

# **Operating Manual**

## **Clipperton L**



**Dentron**



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# Introduction

The DenTron Clipperton L linear amplifier was designed to provide maximum legal power inputs in all modes for the Amateur Service, with a full compliment of controls and metering functions. The unit is low profile with all-metal construction and forced air cooling. Four tough, but economical 572-B triodes are used in grounded grid to deliver a full 1000 Watts DC input on CW, and 2000 Watts PEP input on SSB. A dual primary transformer allows for both 117V and 234V AC operation, and dual HV secondary taps provide for hi-lo power switching. This makes for uniform efficiencies at both the 1000 and 2000 Watt power levels. The appropriate tap is selected through front panel switching.

The Clipperton L requires between 65 and 150 Watts drive for full power input, thus making it compatible with virtually any exciter. ALC is provided for, with rear panel adjustment. Front panel controls include a linear bypass function, bandswitching from 160 - 15 meters, and metering of plate voltage and plate current with a switchable illuminated dual scale meter.

Your new Clipperton L amplifier meets or exceeds all FCC specifications, and shares the same heritage as the other DenTron amplifiers; modular design and careful attention to craftsmanship and detail.

## **!! Warning !!**

**MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE OUTSIDE OF THE CABINET!  
CONTACT WITH VOLTAGES IN THIS AMPLIFIER CAN BE FATAL!**

# Specifications

## Frequency Ranges:

160 Meter Band	1.8 - 2.5 MHz
80 Meter Band	3.45 - 4.6 MHz
40 Meter Band	6.00 - 9.0 MHz
20 Meter Band	11.00 - 16.00 MHz
15 Meter Band	20.95 - 23.50 MHz

The Clipperton L will cover most MARS frequencies just outside the Amateur Bands. (With proper FL1 and band switch modification, the unit will also cover the 10 meter amateur band.)

Modes: USB, LSB, CW, RTTY, SSTV

Power Requirements: 234/117 VAC 50/60 Hz

RF Drive Power: 150 Watts maximum, and 65 Watts RMS minimum for 1 KW DC input.

DC Plate Voltage: SSB (Idle + 2700V approximate)

CW (Idle + 1800V approximate)

Duty Cycle: 100% SSB, CW, RTTY, SSTV

Input Impedance: 50 Ohms nominal

Input VSWR: 1.5 to 1 average

Output Impedance: 50 Ohms nominal

Antenna load VSWR: 2 to 1 maximum

ALC: negative going, adjustable from rear panel

Spurious Emissions: IMD - greater than 30 db down

Harmonics - greater than 40 db down

FCC Type Accepted

Size: H 6" x W 15" x D 17"

Weight: 46 pounds

## **!! Warning !!**

TO TAKE FULL ADVANTAGE OF THE CLIPPERTON L COOLING SYSTEM, IT IS HIGHLY RECOMMENDED THAT THE UNIT BE RAISED UP WITH THE PROVIDED BAIL UNDER NORMAL OPERATING PROCEDURES.

# Theory of Operation

AC power is supplied to the Clipperton L through fuse F1 and PWR Switch SW-2. AC PWR is also applied through SW-5 safety interlock switch. 117 or 234 Volt operation is obtained by changing jumpers on PWR network terminal block.

This puts AC PWR to the transformer T1. The first secondary winding of T1 supply AC PWR to the voltage doubler, 950 VAC on SSB and 660 on CW. The voltage doubler consists of diodes D3 through D14 and Capacitors C32 through C39. The voltage doubler provides 2700 VDC for SSB or 1800 VDC for CW to the plates of the 572B tubes in idle condition. Plate current is measured across R23, and Plate Voltage through R20, R21, and R22.

Another secondary winding of T1 supplies 12V circuit for relay and lamp operation.

A third secondary winding of T1 provides 6.3VAC for filaments of 572B tubes. RFC-2 is a RF filament choke.

The 2 one ohm resistors R1 and R2 act as safety valves for B+ to the tubes in case of tube shorts. These are one ohm, one watt carbon resistors in parallel.

