Film-Tech

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XETRON
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CEDAR KNOLLS, N. J. 07927
201 - 267-8200

IREM Power Supplies

N1 and N3 Types

Date: 12/1/70

These power supplies are available to cover a wide range of power applications and are normally used to supply filtered direct current to short arc Xenon bulbs in motion picture equipment. The single phase units, having lower capacity, can be used with 115 or 230 volts input (except M1-X75) but in all cases the higher voltage is recommended as the line-current is only one half as much as it would be with 115 volts input.

All units are designed to deliver the nameplate power on a continuous basis and with a nominal variation in line voltage. The three phase units will deliver normal power with line voltages from 208 to 230 volts.

Output power is regulated by changing the magnetic flux coupling the primary and secondary transformer windings. This shunt is connected to a hand wheel and moved up and down to provide a continuously variable change in output.

The terminal panel, shown on Drawing #7000-A, serves to terminate the input and output leads and ON/OFF switching facilities. Recommended wire sizes for AC input and DC output circuits are shown. The ground wire on the left hand terminal should be the same size as the AC input leads and color as per local code. The leads connected to the terminals marked 220 volts (300 watts maximum) should be #14. They supply the lamphouse with 220 volts to operate the starter and hour meter only when the rectifier is turned on. Local control of the power supply is by the toggle switch on the unit connected as shown. If desired this switch loop can be extended to the projector base for more convenient control. When automation is being used, the two button ON/OFF switch should be used and connected as shown. Additional on circuits can be connected in parallel with the on switch. Additional off and failsafe switches can be connected in series with the off switch.

All IREM power supplies are supplied with magnetic switches for ON/OFF control. See Power Supply Schematics for circuit details and note that an extra set of contacts are provided for latching the switch in the on position and releasing when toggle switch RC is opened or the off switch depressed. Also in reference to this drawing, it will be observed that each primary consists of two coils in series and the three pair in a star connection. On the secondary side we have two primaries in parallel and each coil having a center top. These coils are also star connected and this permits the use of 6 identical diodes mounted on a common heat sink to be used. Each diode is shunted by a .22 mfd capacitor to bypass any switching transients that could damage the diode.

The power supplies use high reactance transformers to provide a suitable volt-ampere output characteristic. The no load voltage must be 80 - 120 volts when first energized and drop to approximately 25 volts, depending upon the size of the bulb, when the bulb ignites and starts to draw current. All Xenon power supplies have a large output capacitor whose discharge is very helpful in starting the initial current flow thru the bulb.

The RA unit serves the special purpose of inserting a low value resistance in series with this capacitor so its charging and discharging peak currents will be reduced. After the bulb is ignited, the relay shorts out this resistor and permits the capacitor to do its normal filtering function. The bulb manufacturer recommends that the output current pulsation not exceed 10 percent peak to peak. The IREM units normally check less than this value.

It is very important that tight, clean connections be maintained and that the units be properly protected with fuses or circuit breakers. The technical data sheet provides the necessary information as to current drawn by each unit.

Normal service calls for removal of the panels once a year to brush off the collected dust and checking to see that the input and output connections are tight. These units depend upon convection currents for cooling and must not be located in confining quarters or in rooms having high ambient temperatures. The transformers are designed to operate at temperatures not to exceed room temperature plus 65 degrees centigrade.

As the magnetic shunts operate in a very strong magnetic field they can be the source of a loud hum if not properly centered. In this case they vibrate against the transformer laminations causing the noise.

Brass centering screws in fiber blocks are provided to readjust the position of these shunts when necessary. Please refer to drawing #7010-A for instructions. The original units have two brass screws in each position. The later models, with red dots on the nameplates, have a third screw in the center which serves to lock the two outside screws when it is tightened.

If trouble is experienced lighting the bulb despite the fact that the spark gap in the lamphouse is delivering a good normal spark, the RA unit in the power supply may be suspected. If the one ohm resistor should be open or the capacitor out of the circuit due to some malfunction of the RA relay, a temporary connection can be made by pulling away the four circuit nylon plug from the relay assembly and using two pieces of solid #14 wire to make jumpers, one connecting the two inside connections (black wires) together and the second to connect the two outside (red wires) connections together. This will enable the capacitor to be connected directly across the output of the power supply and ignite the bulb with a higher than normal peak starting current but would be satisfactory until a new RA unit can be installed. If this does not correct the condition, the capacitor should be checked.

At any sign of trouble it is always advisable to check the no load voltage of the unit to see if the normal 80 volts is being obtained on the 900, 1600 watt units, 95 for the 2500 watt, 110 for 4000 watt and 120 for 6500 watt. Under normal conditions, the bulb will ignite almost instantaneously with an ignition time of one second or less. If the bulb fails to ignite, under no circumstances should the start button be pressed for more than one or two seconds - nor in rapid succession. This can damage the starter components as they are designed for momentary duty only.

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XeTRON POWER SUPPLIES & LAMPHOUSES

Trouble Shooting Information

Date: 12/1/70

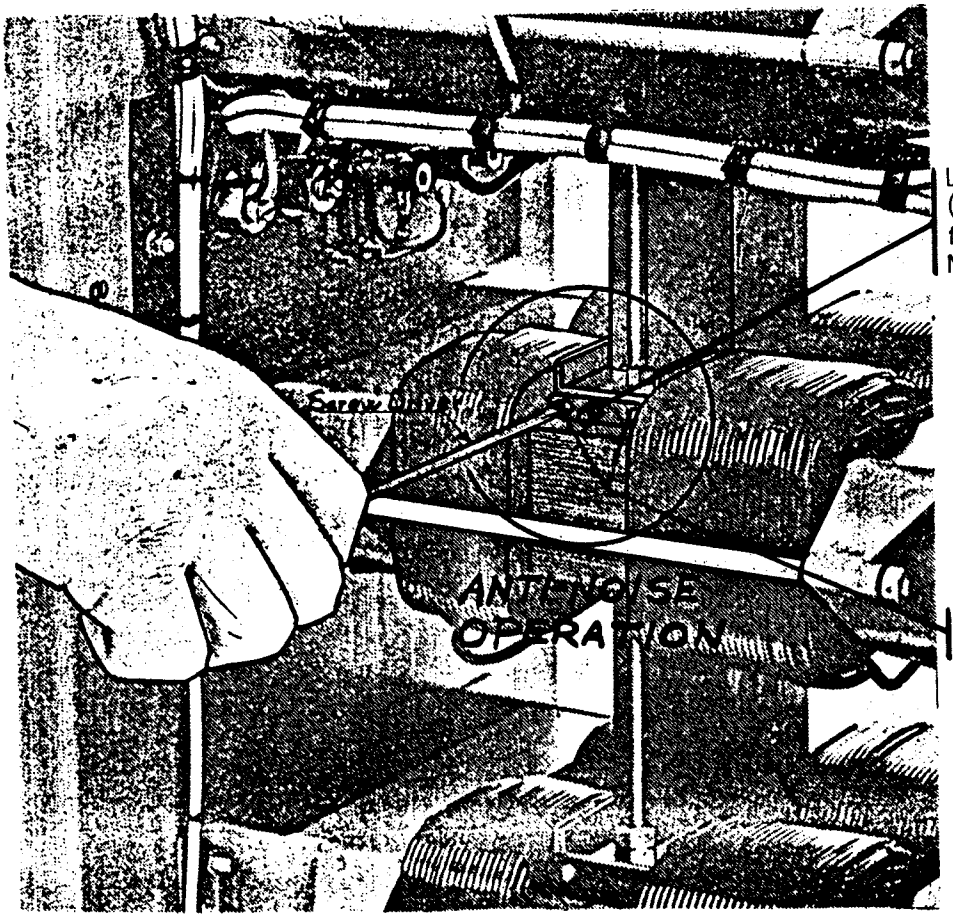
1. Will not turn on - magnetic contactor will not close.	1. Check AC fuses - foreign particles or rust in magnetic contactor. Defective coil in magnetic contactor. Check toggle switch. Check TP in series with coil (1 phase units only). Operate contacts manually. In case automation is used, check external circuits which will be bypassed if toggle switch is ON.
2. Adjusting wheel turns very easily-power supply makes noise under load.	2. Adjust brass screws in each transformer bank - refer to special page in power supply manual. The noise is mechanical and does not indicate any electrical malfunction.
3. Adjusting wheel turns very hard.	3. Shunt tight due to adjusting screws - do not force wheel - loosen brass screws in each transformer bank - then check for excessive hum with power supply under load.
4. Difficult to strike Xenon bulb or erratic start.	4. Check for burned or pitted contacts in relay on RA control board in power supply. Remove plastic plug from RA unit - using #14 jumper wires - jump black to black and red to red to bypass RA. See if bulb will strike with no hesitation - if so, replace RA unit. Power supply can be operated with the jumper wires, but new RA unit should be installed as soon as possible. Check Xenon bulb for excessive erosion of tip as this widens the gap and makes starting more difficult. Failure to obtain 85-90 volts no load may indicate defective filter capacitor. Check internal wiring of lamphouse to see if spark is going to ground rather than through bulb. Remove one DC cable while making this check. Check .1 mfd (600 or 1000 V) capacitor (one of 4 on starter) in circuit between the negative DC lead and ground. Temporarily strap a .22 1000 V (preferably oil) anywhere across the negative DC to ground and try the ignition.

