

# Film-Tech

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OPERATING MANUAL

MODEL 1000  
INTEGRATED XENON LAMPHOUSE  
AND POWER SUPPLY

OPTICAL RADIATION CORPORATION  
6352 N. IRWINDALE AVENUE  
AZUSA, CALIFORNIA 91702

D113231

REVISED FEBRUARY 1977

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## SECTION 1 - INTRODUCTION

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### 1.1 SCOPE

This manual provides installation, operation and maintenance instructions for the Model 1000 ORCON Xenon Light Projection System. The system is manufactured by Optical Radiation Corporation (ORC), Azusa, California, U.S.A. When requesting information, always furnish model and serial numbers.

### 1.2 GENERAL DESCRIPTION (See Figure 1-1)

The ORCON Model 1000 is designed with the lamphouse and power supply integrated into the same housing. This eliminates the need for hook-up and location of an external power supply. The system is designed for use with 35mm or 16mm motion picture projectors. It operates from 115 VAC single phase power source and draws a maximum input current of 18 amps RMS. The system is equipped with an 8 foot long power cord and a NEMA L5-20, 125 VAC, 20 amp, 3 prong plug. It is designed to operate with both the XL-750W and XL-1000W xenon bulbs. The power supply has DC current regulation in the order of 1% which maintains a current setting independent of line voltage fluctuations. In addition to current regulation, the system is filtered to provide less than 3% RMS current ripple. Lamp current can be continuously adjusted by means of a potentiometer on the rear panel of the lamphouse. Current range is from 17 to 40 amps. Current adjustment is accomplished by controlling the firing angle of a pair of SCR's on the primary side of the power transformer. A current sensing circuit maintains the firing angle of the SCR's constant at the corresponding current setting, providing current regulation.

### 1.3 SPECIFICATIONS

Table 1-1. System Specifications, Model 1000

<u>ITEM</u>	<u>CHARACTERISTIC</u>
Input Current (when operating from 115 VAC:	18 Amps @ 40 Amps DC
Open Circuit Voltage:	120V DC
Weight:	85 Pounds
Dimensions - High:	16½ inches
Wide:	9½ inches
Long:	19½ inches
Current Range:	17 to 40 Amps
Current Ripple:	Less than 3%
Current Regulation:	Less than 1%

### 1.4 OPTICAL SYSTEM

The optical system includes a xenon bulb mounted horizontally in a metal aspheric reflector. The reflector collects the emitted light from the bulb and reflects it to the projector's aperture. A manually operated douser is located inside the lamphouse just behind the front bulkhead (see Figure 1-1).

### 1.5 XENON BULB (XL-750W & XL-1000W)

The xenon bulb is manufactured by Optical Radiation Corporation and is specifically designed for stable operation over a wide current range.

## 1.6 REFLECTOR

The reflector is a complex aspheric surface made of electro-formed nickel and coated with aluminum. It is good for the life of the system and does not require replacement in the event of a bulb explosion.

## 1.7 DOUSER

The built-in douser is operated by a handle on the right side of the lamphouse (see Figure 1-1). The douser is provided to close off light to the projector while the xenon bulb is operating. An optional solenoid powered remote control douser is available.

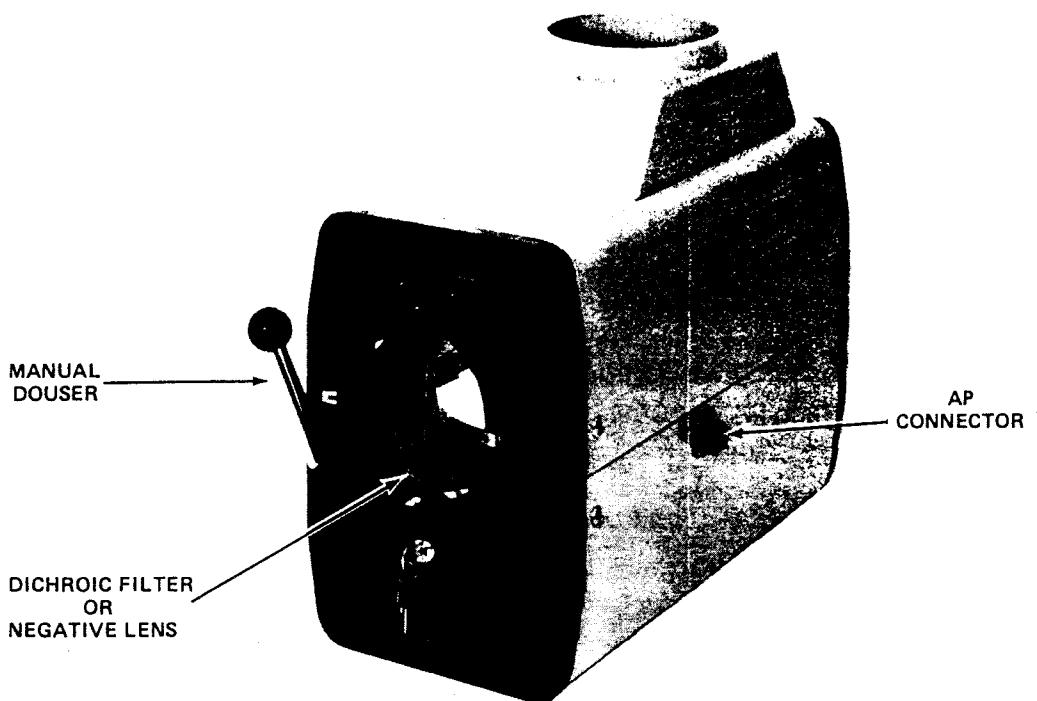
## 1.8 MOUNTING PLATE

For 35 mm projection, it is recommended that the swivel mounting plate be used. This mounting plate attaches to the bottom of the lamphouse and adapts the lamphouse to a nine-inch optical centerline (see Figure 3-1).