Input signal is applied to J1 if amp is in standby and is then sent out to J2 or RF output. If amp is in operation, signal passes through FL-1, an impedance matching device, through C7 and C8 to cathode (filament) of tubes. It is amplified through four 572B tubes and then passed through C9. C9 functions as a DC blocking capacitor. The amplified signal is then sent to the tank circuit consisting of L1, L2, C10, C11, C12, C13, C14, C15 and C16. These allow the amp to be tuned from 1.8 to 22 MHz efficiently.

RFC-3 is another safety device. Its purpose is, if C9 shorts, the DC potential is sent to ground through RFC-3 causing the mainfuse to go and also the 1 ohm, one watt resistors to open. This keeps a DC potential off the feedline and antenna.

ALC is derived from voltage dividers C17 and C18, and rectified negative by D2 and limited by R10, R9, and R8 back to the exciter for ALC control.

If at any time you require service on DenTron equipment, feel free to contact our Service Department for assistance.

# Cautions

1. Make no attempt to put the Clipperton L in service outside of the cabinet. Contact with voltages in this amplifier can be *fatal to the human body*.
2. Never attempt to operate the Clipperton L with drive power of more than 150 watts!
3. Never attempt to operate the Clipperton L without first connecting it to an antenna with an SWR of less than 2:1, or a 50 Ohm dummy load of sufficient power handling capacity or serious damage may result to the amplifier.
4. Never run Amplifier from an extension cord.
5. Do not attempt to change jumper connections on back of the Amplifier without first removing power plug from the Clipperton L.
6. Do not cover the top of the Clipperton L with books, papers or other pieces of equipment or overheating may result.
7. Do not use different tuning procedures other than indicated in this manual.
8. When cleaning the Clipperton L, never blow high pressure air directly into the fan blades. Spinning the fan at higher speeds than it was designed for can cause damage and freeze the rotor assembly of the fan. Use brush in cleaning the fan assembly.

## **!! Warning !!**

IF ANY PROBLEMS OCCUR THAT ARE NOT EASILY REPAIRED IN THE FIELD, PLEASE CONTACT DENTRON RADIO COMPANY FOR TECHNICAL ASSISTANCE.

# !! Warning !!

MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE OUTSIDE OF THE CABINET!  
CONTACT WITH VOLTAGES IN THIS AMPLIFIER CAN BE FATAL!

## Unpacking Instructions

Carefully remove your Clipperton L from its packing carton making sure there is no damage evident from shipping. If there is any damage, notify the delivering shipper immediately, fully describing the damage.

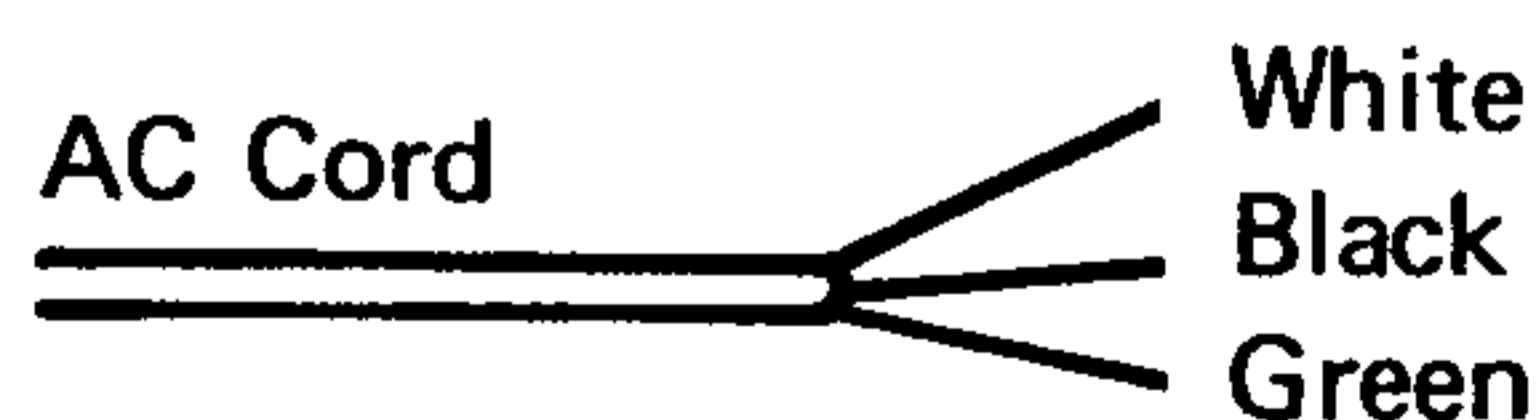
Fully complete the DenTron Registration card included in the information package and return it to DenTron. Do not destroy the packing material, since it will be usable later should you require factory service or need to transport the amplifier for any other reason.