5. No 220 VAC for ignition from terminals marked 220 VAC single phase units only. Three phase units take 220 VAC for ignition directly from the load side of the magnetic contactor.	5. Auxiliary transformer winding in power supply open due to excessive load- replace transformer section or obtain temporary operation by using separate AC supply to lamphouse.
6. Magnetic contactor chatters- will not hold in.	6. One phase of 3 phase power open or 3 ø power low. Minimum should be 208. Check latching contacts.
7. Flicker on screen- machine running.	7. Most common cause is too much light. * Reduce power or turn main reflector focus control clockwise (moving reflector toward bulb) this will decrease center screen light and improve light distribution. Check for bad bulb See additional items under Section 8. * Should not exceed 16 ± 2 FL.
8. Flicker on screen-machine not running - white light only.	8. Bad Xenon bulb. Arc can be very unstable if tungsten deposit appears on bottom of anode. Bad diode - Check with AC probe (6A scale) should not exceed approximately 2.5 amps. Open filter capacitor or defective RA unit. Check diodes with ohmmeter after disconnecting one lead. Capacitor or capacitors (large can type unit) could be defective. One phase of AC open or defective 3 ø disconnect switch. Check voltage on each phase at power supply input. Capacitors can be tested by turning on power supply, no ignition, turn off and place short or VM across output. Should have violent spark or voltmeter should show 80-90 volts with gradual drop off to zero.
9. Sparks from power supply when turned on - AC fuse blown.	9. Wires on back of AC 3 ø input terminals shorted due to lugs on back of panel turning. Lock washers and square studs will be used in the future.

XeTRON A DIVISION OF CARBONS, INC. CEDAR KNOLLS, N. J. 07927	IREM POWER SUPPLIES NOISE REDUCTION	#7010-A 2/1/70

Abnormal hum or vibration which may develop in a power supply can usually be eliminated by tightening the brass screws located in the composition blocks on <u>both</u> <u>sides</u> of the movable shunt or center section of the power supply. These brass screws are readily accessible after removing the blue panels and there are 10 or 12 brass screws on each side. We recommend the first effort to reduce the noise be made by turning each screw associated with the center transformer one half turn (all adjustments made while power supply is on and under load). If no noise reduction is noted, return it to the "as found" position and try the others, first on one side and then the other. If the noise has not been reduced to a satisfactory level, we recommend the following:

1. Loosen all the brass screws on one side of the shunt(locking screw first
2. Tighten all brass screws (CAUTION-do not force or overtighten these screws) on opposite side of shunt and then back off these screws 1/4 turn each. Tighten locking screw.
3. Tighten screws on original side (Step I) until a normal operation is obtained. You may also find it to your advantage to slightly retouch the adjustments on the opposite side (Step 2). Tighten locking screw.



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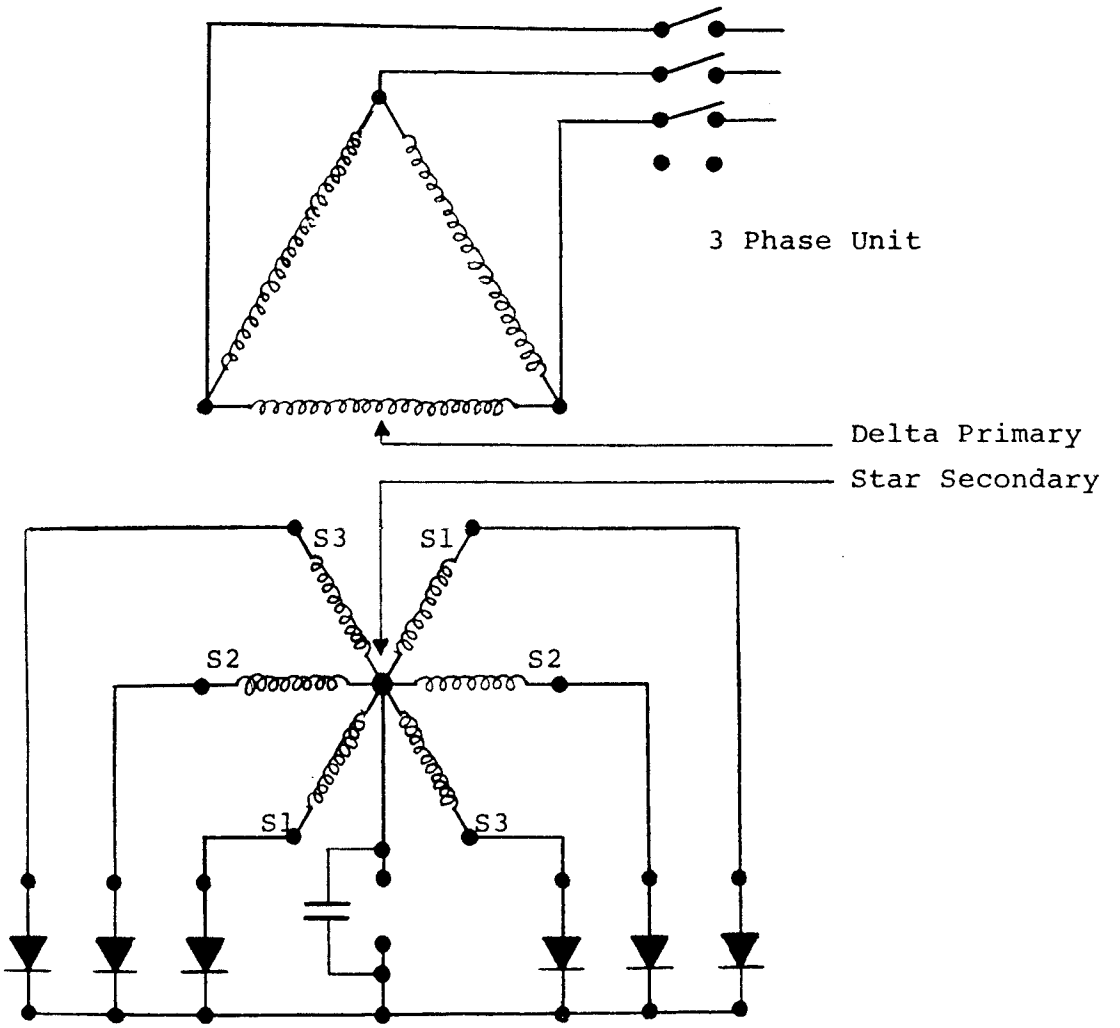
XeTRON POWER SUPPLIES & LAMPHOUSES

Trouble Shooting Information

Date: 12/1/70



1. To check 3 ø secondary for balance, use AC voltmeter from negative DC terminal to lead from each diode. The voltage should be the same at each diode.

2. DC voltage drop, with load, should be the same across each diode. Measured from the positive DC terminal to each diode.

