, RS232C)	MINNESOTA MINING 3493-1002	1 - Protective ground	CGRD1
		2 - Transmitted data	X232-
		3 - Received data	RDA1-
		4 - Request to send	RQTS+
		5 - Clear to send	CLTS+
		6 - Data set ready	DSRY-
		8 - Data terminal ready	DTRY+
		10 - Ring indicator	RING+
		12 - External clock	TXCO+
		15 - Transmit clock	TSCK+
		17 - Receive clock	RSCK+
		20 - Signal ground	DGND
		21 - Carrier detect	CARR+
J3,J4,J5, J6 (ports 1,2,3,4)	MINNESOTA MINING 3491-1002	1 - Transmit data	XMT+
		2 - +15 Vdc	P15V+
		3 - Transmit data return	XRTN-
		4 - 5V return	GND
		5 - Receive data	RDA
		6 - +5 Vdc	P05V+
		7 - Receive data return	RRTN
		8 - Read enable return	GND
		9 - Read enable	RENX-
		10 - -15 Vdc	N15V-
PARALLEL INTERFACE			
J2	MINNESOTA MINING 3496-1002 or 3496-3005	1 - Data bit 0	19 - Data bit 9
		2 - Bit 0 return	20 - Bit 9 return
		3 - Data bit 1	21 - Data bit 10
		4 - Bit 1 return	22 - Bit 10 return
		5 - Data bit 2	23 - Data bit 11
		6 - Bit 2 return	24 - Bit 11 return
		7 - Data bit 3	25 - Data bit 12
		8 - Bit 3 return	26 - Bit 12 return
		9 - Data bit 4	27- Data bit 13
		10 - Bit 4 return	28 - Bit 13 return
		11 - Data bit 5	29 - Data bit 14
		12 - Bit 5 return	30 - Bit 14 return
		13 - Data bit 6	31 - Data bit 15
		14 - Bit 6 return	32 - Bit 15 return
		15 - Data bit 7	33 - Test
		16 - Bit 7 return	34 - Ground
		17 - Data bit 8	35 - ATN1
		18 - Bit 8 return	36 - ATN1 return

Table 3. Terminal Controller Card Connectors (Cont)

CONNECTOR	TYPE	PIN-OUTS	
PARALLEL INTERFACE (Cont)			
J2	MINNESOTA MINING (Cont)	37 - OWR	44 - Ground
		38 - Ground	45 - Not used
		39 - OMR	46 - Not used
		40 - OCTL return	47 - INIT
		41 - OCTL	48 - INIT return
		42 - Not used	49 - Test
		43 - ODR	50 - Ground
J3	MINNESTA MINING 3496 -1002 or 3496-3005	1 - Data bit 0	26 - Ground
		2 - Ground	27 - Data bit 13
		3 - Data bit 1	28 - Ground
		4 - Ground	29 - Data bit 14
		5 - Data bit 2	30 - Ground
		6 - Ground	31 - Data bit 15
		7 - Data bit 3	32 - Ground
		8 - Ground	33 - Test
		9 - Data bit 4	34 - Ground
		10 - gGound	35 - IMR
		11 - Data bit 5	36 - Ground
		12 - Ground	37 - ICTL
		13 - Data bit 6	38 - ICTL return
		14 - Ground	39 - ATN2
		15 - Data bit 7	40 - ATN2 return
		16 - Ground	41 - IWR
		17 - Data bit 8	42 - Ground
		18 - Ground	43 - Not used
		19 - Data bit 9	44 - Not used
		20 - Ground	45 - NDRY
		21 - Data bit 10	46 - Ground
		22 - Ground	47 - Not used
		23 - Data bit 11	48 - Not used
		24 - Ground	49 - Test
		25 - Data bit 12	50 - Ground
ROM AND STATUS			
J2	MINNESOTA MINING 3491-1002	1 - Transmit data	XMT+
		2 - +15 Vdc	P15V+
		3 - Transmit data return	DRET-
		4 - Ground	DRET-
		5 - Receive data	RDAT+
		6 - +5 Vdc	P05V+
		7 - Ground	DRET-
		8 - Ground	DRET-
		9 - Read enable	RENX-
		10 - -15 Vdc	N15V-