In general, the location of your new Clipperton L is not critical. Be certain, however, to leave enough room behind the unit to allow for proper air flow over and under the unit, as well as behind it.

## Installation

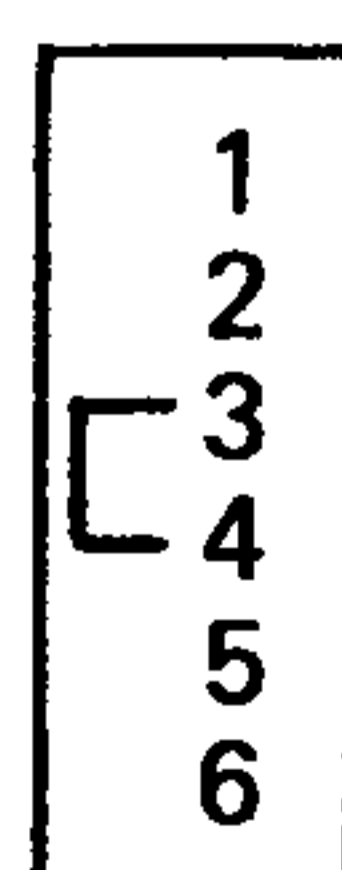
The Clipperton L is factory wired to operate from 117 VAC line. If 234 VAC is desired, you will have to rewire the power transformer primary per the schematic diagram. The terminal block is located on the rear panel, under cover box.

1. Position the Clipperton L so that the rear, sides, and top of the unit are clear of all obstructions. This will assure adequate air circulation.
2. Connect a wattmeter and a 50 ohm load (such as a DenTron Big Dummy), to the output connector using RG8 or its equivalent.
3. Connect the Clipperton keying lead to your transmitter using shield cable (See the interconnect diagram.) The Clipperton requires closed contacts on transmit.
4. Connect the RF input jack to the transmitter RF output using 50 ohm coax.
5. Connect the Clipperton ALC output to the transmitter ALC input using shielded cable. (See your exciter owner manual.)
6. Connect as short a ground lead as possible from a good earth ground to the unit's rear panel GRD terminal.



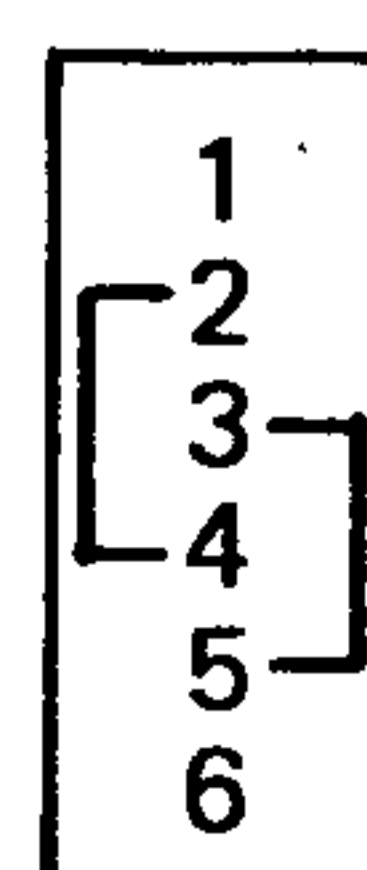
White = 1 side of 234V (117V)  
Black = other side of 234V (117V)  
Green = Ground