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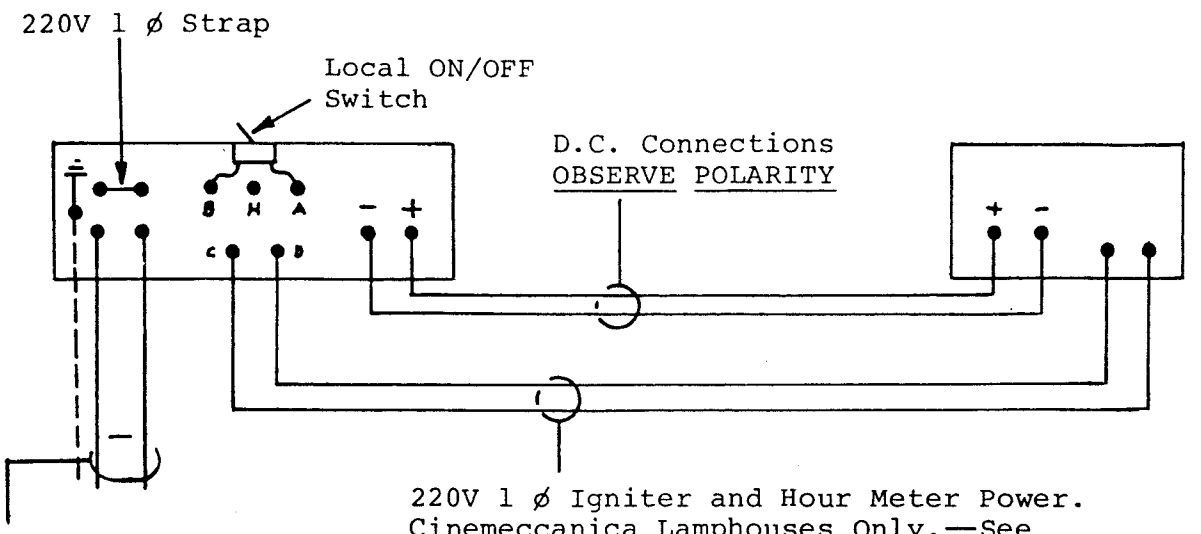
WIRING DIAGRAM

N1&N3 SERIES POWER SUPPLIES

Dwg. #7000-D

Date: 3/20/72

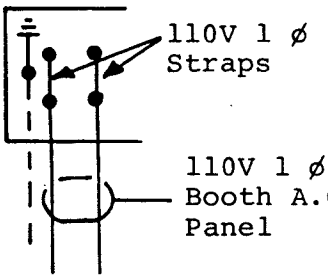
N1 Type Power Supply (1 ø)



220V 1 ø From Booth A.C. Breaker Panel

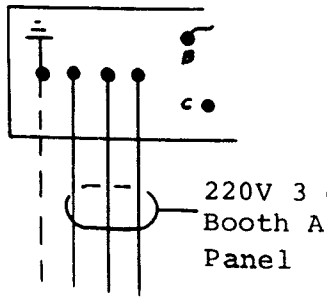
220V 1 ø Igniter and Hour Meter Power. Cinemeccanica Lamphouses Only.—See separate instructions in XH Lamphouse Manual for XH-1000, XH-2000, XH-3000. (Also Powers Exhaust Fan On CX-1600 and Blowers on CX-450 And CX-900) There is power on this pair only when the Power Supply is ON.

Lamp Igniter



NOTE: When An N1 Type Power Supply Is Powered With 110V 1 ø Terminals C and D Still Supply 220V 1 ø For The Igniter.

N3 Type Power Supply (3 ø)



WIRE CHART

Power Supply	A.C. Input	D.C.
N1-X30	110V #12 220V #14	# 8
N1-X50	110V # 8 220V #12	# 6
N3-X50	220V #14	# 6
N3-X75	220V #14	# 4
N3-X75/95	220V #12	# 2
N3-X95/140	220V #10	# 0
N3-X160	220V # 8	#00

220V 1 ø Ignition #16

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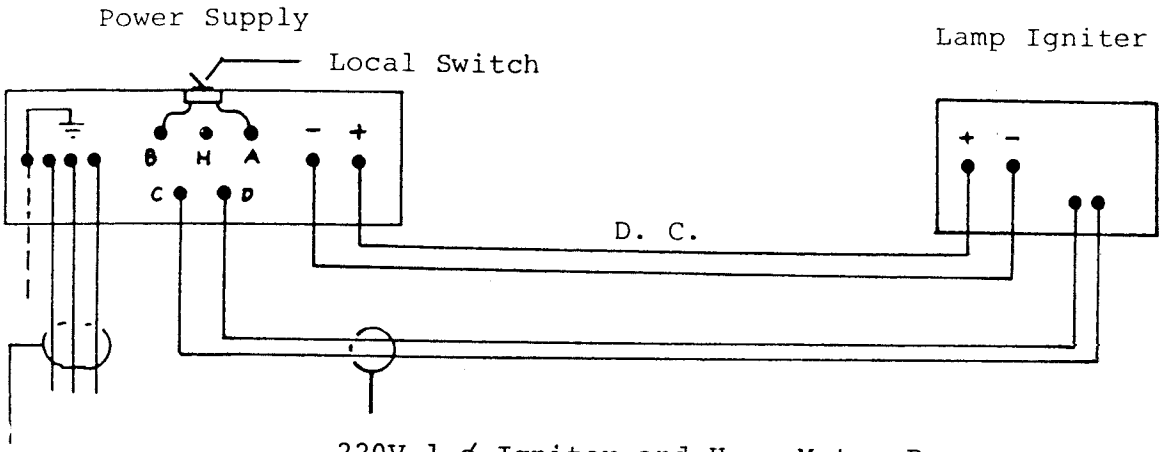
LAMPHOUSE AND POWER SUPPLY SAFETY INTERLOCK AND REMOTE CONTROL CONNECTIONS

Date: 3/15/72

All Xetron power supplies are equipped with a "local" ON/OFF switch for controlling the unit. In the simplest installations, the power supply is located directly behind the lamphouse and the "local" switch is used to control the power supply.

FIGURE 1

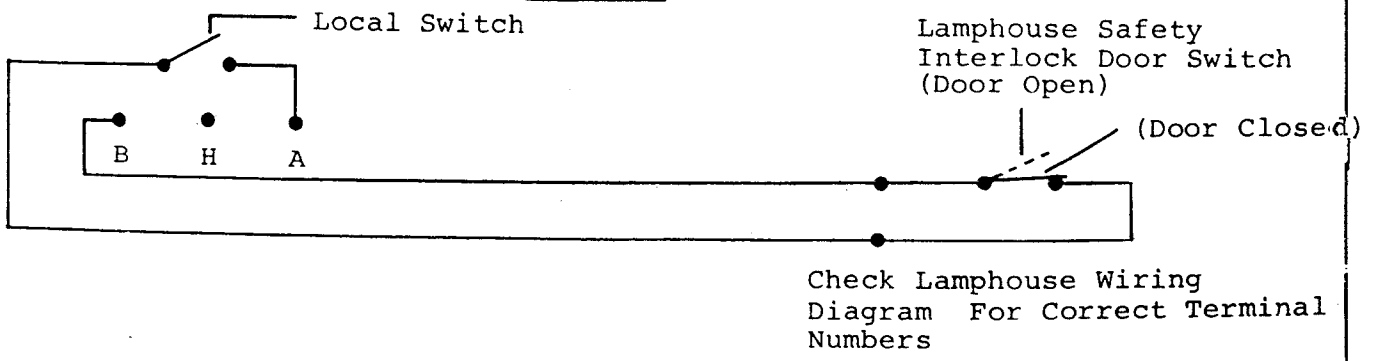


C. Power From Booth A.C. Breaker Panel. (See specific power supply schematic)

220V 1 ø Igniter and Hour Meter Power. Cinemeccanica Lamphouses Only.—See separate instructions in XH Lamphouse Manual for XH-1000, XH-2000, XH-3000. (Also Powers Exhaust Fan On CX-1600 and Blowers on CX-450 and CX-900). There is power on this pair Only when the power supply is ON. Check Lamphouse Wiring Diagram For Correct Terminal Numbers.

Although this type of installation is operational, it leaves out one important feature, the lamphouse door safety interlock switch. This switch must be connected in such a manner that it is impossible to ignite or operate the lamp if the door is open. Such a door operated safety switch is incorporated into all CX-1600 and 4000X lamphouses. The switch is a normally open spring loaded microswitch. The door, when closed, holds the switch closed. This safety switch must be wired in series with the power supply switch as shown in Figure 2.

FIGURE 2



In many installations it is not practical or desirable to locate the power supply adjacent to the lamphouse. In these cases remote control is necessary. All Xetron power supplies can be controlled remotely with either a single pole single throw switch or a normally closed "OFF", normally open "ON" two pushbutton, three wire control.