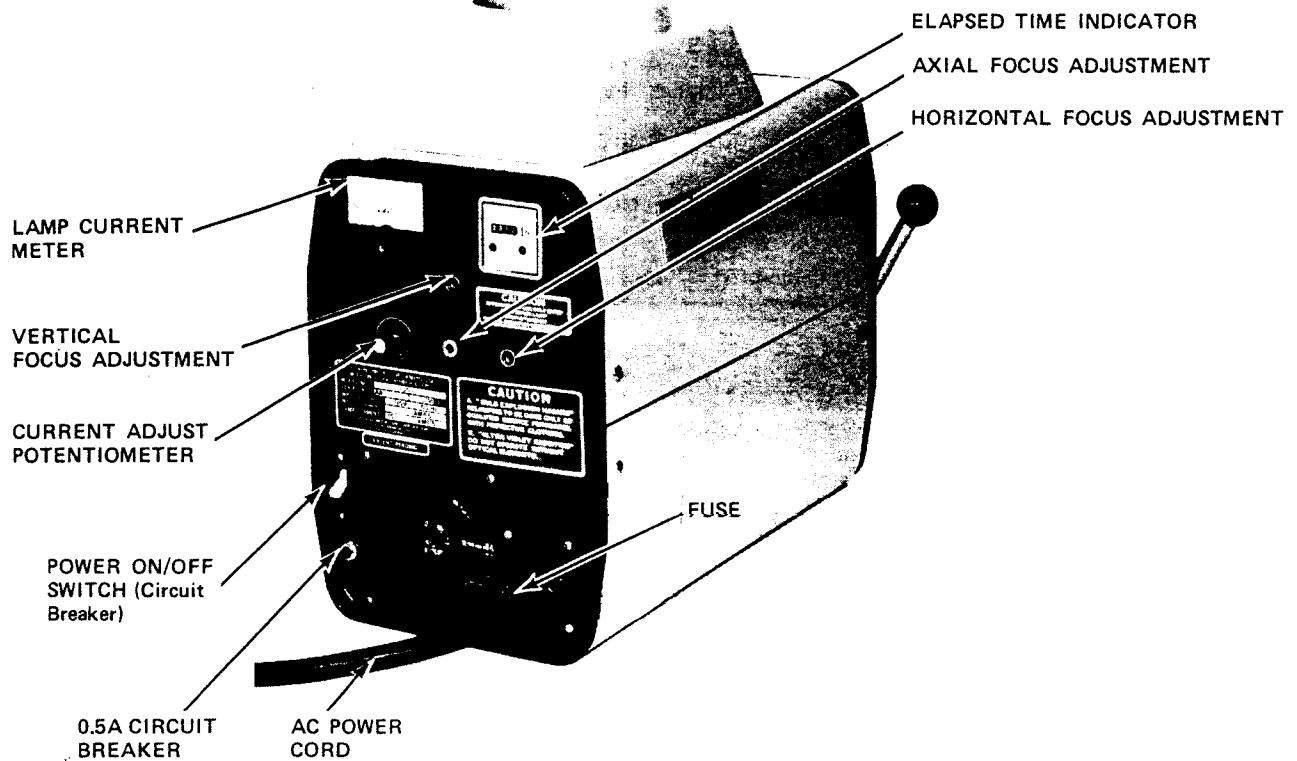
## 1.9 LAMPHOUSE CONTROLS AND INTERLOCKS

The lamphouse controls are located on the rear panel (see Figure 1-1) for easy access.

Two circuit breakers on the rear panel provide circuit over-load protection. A 0.5 amp breaker protects the igniter circuit and a toggle type 20 amp breaker protects the blowers and power supply. The breakers must be manually reset if an overload occurs. A 1/4 amp fuse is also provided to protect the control circuit in case of an overload. A thermal switch, set at 160°F (70°C) is mounted on the SCR heat sink to protect



Front View



Rear View

Figure 1-1. Model 1000 Xenon Lamphouse/Power Supply

the SCR's from operating beyond the recommended temperature range. If an excessive temperature rise occurs, the bulb will extinguish and automatically re-ignite when a safe operating temperature is reached. Interlock switches are provided to extinguish the bulb if the top access cover or snout is not properly in place.

The system is equipped with a DC ammeter for accurate lamp current adjustment. An elapsed time indicator is provided so that the number of operational hours on the lamp can be monitored, and the lamp warranty data can be accurately maintained.

#### 1.10 POWER SUPPLY

The power supply consists of three main subassemblies: the transformer/rectifier, the SCR board, and the control board. Plug in circuit boards are used and are accessible for service when the top cover is removed. The transformer/rectifier assembly is located in the lower portion of the lamphouse. The system is modular in design and internal connections are provided so that the unit can be disassembled for maintenance.

#### 1.11 SYSTEM ACCESSORIES

##### 1.11.1 Focus Tool

A 3/16" hex wrench with a plastic handle is used to rotate the three xenon bulb adjustment shafts which position the bulb in the mirror. It is also useful to remove the indexing shoulder bolt on the rear of the mounting plate which allows the lamphouse to swivel for servicing.

#### 1.11.2 Xenon Bulb Installation/Removal Tool (P/N 1145648)

The protective bulb installation/removal tool is a cylindrical transparent plastic device which fits over the bulb. It is constructed to provide a means of installing and removing the xenon bulb without physically handling the quartz surface while providing a protective cover over the bulb to minimize the danger of explosion during installation. The tool is comprised of a tube, two end caps, a retaining clamp, an anode collar and a cathode wing nut retainer.