### 234 Volt Operation



Pins 3 to 4

### 117 Volt Operation



Pins 2 to 4  
3 to 5



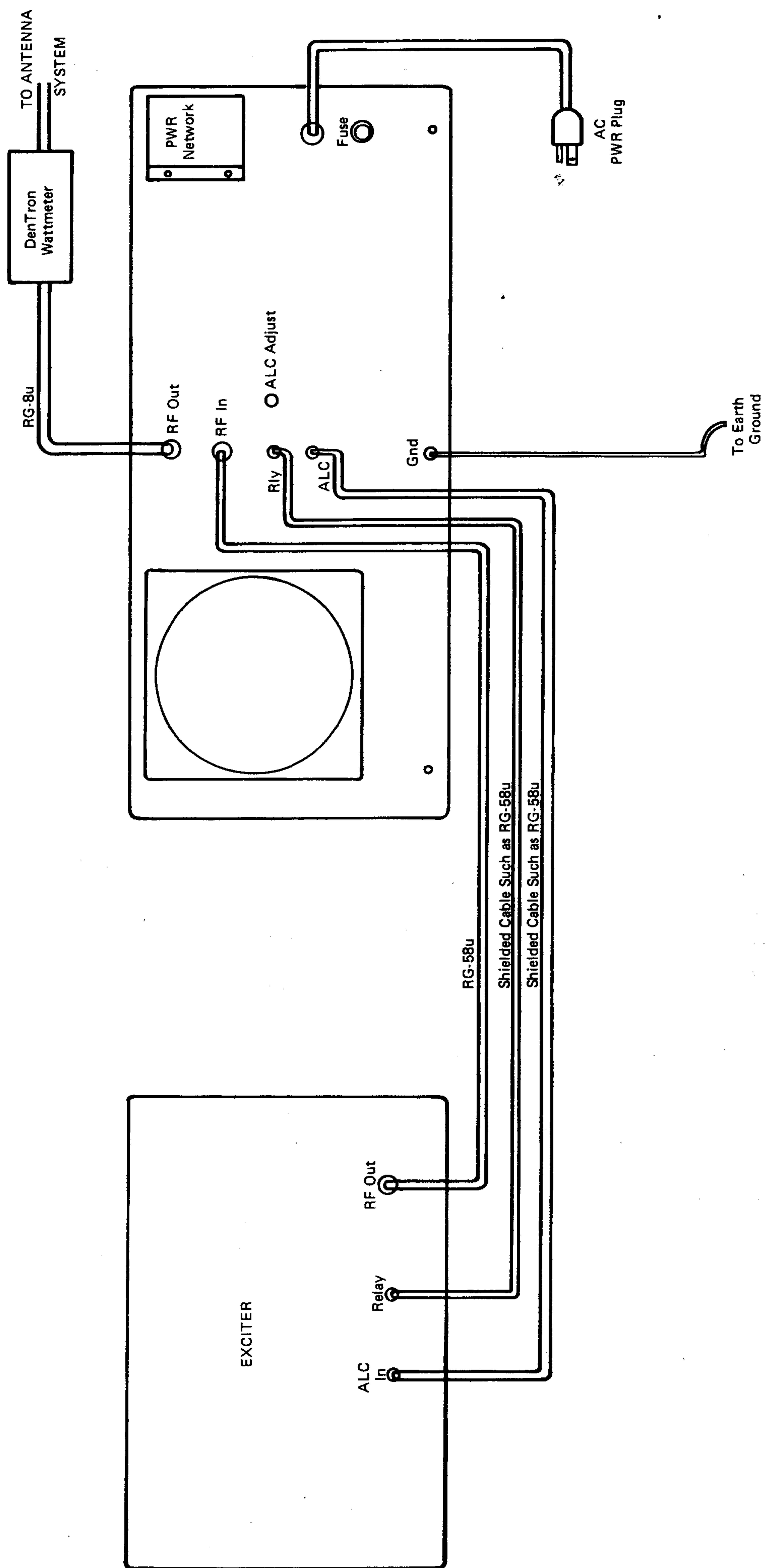
# Tuning Procedure

1. Position the Clipperton front panel switches as follows:  
PWR - OFF  
STDBY/OPRTE - STDBY  
CW/SSB - CW  
METER SWITCH - PLATE VOLTAGE (Vp)
2. Insert the AC line cord into the appropriate outlet.
3. Turn the main power switch to the "ON." Plate voltage should read approximately 1800 VDC, and plate current should read 0 MA.
4. Allow a few seconds for tube warm up.
5. (160M through 20M), set the load control at 1. (15M), set the load control at 3.
6. Set the tune and band switch to the band being used.
7. Tune your transceiver as you normally would in the transmit position, i.e. tune for maximum power out of the transmitter and then back off to approximately 50 watt output point, (use carrier level control to set power level).
8. Set the standby/operate switch to the operate position and the CW/SSB switch to the CW position, meter switch to current (Ip).
9. Tune the Clipperton L for maximum output in the CW position on a wattmeter such as the DenTron W-2 Wattmeter. 1 KW DC input will not be achieved at this point. Increase drive level control and re-tune amplifier until 1 KW DC input is achieved.  
NOTE: Check the position of the CW/SSB switch to make sure it is in the CW position.
10. Use the following formula to calculate the DC input level to the Clipperton:  
PLATE CURRENT X PLATE VOLTAGE = POWER  
EXAMPLE: 1500 volts DC x .666 Amps DC = 1kw DC Input
11. Once you have reached the 1 KW DC input level in the CW mode, you need only put the CW/SSB switch in the SSB position for voice operation.

## NOTES:

1. Remember: 1kw DC input is the legal limit.
2. As stated in Step 7, tuning and loading the exciter to a normal power level is preferred as you can reduce the Clipperton loading to maintain 1kw DC input. This technique helps reduce unwanted harmonics and Rf distortion.