FIGURE 3

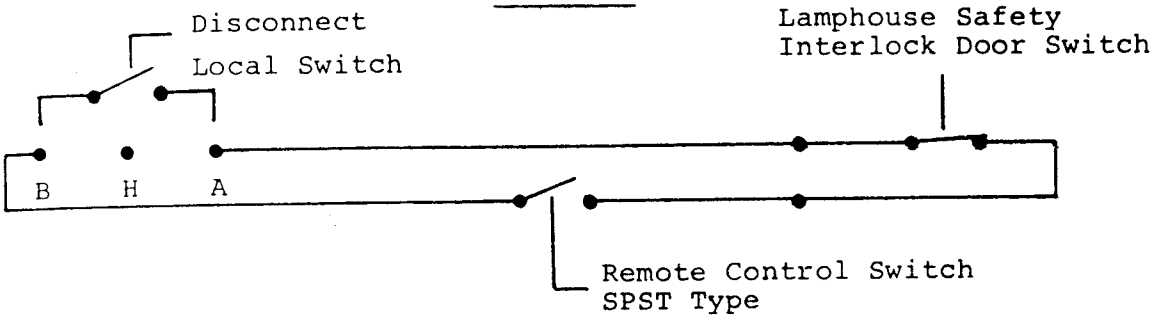
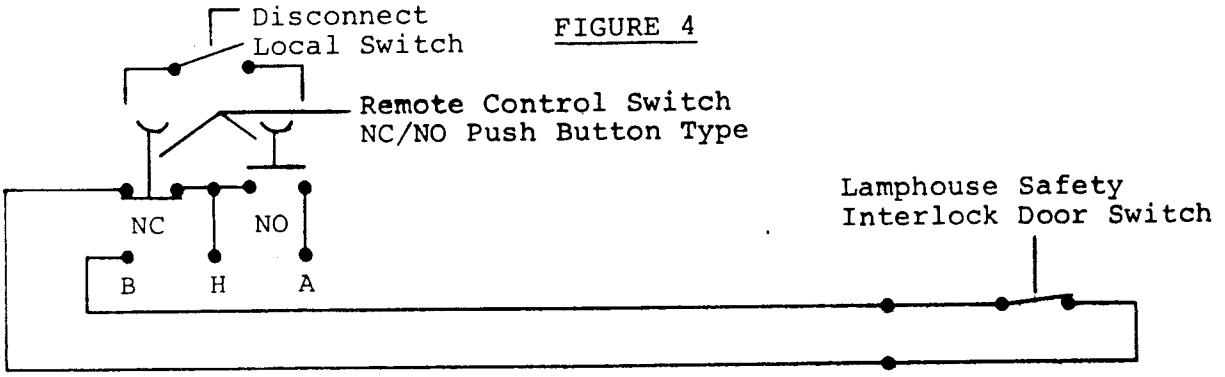


FIGURE 4

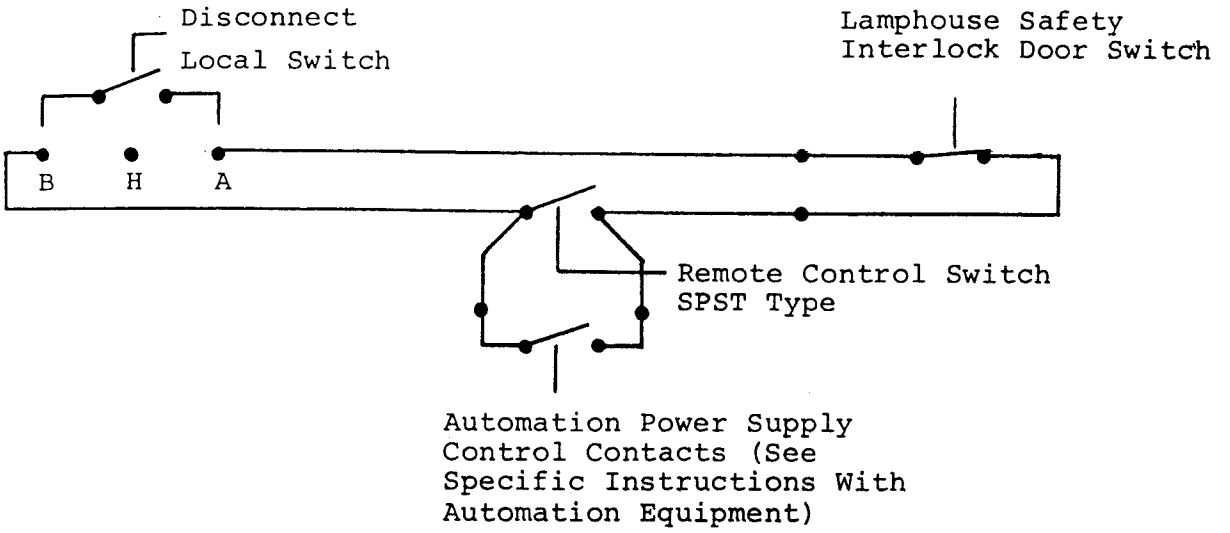


The romote control switch is normally installed on the projector base or beam.

Always connect the door safety switch in series with the "B" terminal on the power supply.

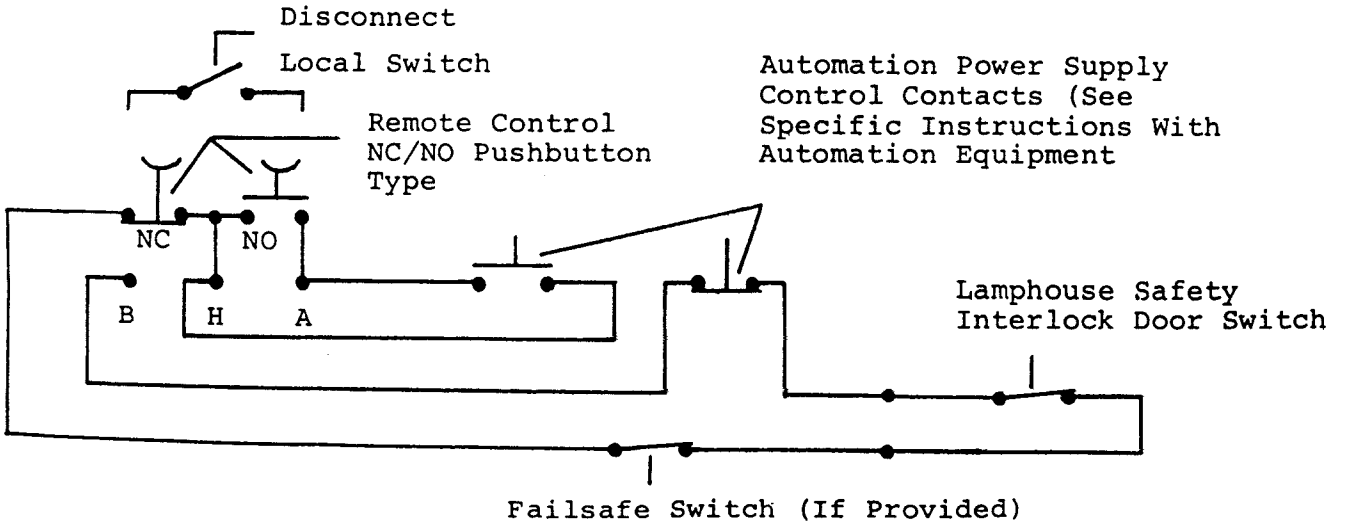
When automation is installed, a single pole single throw type of remote control is normally required by the automation equipment. In effect, this is connected across the remote switch as shown in Figure 5.

FIGURE 5



Some automation systems control the power supply with momentary contact switches. Such systems must be connected in conjunction with the NC/NO two push button control.