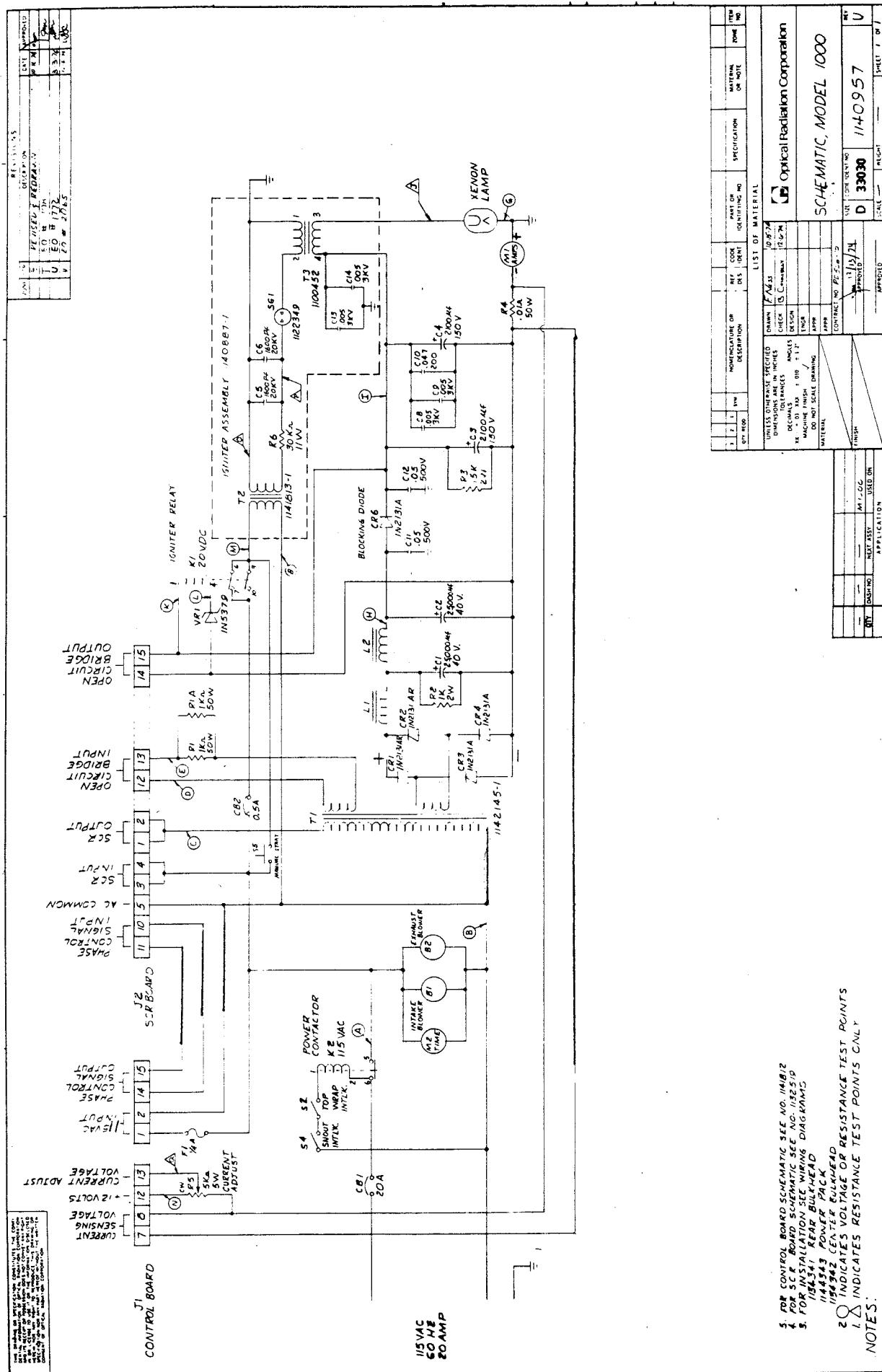
#### 1.11.3 Hex Wrenches

A 1/8" hex wrench is provided to remove and replace the retaining collar which holds the installation/removal tool captive around the bulb. The collar should be secured in place whenever handling the bulb. A 9/64" hex wrench is provided to secure the anode bulb connection in the lamphouse.

#### 1.11.4 Front Snout Optics

A negative lens is installed in all lamphouses ordered for 35mm projection systems (1000-35). The negative lens adjusts the light output beam for proper alignment to standard 35mm motion picture projectors.

A dichroic filter glass is installed in all lamphouses ordered for 16mm projection systems (1000-16). The dichroic coating reflects infrared light away from the film aperture. The infrared light, if not filtered, could heat damage the film when the output light beam is focused down on 16mm or smaller apertures.



**REVISIONS**

ITEM NO.	DESCRIPTION	DATE APPROVED
A	2112 WIRE, DDX-EQ, 00181	1/17/69
B	2112 WIRE, DDX-EQ, 00182	1/17/69
C	2112 WIRE, DDX-EQ, 00183	1/17/69
D	2112 WIRE, DDX-EQ, 00184	1/17/69

**COMPONENTS (NEW)**

DESIGNATION	REFERENCE	DESCRIPTION	ITEM NO.
DES	R101	RESISTOR	100K
DES	R102	RESISTOR	100K
DES	R103	RESISTOR	100K
DES	R104	RESISTOR	100K
DES	R105	RESISTOR	100K
DES	R106	RESISTOR	100K
DES	R107	RESISTOR	100K
DES	R108	RESISTOR	100K
DES	C101	CAPACITOR	10PF
DES	C102	CAPACITOR	10PF
DES	C103	CAPACITOR	10PF
DES	C104	CAPACITOR	10PF
DES	C105	CAPACITOR	10PF
DES	C106	CAPACITOR	10PF
DES	C107	CAPACITOR	10PF
DES	C108	CAPACITOR	10PF
DES	Q101	TRANSISTOR	MPN: 2N3906
DES	Q102	TRANSISTOR	MPN: 2N3906
DES	Q103	TRANSISTOR	MPN: 2N3906
DES	Q104	TRANSISTOR	MPN: 2N3906
DES	Q105	TRANSISTOR	MPN: 2N3906
DES	Q106	TRANSISTOR	MPN: 2N3906
DES	Q107	TRANSISTOR	MPN: 2N3906
DES	E101	DIODE	MPN: 1N4007
DES	E102	DIODE	MPN: 1N4007
DES	E103	DIODE	MPN: 1N4007
DES	E104	DIODE	MPN: 1N4007
DES	E105	DIODE	MPN: 1N4007
DES	E106	DIODE	MPN: 1N4007
DES	E107	DIODE	MPN: 1N4007
DES	E108	DIODE	MPN: 1N4007

**NOTES:**

2. FOR MODEL 1000 SCHEMATIC, SEE NO. 114087.  
1. ALL RESISTORS 1% 1/2W, R101-R108  
UNLESS OTHERWISE NOTED.

**SCHEMATIC**

**CONTROl BOARD**

**LIST OF MATERIAL**

ITEM NO.	DESCRIPTION	REF. NO.	COOK	DATE	IDENTIFYING NO.	PART NO.	SPECIFICATION	MATERIAL	NOTE	ITEM NO.
D 33030	SCHEMATIC	114087	1/17/69	1/17/69	1/17/69	1/17/69	1/17/69	1/17/69	1/17/69	D