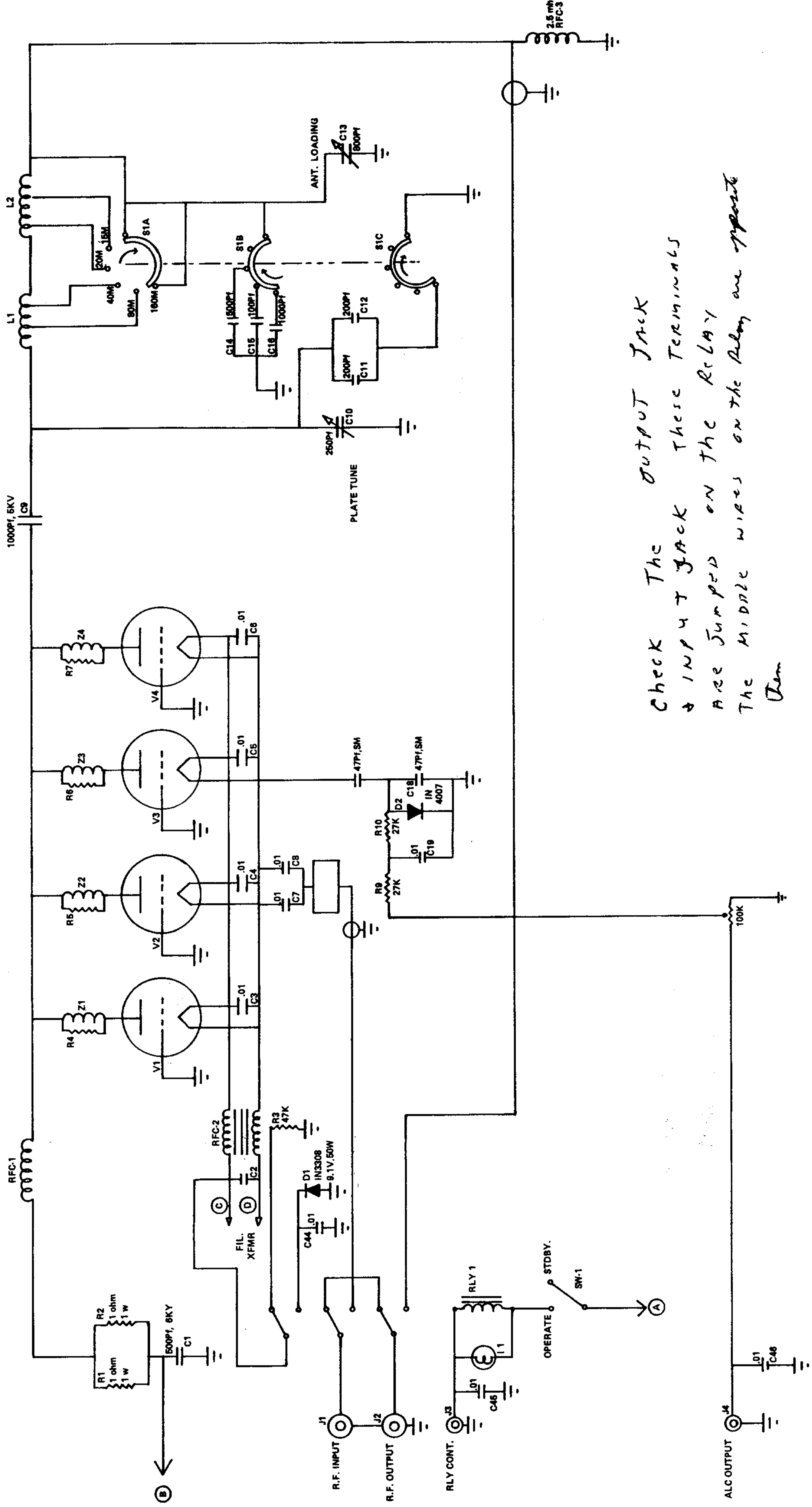
# Clipperton L



# Clipperton L - Parts List

<b>RESISTORS:</b>	
R1, R2	1 ohm, 1w
R3	47k
R4, R5, R6, R7	100 ohm, 2w
R8	100k, pot
R11	380 ohm, 25w
R12 through R19	100k, 2w
R20 through R22	1M, 1%
R23	.05 ohm, 1%
R9, R10	27k, ½w
<b>CAPACITORS:</b>	
C1	500pf
C2 through C8	.01 uf
C9, C16	1000pf, 5kv
C10	250pf variable
C11, C12	200pf
C13	800pf, variable
C14	100pf
C15	500pf
C17, C18	47pf, sm
C19, C40, C42, C43, C44, C45, C46	.01
C20 through C31	.01
C32 through C39	100uf@500v
C41	600uf@50v
<b>INDUCTORS:</b>	
FI-1	Input matching network
Rfc-1	Plate choke
Rfc-2	Filament choke
Rfc-3	2.5 mh choke
L1, L2	Output tuning coils
Z1 through Z4	5T, 18 GA on R4 through R7
<b>DIODES:</b>	
D1	IN 3308, 9.1V, 50W zener
D2	IN 4007
D3 through D14	M4G5
D15	IN 4007
<b>TUBES:</b>	
V1 through V4	572B's
<b>INDICATORS-BULBS:</b>	
I1	# 382
I2	# 382
I3	# 386
I4	# 386
<b>SWITCHES:</b>	
S1 - A, B, C	Band Switch
Sw1	STDP Toggle
Sw2	STDP Toggle
Sw3	STDP Toggle
Sw4	DTDP Toggle
Sw5	Interlock
<b>MISC:</b>	
T1	Plate & Fil. XFMR
M1	Current/Voltage Meter
B1	Blower Motor
RLY-1 (12V cont. RLY)	3PDT
J1, J2	SO239
J3, J4	RCA Jacks
F1	12A AT 117v, 18A AT 234X