Table 3. Terminal Controller Card Connectors (Cont)

CONNECTOR	TYPE	PIN-OUTS	
DIGITAL GRAPHIC CONTROLLER			
J1 (used for test and debug)	PASSIVE MICROWAVE 3432-1002	1 - CR0	21 - RB78
		2 - CR1	22 - RB79
		3 - CR2	23 - RB50
		4 - CR3	24 - RB51
		5 - CR4	25 - RB52
		6 - CR5	26 - RB53
		7 - CR6	27 - RB54
		8 - CR7	28 - RB55
		9 - CR8	29 - RB56
		10 - CR9	30 - RB57
		11 - CR10	31 - RB58
		12 - RB69	32 - RB59
		13 - RB70	33 - RB60
		14 - RB71	34 - RB61
		15 - RB72	35 - Ground
		16 - RB73	36 - +5V
		17 - RB74	37 - +5V
		18 - RB75	38 - Ground
		19 - RB76	39 - RB62
		20 - RB77	40 - Clock
J2 (used for test and debug)	PASSIVE MICROWAVE 3432-1002	1 - DB0	21 - RB13
		2 - DB1	22 - RB14
		3 - DB2	23 - RB15
		4 - DB3	24 - RB16
		5 - DB4	25 - GCADD
		6 - DB5	26 - MAP-
		7 - DB6	27 - RB49
		8 - DB7	28 - RB48
		9 - DB8	29 - RB22
		10 - DB9	30 - RB65
		11 - DB010	31 - RB66
		12 - DB011	32 - RB67
		13 - DB12	33 - RB68
		14 - DB13	34 - RB34
		15 - DB14	35 - RB35
		16 - DB15	36 - RB36
		17 - RB9	37 - RB37
		18 - RB10	38 - RB38
		19 - RB11	39 - RB39
		20 - RB12	40 - RB40
J3 (used for test)	AMP Inc 87230-2	1 - Clear bus busy flip-flop	
		2 - GRA0+H	
		3 - Not used	
		4 - Not used	

Table 3. Terminal Controller Card Connectors (Cont)

CONNECTOR	TYPE	PIN-OUTS
VIDEO CONTROLLER		
J1	Sanders Assoc. 7012774P1	BNC (External video in)
J2-J7	Sanders Assoc. 7012774P1	BNC (Outputs to displays)
TIMING MODULE		
J1-J7	Sanders Assoc. 7012774P1	BNC J1 = VIDEO 2 IN J2 = VIDEO 2 OUT J3 = VIDEO 1 IN J4 = VIDEO 1 OUT J5 = CSYNC J6 = HSYNC J7 = VSYNC

Table 4. Display Indicator Connectors

CONNECTOR	TYPE	PIN-OUTS
Refer to Sanders document H-81-0120		

Table 5. Keybord Connector

CONNECTOR	TYPE	PIN-OUTS
P1	DAC-15P	1 - Serial data from keyboard 2 - -15V 3 - Not used 4 - Return for pin 11 5 - Not used 6 - Power return 7 - Power return 8 - Chassis (safety) ground 9 - Return for pin 1 10 - +15V 11 - Serial data to keyboard 12 - Not used 13 - +5V 14 - +5V

Table 6. PED Connectors

CONNECTOR	TYPE	PIN-OUTS
P1	ITT Cannon DA-15P	1 - Serial data out 2 - -15V 3 - Not used 4 - Ground 5 - Test in 6 - Ground 7 - Not used 8 - Spare 9 - Ground 10 - +15V 11 - Not used 12 - Not used 13 - +5V 14 - Not used 15 - Not used

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Software/Firmware System _____

Version _____

Host computer _____

Host operating system _____ Version _____

Host-GRAPHIC 7 interface _____

My problem is: hardware ☐ software ☐

firmware ☐ manual ☐

Description of problem (or suggestion for improvement):

Related tech manual number _____