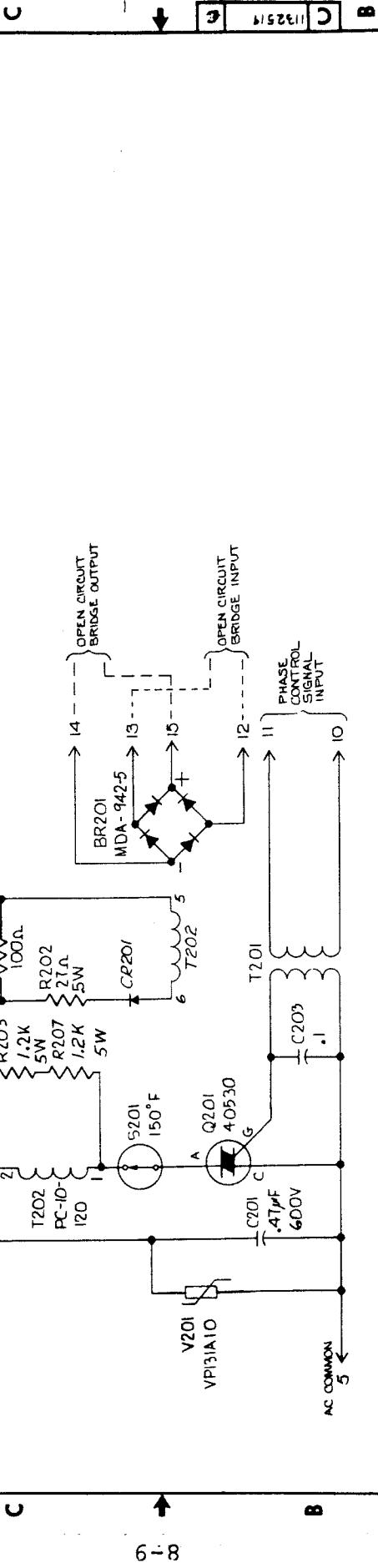
**APPENDIX**

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
DRAWINGS ARE IN INCHES  
X = 1/16 INCHES  
1/16 INCHES = 1.6MM  
1/32 INCHES = 4MM  
1/64 INCHES = 1MM  
1/128 INCHES = 0.5MM  
1/256 INCHES = 0.25MM  
1/512 INCHES = 0.125MM  
1/1024 INCHES = 0.0625MM  
1/2048 INCHES = 0.03125MM  
1/4096 INCHES = 0.015625MM  
1/8192 INCHES = 0.0078125MM  
1/16384 INCHES = 0.00390625MM  
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The circuit diagram illustrates a power supply configuration. It starts with an AC INPUT terminal (3, 4) connected to a bridge rectifier stage. The positive output from the rectifier is connected to the阴极 (C) of a vacuum tube V201 (VP131A10). The filament of V201 is connected to ground through a resistor R202 (PC-10-120 ohms). The cathode (K) of V201 is connected to the阴极 (C) of a vacuum tube T202 (T202). The filament of T202 is connected to ground through a resistor R203 (1.2K ohms, 5W). The anode (A) of T202 is connected to the 阳极 (G) of a vacuum tube R204 (82 ohms, 1W). The filament of R204 is connected to ground through a resistor R205 (27 ohms, .5W). The 阳极 (G) of R204 is connected to the 阳极 (G) of an SCR (SCR202, 2N3873). The阴极 (C) of SCR202 is connected to ground through a capacitor C202 (.47 μF, 600V). The 阳极 (G) of SCR202 is connected to the 阳极 (G) of another vacuum tube T201 (T202). The filament of T201 is connected to ground through a resistor R207 (1.2K ohms, 5W). The 阳极 (A) of T201 is connected to the 阳极 (G) of a vacuum tube Q201 (4C530). The filament of Q201 is connected to ground through a resistor R206 (100 ohms). The 阳极 (G) of Q201 is connected to the 阳极 (G) of a vacuum tube S201 (150°F). The filament of S201 is connected to ground through a resistor R208 (100 ohms). The 阳极 (A) of S201 is connected to the AC COMMON terminal (5).

REVISIONS		APPROVED		
ZONE	LTR	DESCRIPTION	DATE	
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C	S.E.L. E.O. #02010		8-19-73	o/c
			9-22-76	W.H.C.



		NOMENCLATURE OR DESCRIPTION		REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION	MATERIAL OR NOTE	ZONE	ITEM NO.
3	2	1	SYN.							
LIST OF MATERIAL										
<p>UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES DECIMALS <math>XX = \pm .03</math> <math>XXX = \pm .010</math> <math>\pm 1/2^*</math> MACHINE FINISH DO NOT SCALE DRAWING</p> <p>MATERIAL: FINISH:</p> <p>DRAWN BY: DR-SCARBO</p> <p>CHECKED BY: DR-SCARBO</p> <p>DESIGNED BY: DR-SCARBO</p> <p>ENGR'D BY: DR-SCARBO</p> <p>APPR'D BY: DR-SCARBO</p> <p>CONTRACT NO: PD-506-10</p> <p>DATE: 1-11-72</p> <p>APPROVED: DR-SCARBO</p> <p>SIZE: CODE IDENT NO. C 33030</p> <p>REV: C</p> <p>OPTICAL RADIATION CORPORATION 1000 E. PEAK RD., KNOXVILLE, TENN. 37940-0110</p> <p>SCHEMATIC, SCR BOARD</p>										