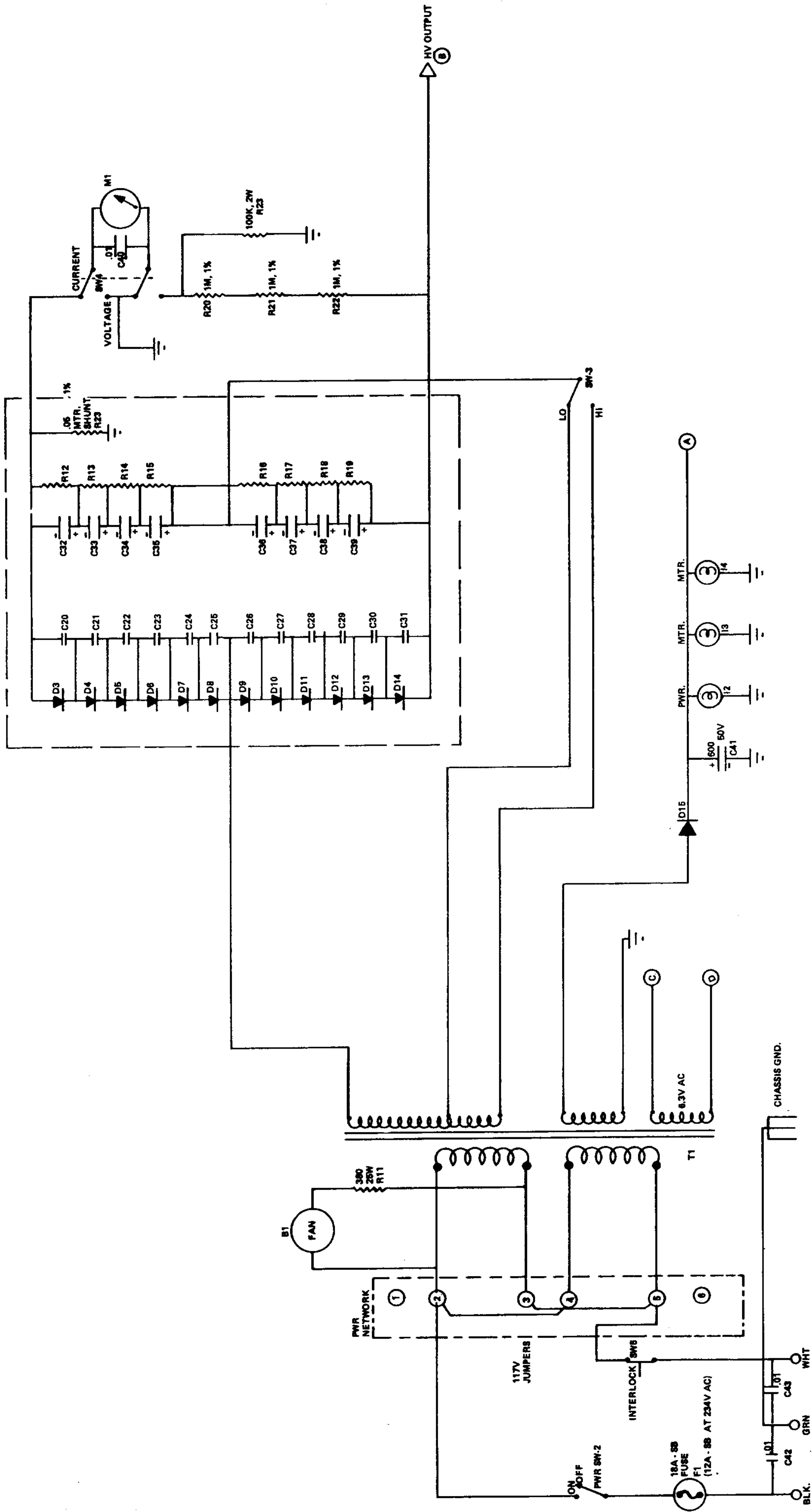
# Clipperton L Schematic



Check The OUTPUT JACK  
 & INPUT JACK These TERMINALS  
 ARE JUMPED ON THE RELAY  
 THE MIDDLE WIRES ON THE RELAY ARE OPPOSITE