FIGURE 6



	AC INPUT 1 PHASE 60Hz.			DC OUTPUT						
TYPE	AMPERE MAX. OUTPUT 115V	AMPERE MAX. OUTPUT 230V	VA AT MAX. OUTPUT	NO LOAD VOLTAGE	D.C. AMPERE NOM.	D.C. AMPERE MAX.	EFFIC.	NET WEIGHT LBS.	OVERALL DIMENSIONS BASE D x W	OVERALL DIMENSIONS HEIGHT
N1-X30DM	15.2	7.6	1750	78	25	30	72%	128	16½X11"	27½
N1-X50DM	30.4	15.2	3500	78	45	53	79%	192	18X12½"	27½
N1-X75DM	44	22	5000	78	63	75	83%	244	20X13 3/4"	33½
	AC INPUT 3 PHASE 60Hz.			DC OUTPUT						
TYPE	AMPERE MAX. OUTPUT 208V	AMPERE MAX. OUTPUT 230V	VA AT MAX. OUTPUT	NO LOAD VOLTAGE	D.C. AMPERE NOM.	D.C. AMPERE MAX.	EFFIC.	NET WEIGHT LBS.	OVERALL DIMENSIONS BASE DXW	OVERALL DIMENSIONS HEIGHT
N3-X50DM	7.4	6.7	2600	80	45	53	80%	155	17 3/4X12"	30 1/8
N3-X75DM	11	10	4000	80	63	75	84%	188	17 3/4 X 13"	32 ¼
N3-X75/95DM	16	14.4	5700	95	83	95	86%	298	20 X 15 3/4"	37
N3-X95/140DM	26.4	24	9500	110	120	140	85%	332	22 3/4 X 15 3/4"	40
N3-X160DM	33.4	30	12000	120	160	160	88%	540	23X18½"	45

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TECHNICAL DATA
N1 & N3 SERIES POWER SUPPLIES

10/25/68

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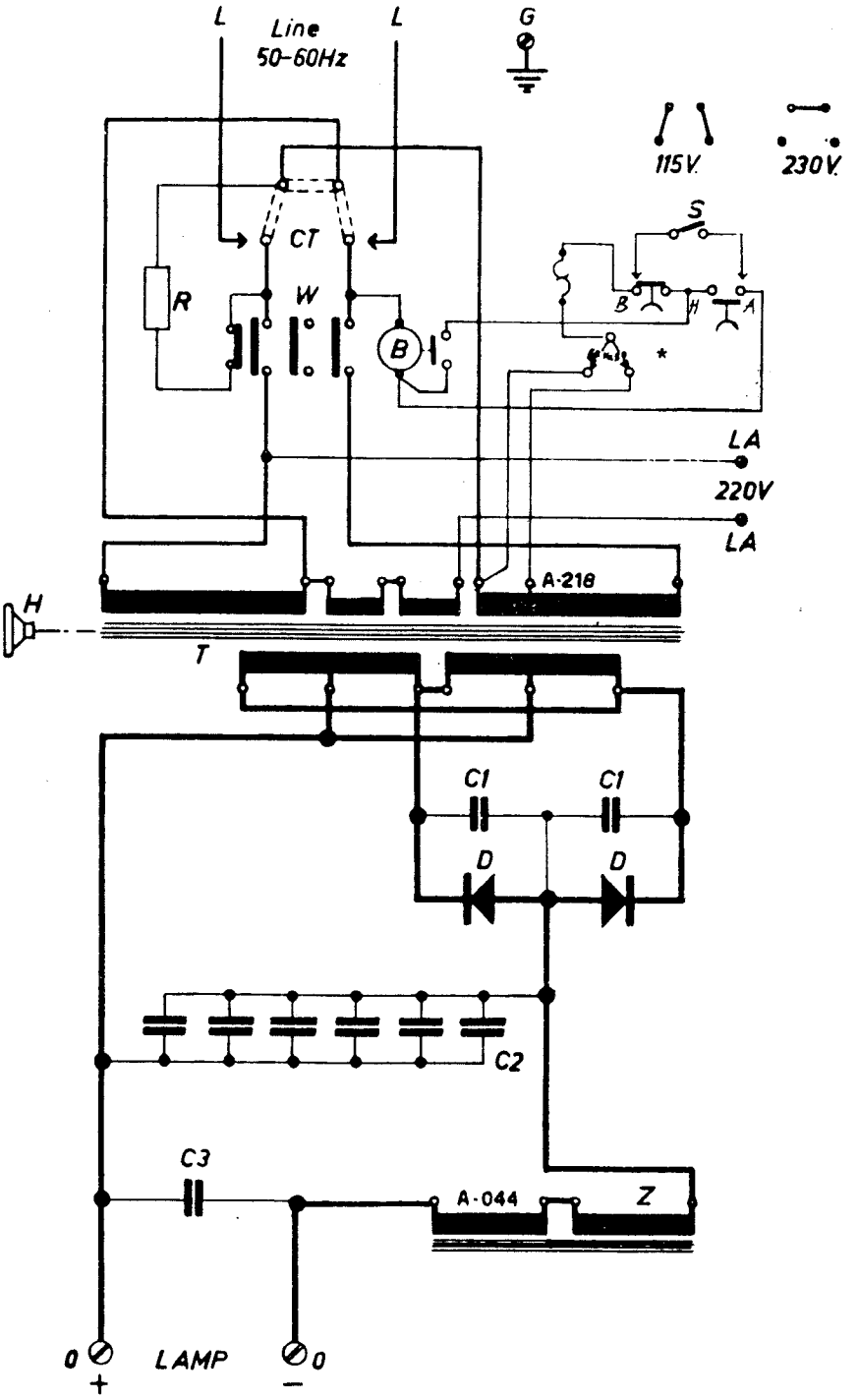
N1-X30 POWER SUPPLY
450/600 Watt 50/60 Hz.
Electrical Schematic

Date: 11/18/70

Drawing: S24526



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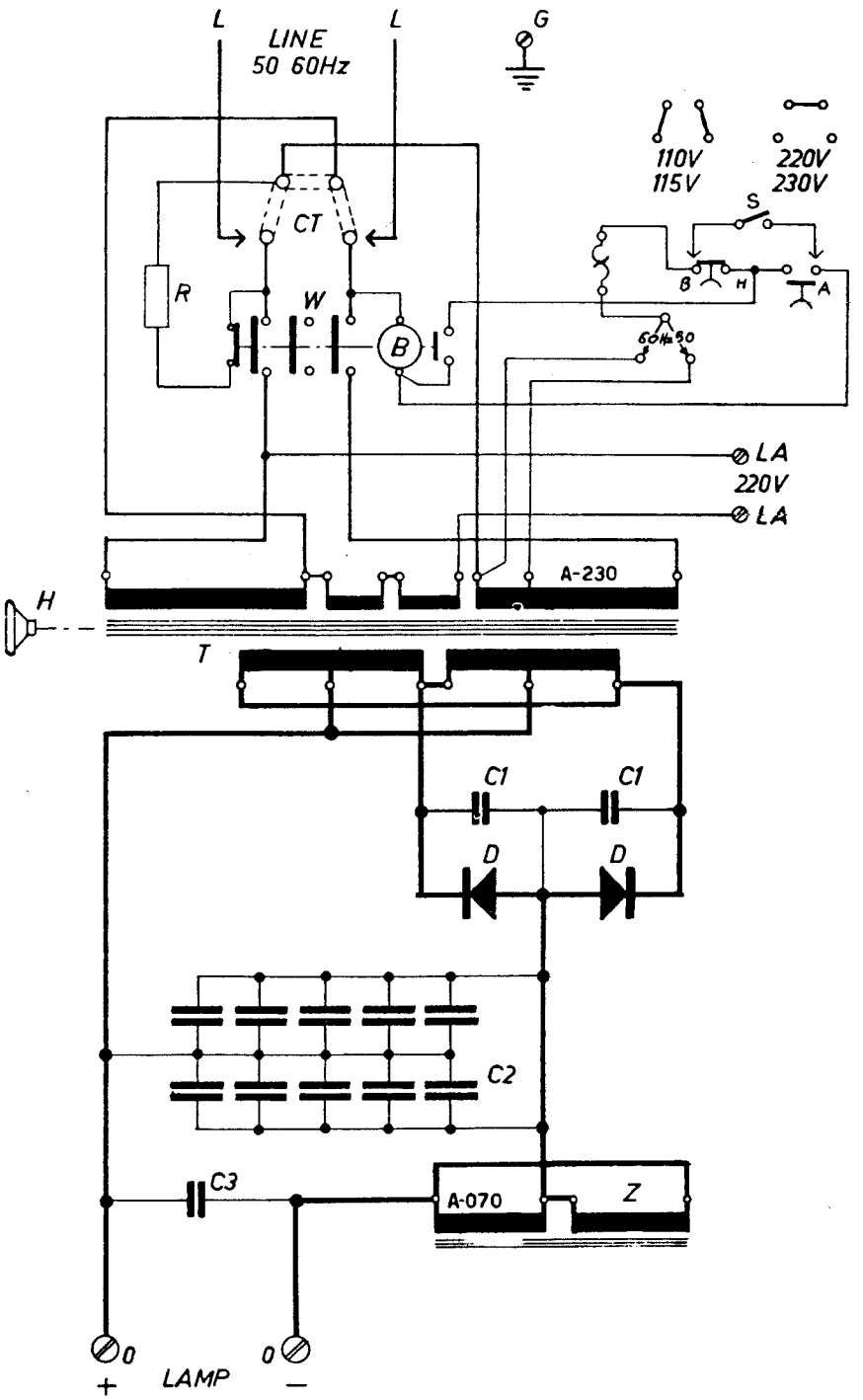
N1-X50 POWER SUPPLY
900/1000 Watt 50-60 Hz.
Electrical Schematic