1. FOR MODEL 1000 SCHEMATIC SEE NO. 1140957.  
NOTES:

1. FOR  
NOTE S:

SCHEMATIC, SCR BOARD

FINISH:	APPROVED	1-11-72	C 33030	1132519	G
CODE IDENT NO.	SIZE				REV

-1 1142518 PD 506-10  
DASH NO. NEXT ASSY USED ON

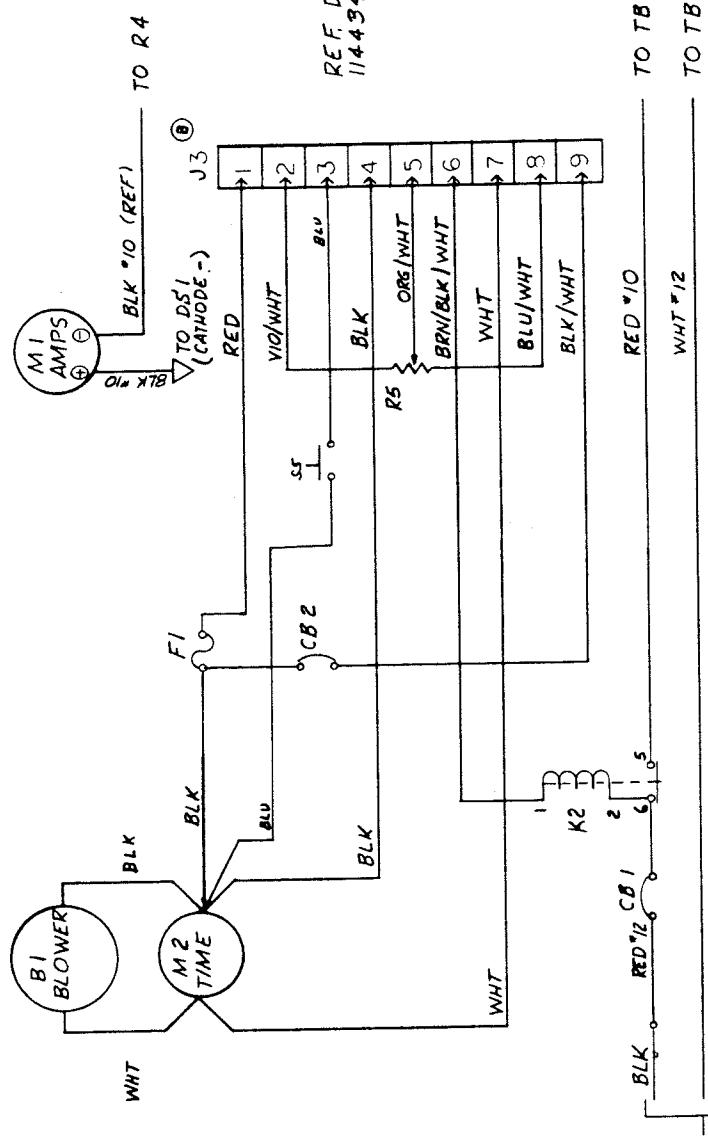
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REVISIONS

ZONE	ltr	DESCRIPTION	DATE	APPROVED
A	E0 # 1466		1-9-75	JAN
B	EOR 652.		1-7-76	
C	E0 # 2067 ADDED 5.5		11-4-76	WJS



REF DRAWING  
144343

RED #10 TO R4  
WHT #12 TO TB1-3  
POWER INPUT

RED #10 TO TB1-1  
WHT #12 TO TB1-1

ITEM NO.	DESCRIPTION	REF DES	CODE IDENT	PART OR IDENTIFYING NO.	SPECIFICATION NO.	MATERIAL OR NOTE	LIST OF MATERIAL	
							QTY	MEAS
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES								
DRAWN	J KROLIK	2-22-74						
CHECK	B CONNELLY	6-26-74						
ANGLES								
DECIMALS								
XX = ± .010	XXX = ± .010	± 1/2"						
DO NOT SCALE DRAWING								
MATERIAL:								
CONTRACT NO. PD-506-10								
APPROVED								
FINISH:								

**P** Optical Radiation Corporation

**A** WIRING DIAGRAM

**A** REAR BULKHEAD

4. EFFECTIVITY: M1000 S/N AA00786 & UP OPTIONAL CIRCUITS NOT SHOWN.  
 3. REF SCHEMATIC 1440957.  
 2. ALL WIRES #20 AWG UNLESS OTHERWISE SPECIFIED.  
 A. FEMALE MOLEX CONNECTORS  
   ARE DESIGNATED "J"  
   MALE MOLEX CONNECTORS  
   ARE DESIGNATED "P".  
 NOTES:  
 1. DASH NO. NEXT ASSY USED ON APPLICATION