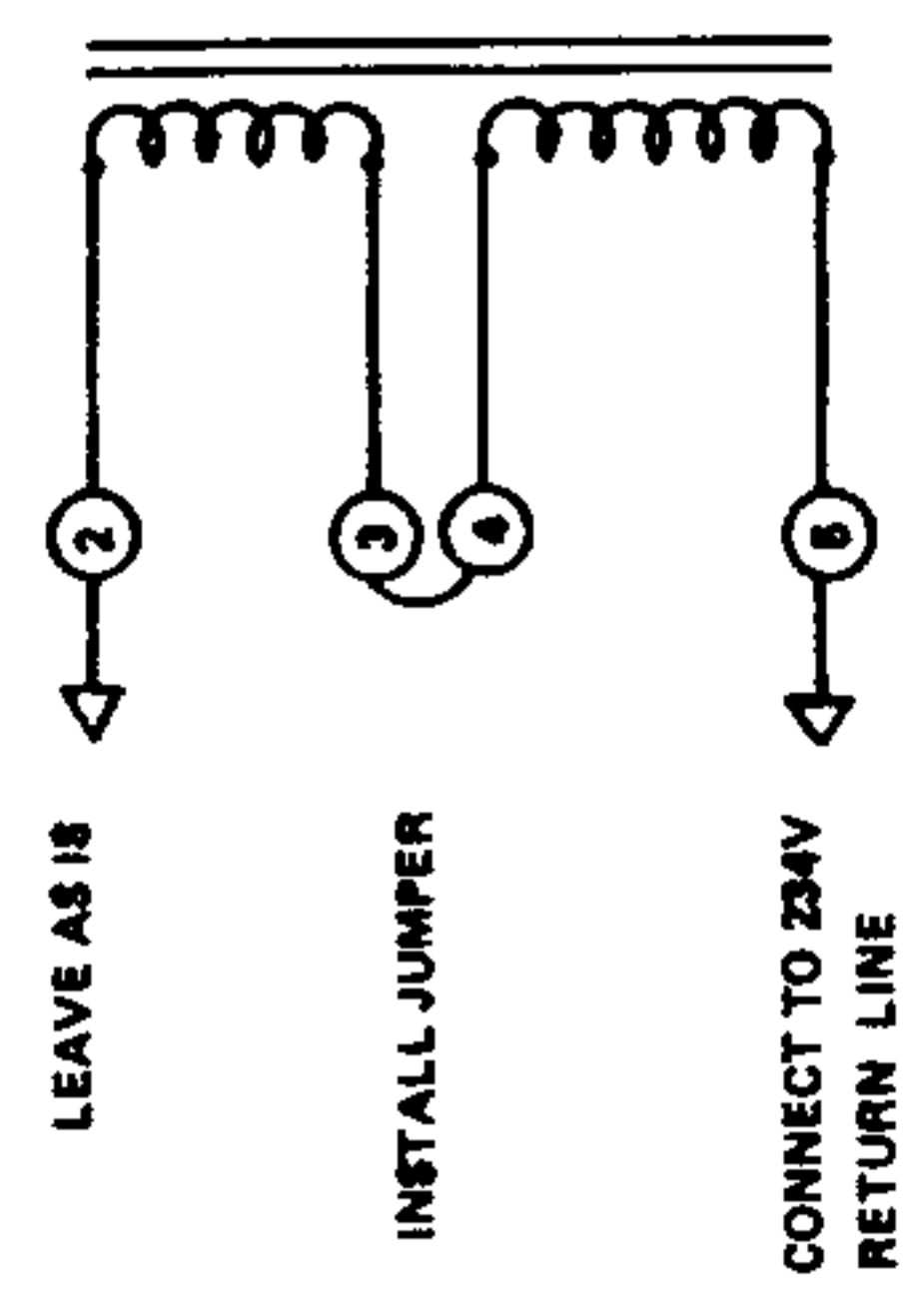
Dem

PC 2001



# Clipperton L HV Supply

234 AC PRIMARY HOOKUP



117V AC LINE POWER