Date: 9/2/70

Drawing S25014



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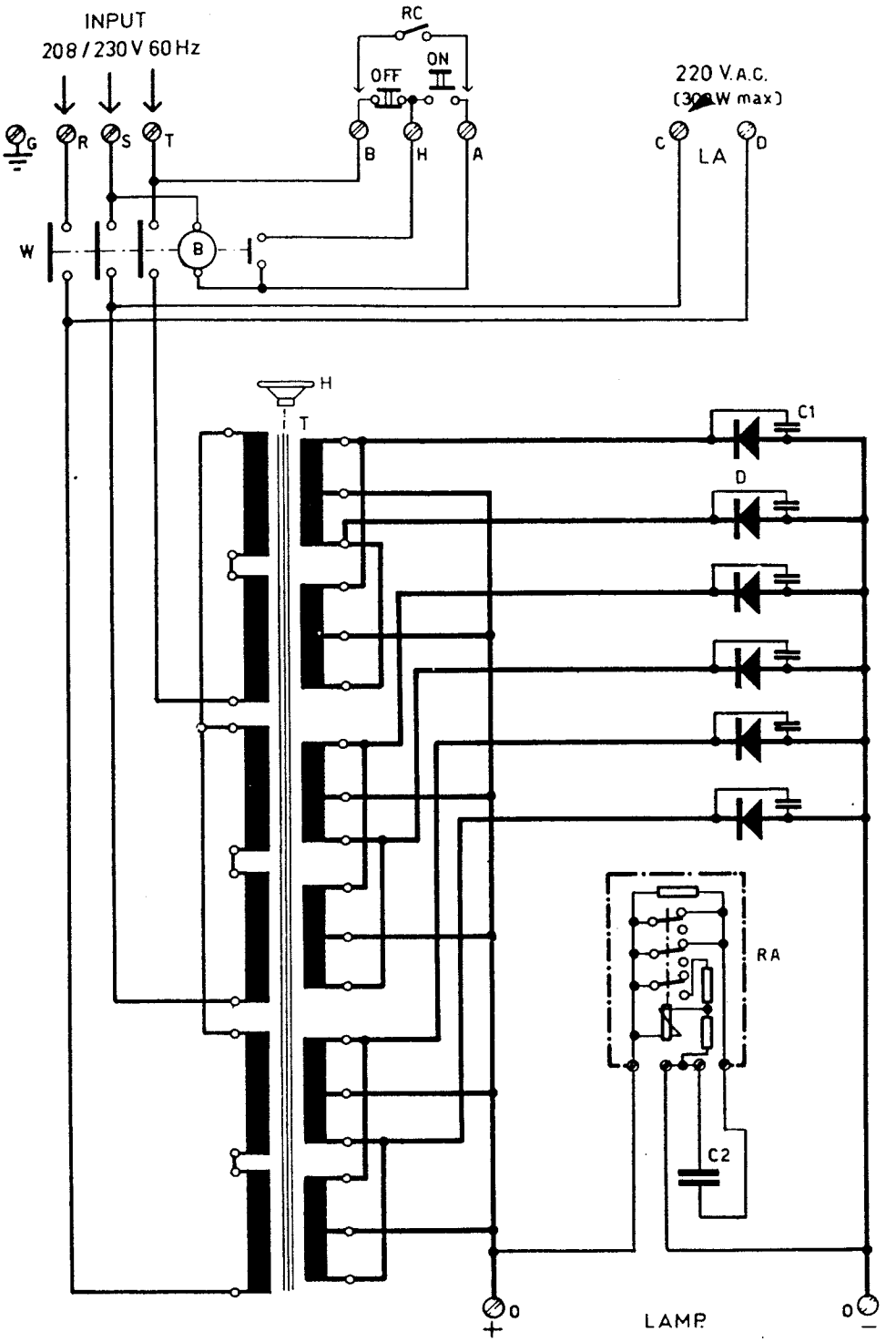
N3-X50 and N3-X75 POWER SUPPLY
900 and 1600 Watt 60 Hz.
Electrical Schematic

Date: 9/2/70

Drawing S27315



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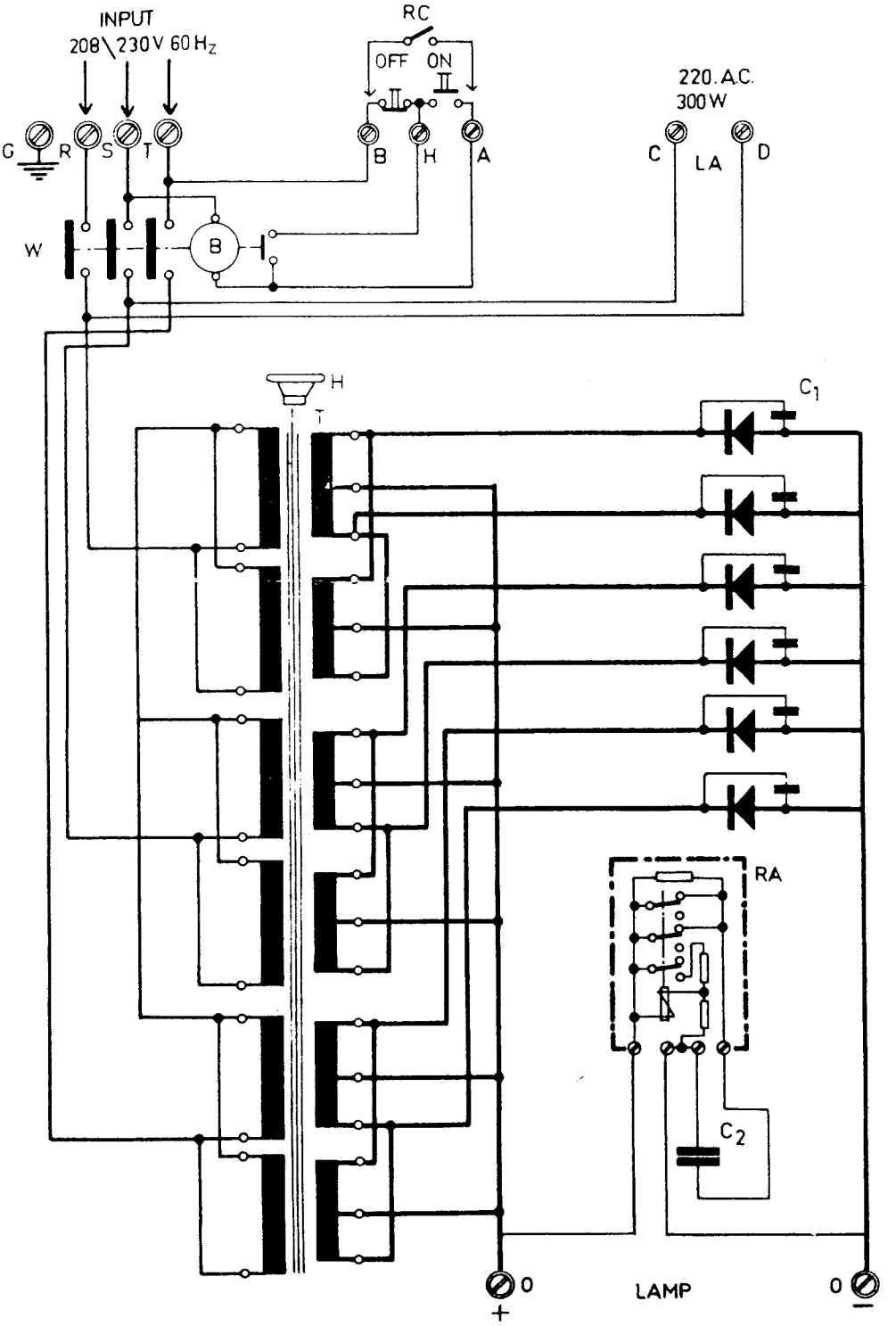
N3-X75/95 POWER SUPPLY
1600/2500 Watt 60 Hz.
Electrical Schematic