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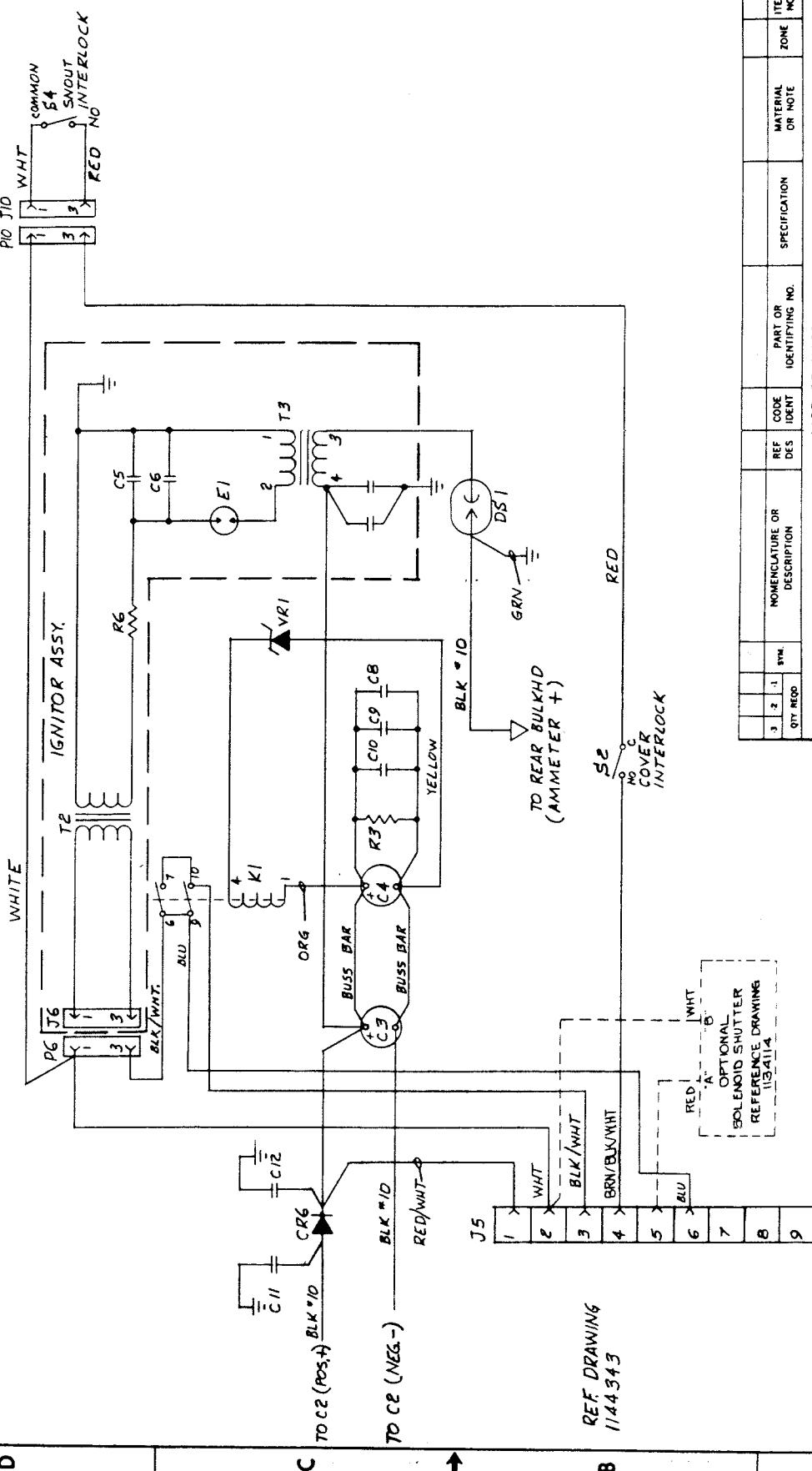
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4. EFFECTIVITY: M1000 S/N AAC00786 & UP. OPTIONAL CIRCUITS NOT SHOWN.  
 5. REF. SCHEMATIC 1140957.  
 2. ALL WIRES #20 AWG UNLESS OTHERWISE SPECIFIED.  
 1. FEMALE MOLEX CONNECTORS  
     ARE DESIGNATED "J".  
 MALE MOLEX CONNECTORS  
     ARE DESIGNATED "P".  
 NOTES:  
 QTY DASH NO. -1 -1 PD506-10  
 DASH NO. NEXT ASSY USED ON

Optical Radiation Corporation

## WIRING DIAGRAM CENTER BUJ KHEA

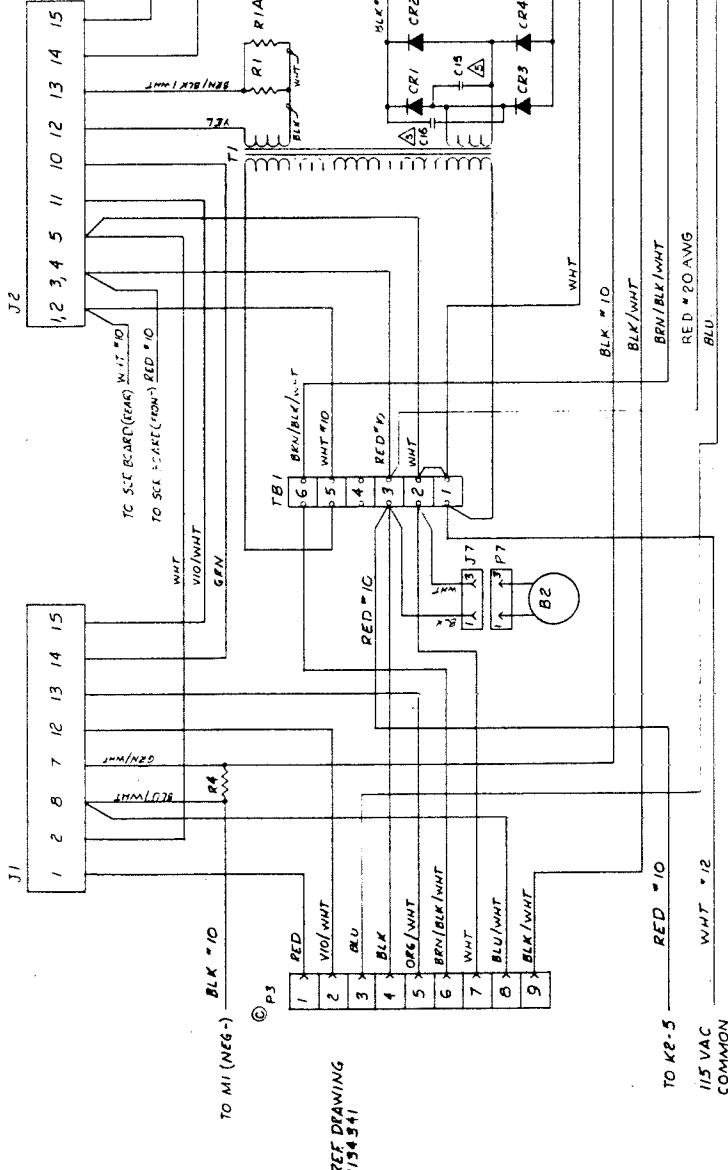
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SHEET 1 OF 1