Date: 9/2/70

Drawing S27319



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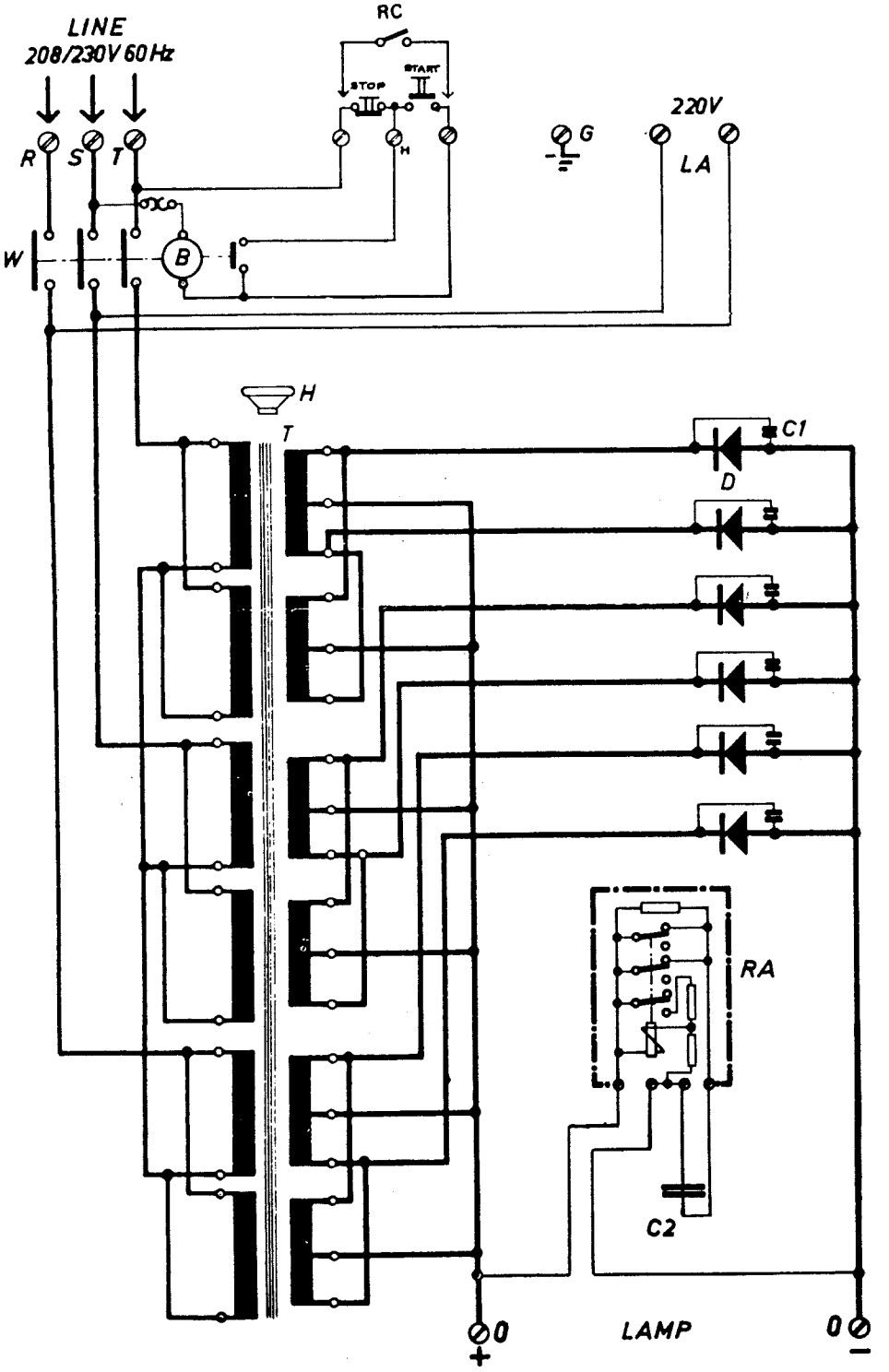
N3-X95/140 POWER SUPPLY
2500/4000 Watt 60 Hz.
Electrical Schematic

Date: 9/2/70

Drawing S25528

X Booth # 1



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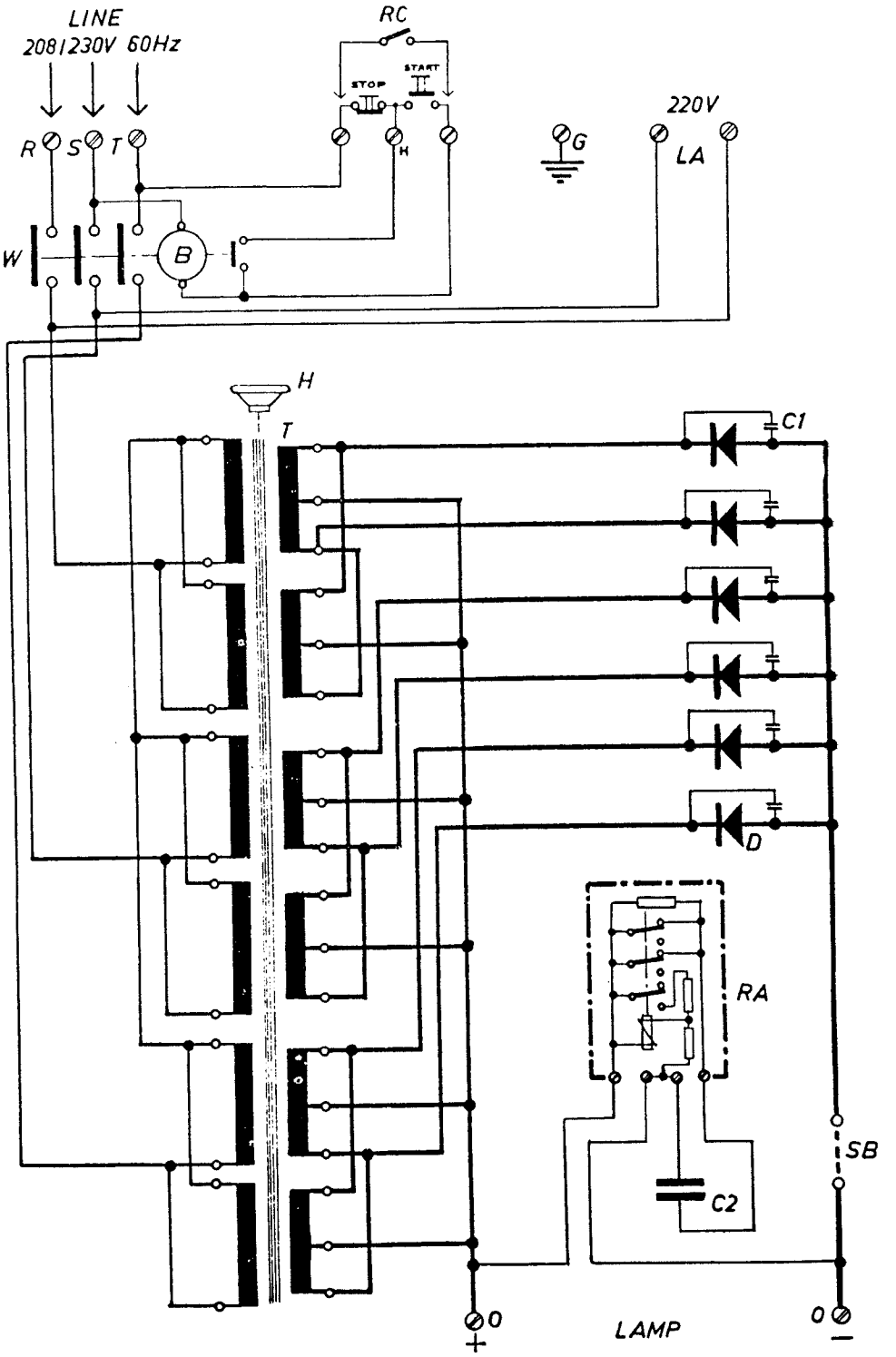
N3-X160 POWER SUPPLY
6500 Watt 60 Hz.
Electrical Schematic

Date: 9/2/70

Drawing S25730



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IREM POWER SUPPLY

Parts

Date: 11/18/70

N1-X30-60 Hz. and N1-X30/2-50/60 Hz.