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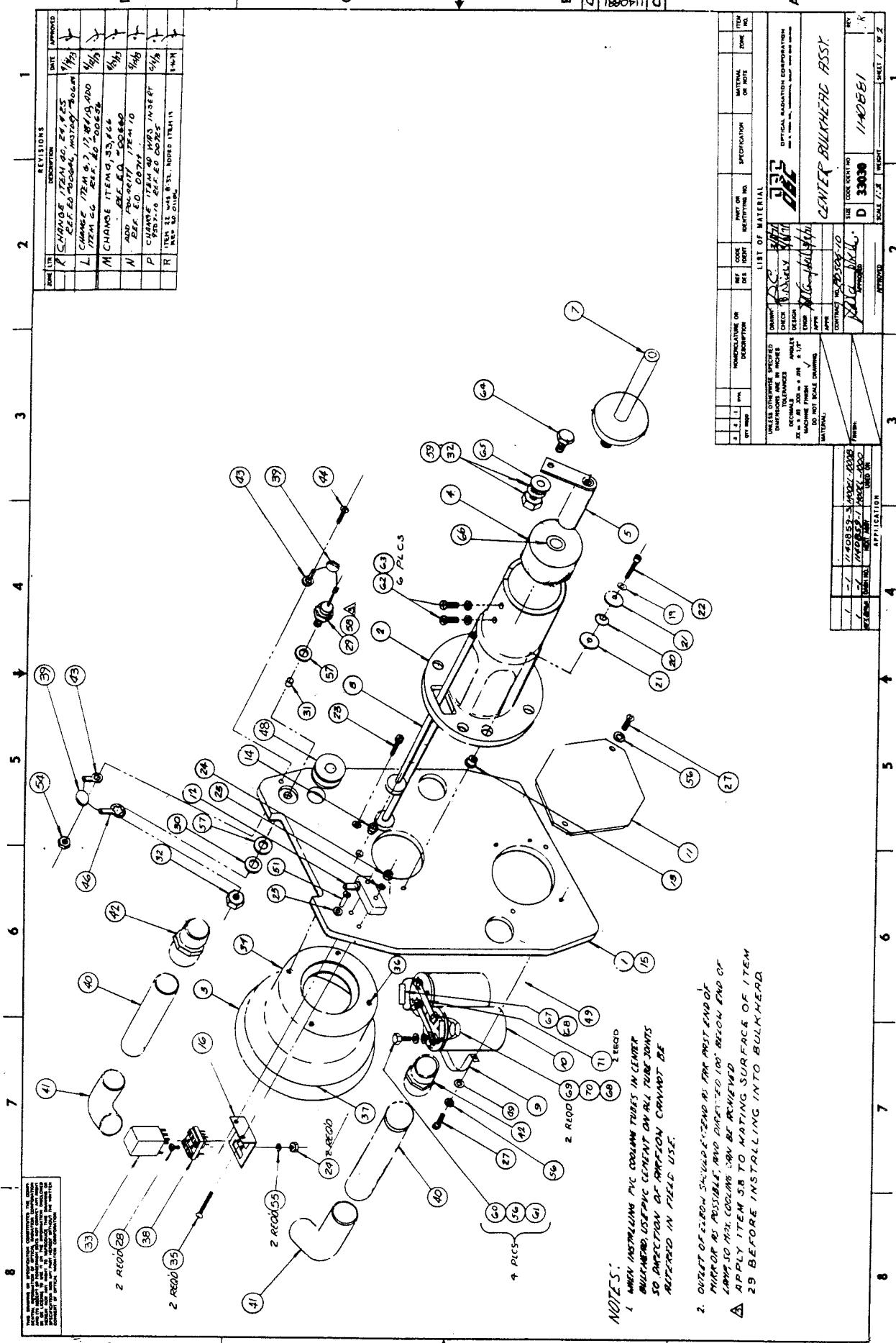
**NOTES**

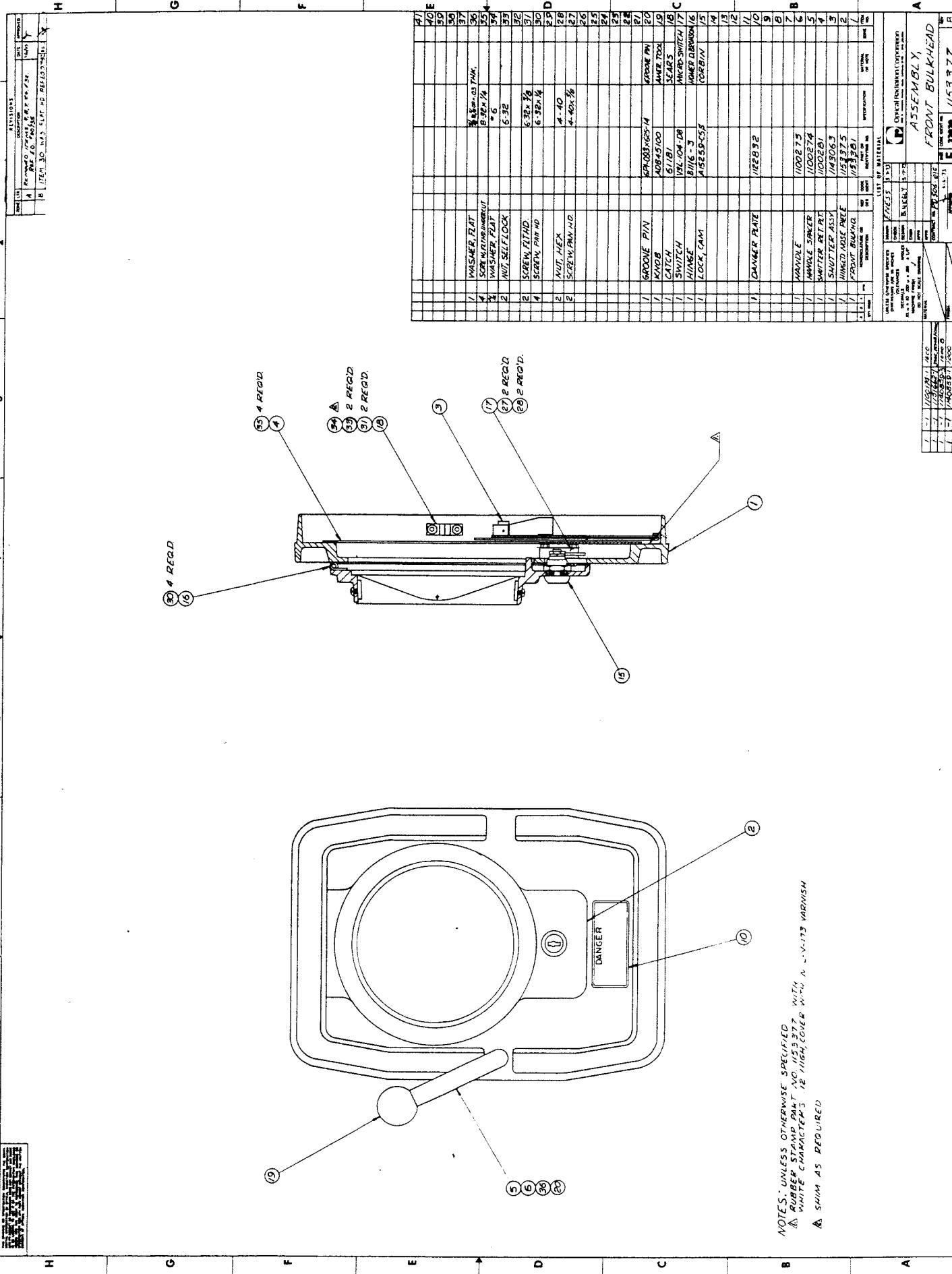
▲ M10008 ONLY C15 C16 (.47-.5 uF 200-600V)  
 ▲ EFFECTIVITY: M1000 S/N AAO0786 & UP CIRCUITAL CIRCUITS NOT SHOWN  
 3 REF SCHEMATIC 1140957 (M1000)-1142018 (N1000B)  
 2. ALL WIRES • 20 AWG UNLESS OTHERWISE SPECIFIED.  
 1. FEMALE MOLEX CONNECTORS  
 ARE DESIGNATED "J"  
 MALE MOLEX CONNECTOR  
 ARE DESIGNATED "P".

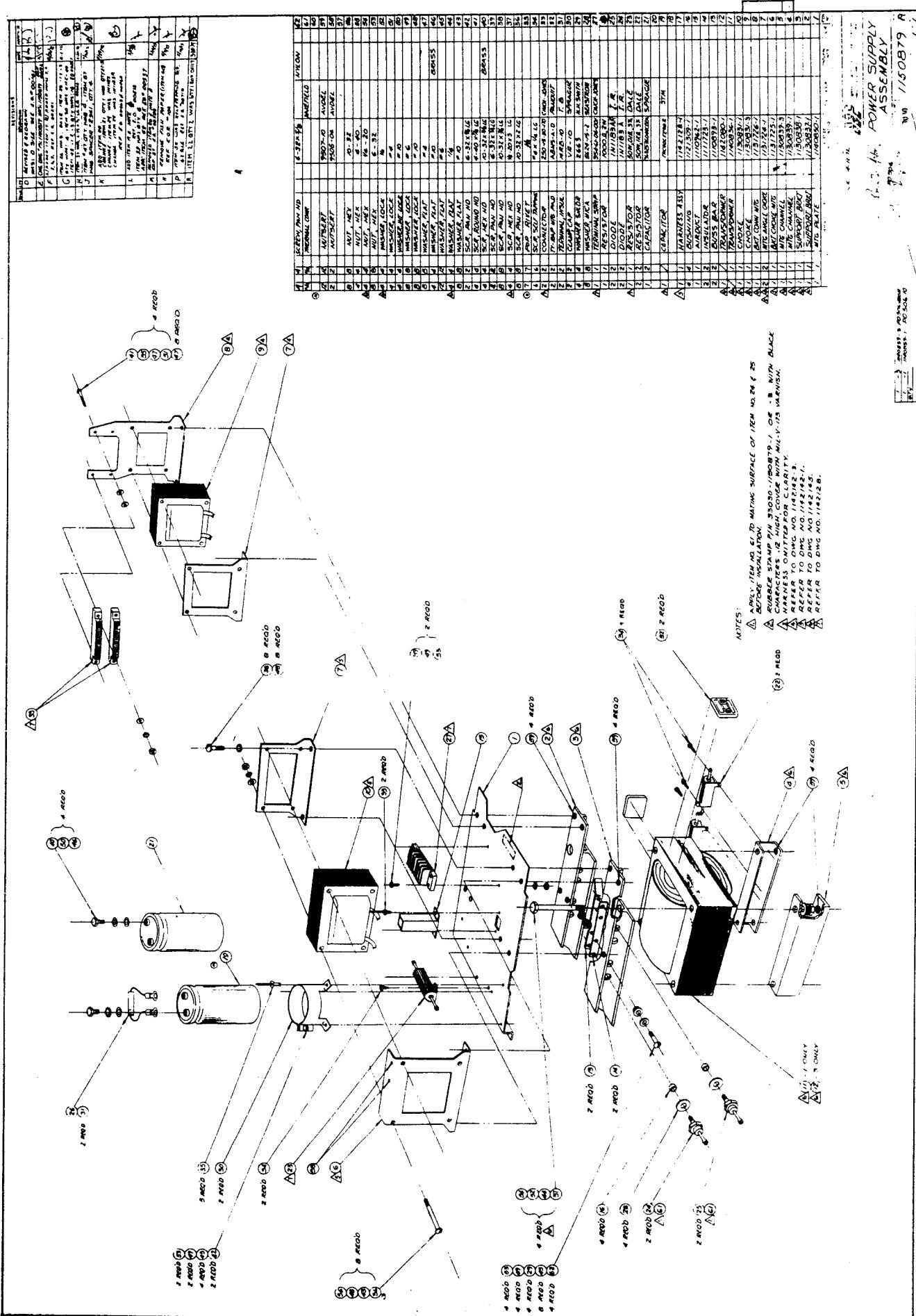
ITEM NO.	DESCRIPTION	DRAWN BY	REVISIONS	PART OR IDENTIFYING NO.		SPECIFICATION	MANUFACTURER OR MOTE.	WORK TIME
				REF. CNT.	CHT.			
1	2	3	4	5	6	7	8	9
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMALS ARE IN FEET ANGLES EX. 1-1/2" X 1-1/2" X 1-1/2" 1-1/2" X 1-1/2" X 1-1/2" X 1-1/2"								
CHECK IS COMPLETED BY CONTRACT NO. 11-31-C DATE 6/27/64 MATERIALS NOT TO SCALE DRAWINGS MADE FOR APPROVAL ONLY								
WIRING DIAGRAM POWER PACK								
OPTICAL REPLICATION CORPORATION								
D 33030 1144.343 D								
APPROVED _____ FIRMAN								
SCALE _____ INCHES								
SHEET 1 OF 1								

REVISIONS		DESCRIPTION		DATE APPROVED	
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19	-3 ONLY				
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21	2 REQ'D.				
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23	22				
24	-3 ONLY				
25	-1 ONLY				
26	2 REQ'D.				
27	2 REQ'D.				
28	2 REQ'D.				
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