CR	DESCRIPTION	TYPE	TQ	MANUFACTURER
CT	Line and voltage change terminals			IREM
W	Main switch	LIT/K915 III	1	Siemens - Germany
B	Main switch coil	110 V-60 Hz.	1	Siemens - Germany
R	Resistor fixed 220 ohm	RSL/4	1	SECI - Milan
TP	Thermal protector - Klixon 207	L185/2	1	Texas Instruments-USA
RC	Remote control terminals	90/Cgi	4	Cafrullo - Milan
S	Tumbler swtich	G/1101	1	GBC - Milan
LA	220 V terminals	90/Cgi	2	Cafrullo - Milan
H	Regulation hand wheel	4809	1	Elebak - Milan
T	Variable coupling transformer	A-218	1	IREM
D	Diode silicon 25A 1000 PIV	25 AR	2	Westinghouse Italy
C1	Capacitor, fixed 0.5 uF 500 V	AR20C1/S1	2	ICAR - Milan
C2	Capacitor fixed, electrolytic 1000 uF 80 V	STAB-EP41H	6	ICAR - Milan
C3	Capacitor fixed 50 uF 150 V	STAB-21J5	1	ICAR - Milan
Z	Filter impedence	A044	1	IREM
O	Output terminals			IREM

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IREM POWER SUPPLY

Parts

Date: 9/8/70

N1-X50 Power Supply 50/60 Hz.

CR	DESCRIPTION	TYPE	TQ	MANUFACTURER
CT	Line and voltage change terminals			IREM
W	Main switch	LIT/K915 III	1	Siemens-Germany
B	Main Switch coil	110 V-60 cps	1	Siemens-Germany
R	Resistor fixed 220 ohm	RSL/4	1	SECI-Milan
TP	Thermal protector-Klixon 207	L185/2	1	Texas Instrument-US
RC	Remote control terminals	90/Cgi	4	Cafrullo-Milan
S	Tumbler switch	G/1101	1	GBC-Milan
LA	220 V terminals	90/Cgi	2	Cafrullo-Milan
H	Regulation hand wheel	3332/1	1	Elebak-Milan
T	Variable coupling transformer	A-230	1	IREM
D	Diode silicon 25A 1000 PIV	BYZ 15	2	Philips
C1	Capacitor, fixed 0,5 uF 500 V	AR20C1/S1	2	ICAR-Milan
C2	Capacitor fixed, electrolytic 1000 uF 80 V	STAB-EP41H	10	ICAR-Milan
C3	Capacitor fixed 50 uF 150 V	STAB-21J5	1	ICAR-Milan
Z	Filter impedence	A070	1	IREM
O	Output terminals			IREM

N1-X50 Power Supply 60 Hz.

CT	Line and voltage change terminals			IREM
W	Main switch	LIT/K915 III	1	Siemens-Germany
B	Main switch coil	115 V - 60 cps	1	Siemens-Germany
R	Resistor fixed 220 ohm	RSL/4	1	SECI-Milan
TP	Thermal protector - Klixon 207	L185/2	1	Texas Instruments-US
RC	Remote control terminals	90/Cgi	2	Cafrullo-Milan
S	Tumbler switch	G/1101	1	GBC-Milan
LA	220 V. terminals	90/Cgi	2	Cafrullo-Milan
H	Regulation hand wheel	4809	1	Elebak-Milan
T	Variable coupling transformer	N1-11 (A212)	1	IREM
D	Diode Silicon 30A 1000 PIV	BYZ15	2	Philips
C1	Capacitor, fixed 0.5 uF 500 V	AR20C1/S1	2	ICAR-Milan
C2	Capacitor fixed, electrolytic 1000 uF 80V	STAB-EP41H	10	ICAR-Milan
C3	Same as C2			
Z	Filter impedence	A070	1	IREM
O	Output terminals			IREM

XETRON
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CARBONS, INC.
CEDAR KNOLLS, N. J. 07927
201 - 267-8200

IREM POWER SUPPLY

Parts

Date: 9/8/70

N3-X50 Power Supply 60 Hz.

CR	DESCRIPTION	TYPE	TQ	MANUFACTURER
R-S-T	Line terminals		1	IREM
W	Main switch 16 A	LIT/K915 III-5-1	1	Siemens-Germany
B	Main switch coil	220 V 60 Cps	1	Siemens-Germany
LA	220 V. terminals	90/Cgi	2	Cafrullo-Milan
RC	Remote control terminals	90/Cgi	2	Cafrullo-Milan
H	Regulation hand wheel	3332/1	1	Elebak-Milan
T	Variable coupling transformer	A-235 (900W)	1	IREM
T	" " "	A-236 (1600W)		
D	Diode silicon 15 AR 1000 PIV	15 AR	6	Westinghouse
C1	Capacitor 0.22 mf 630V	1.03.091	6	ARCO-Bologna
C2	Capacitor electrolytic	C36B342F075		
	3400 mF 75 V	AE6D	1	Sprague Creas
RA	Ignition relay		1	IREM
O	Output terminals		2	IREM

N3-X75 Power Supply 60 Hz.

R-S-T	Line terminals		1	IREM
	Main switch 16 A	LIT/K915 III-5-1	1	Siemens-Germany
	Main switch coil	220V 60 cps	1	Siemens-Germany
LA	220V terminals	90/cgi	2	Cafrullo-Milan
RC	Remote control terminals	90/cgi	2	Cafrullo-Milan
H	Regulation hand wheel	3332/1	1	Elebak-Milan
T	Variable coupling transformer	A-236(1600W)	1	IREM
D	Diode silicon 15 AR 1000 PV	15 AR	6	Westinghouse
C1	Capacitor 0.22 mf 630 V	1,03.091	6	ARCO-Bologna
C2	Capacitor electrolytic	C36B342F075		
	3400 mf 75 V	AE6D	1	Sprague Creas
RA	Ignition relay		1	IREM
O	Output terminals		2	IREM

N3-X75/95 Power Supply 60 Hz.

R-S-T	Line terminals		1	IREM
W	Main switch 16 A	LIT/K915	1	Siemens-Germany
B	Main switch coil	220 V 60 cps	1	Siemens-Germany
LA	220 V terminals	90/Kgi	2	Cafrullo-Milan
RC	Remote control terminals	90/Kgi	2	Cafrullo-Milan
H	Regulation hand wheel	3333/1	1	Elebak-Milan
T	Variable coupling transformer	N3-32(A250)	1	IREM
D	Diode silicon 25 AR 1000 PIV	25 AR	6	Westinghouse
C1	Capacitor 0.22 mf 630 V	1.03.091	6	ARCO-Bologna
C2	Capacitor electrolytic			
	4700 mf 100-125 V	FC.85	1	MICRO-France
	Ignition relay	25700	1	IREM
O	Output terminals		2	IREM

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IREM POWER SUPPLY

Parts

Date: 9/8/70

N3-X95/140 Power Supply 60 Hz.

CR	DESCRIPTION	TYPE	TQ	MANUFACTURER
R-S-T	Line Terminals		1	IREM
W	Main Switch 32A	LIT/K915 III-2	1	Siemens-Germany
B	Main Switch Coil	220V 60 Cps.	1	Siemens-Germany
TP	Thermal protector-Klixon 207	L 185/2	1	Texas Instruments-US
LA	220V terminals	90 Cgi	2	Cafrullo-Milan
RC	Remote control terminals	90 Cgi	2	Cafrullo-Milan
H	Regulation hand wheel	333/1	1	Elebak-Milan
T	Variable coupling transformer	A-246 (N3-29)	1	IREM
D	Diode Silicon 25 AR 1000 PIV	25 AR	6	Westinghouse
C1	Capacitor 0.22 mf 630V	1.03.091	6	ARCO - Bologna
C2	Capacitor electrolytic 10000 mf 100-125 V	FC 85	1	MICRO-France
RA	Ignition relay		1	IREM
O	Output terminals		2	IREM

N3-X160 Power Supply 60 Hz.

R-S-T	Line Terminals		1	IREM
W	Main Switch 32A	LIT/K915 III	1	Siemens-Germany
	Main Switch Coil	220V 60cps	1	Siemens-Germany
LA	220V terminals	90/Cgi	2	Cafrullo-Milan
RC	Remote Control Terminals	90/Cgi	2	Cafrullo-Milan
H	Regulation hand wheel	3334/1	1	Elebak-Milan
T	Variable coupling transformer	N3-13(A224)	1	IREM
D	Diode silicon 30A 1000 PIV	BYZ 15	6	Philips
C1	Capacitor 0.22 mf 630 V.	1.03.091	6	ARCO-Bologna
C2	Capacitor electrolytic 10000 mf 100-125 V.	FC85	1	MICRO-France
RA	Ignition relay	25701	1	IREM
SB	Shorting bar		1	IREM
O	Output terminals		2	IREM