

# Clipperton V Instruction Manual

Dentron



# Introduction

The DenTron Clipperton V was designed to provide amateurs with a low cost 500 watt amplifier for that something extra on the 2 meter band. The unit uses a 4CX250B in grounded grid, which makes it usable with most 2 meter rigs that have outputs in the 10 to 20 watt range.

The Clipperton V is a low profile unit with all metal construction, forced air cooling, RF keying, and a full compliment of controls and metering functions. A dual primary power transformer allows for 117V or 234V AC operation.

The Clipperton V's self contained power supply has separate plate and screen supplies to insure stability, and an adjustable bias supply for maximum versatility. The bias supply is factory set for class AB2 linear service.

Your new Clipperton V shares the same heritage as the other DenTron amplifiers and when operated properly, will provide many years of enjoyable and dependable service.

**!!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    144-148 MHz  
                          50-54 MHz with 6 meter modification kit  
                          30-165 MHz (custom from factory for commercial applications)

4CX250B ceramic/metal tetrode tube  
Pressurized chassis tube cooling system  
Modes    USB, LSB, CW, RTTY, FM  
Power requirements    117/234 Vac 50/60 Hz  
RF Drive Power    25 watts maximum, 10 watts  
RMS minimum for 500 watt dc input  
RF Sensing Keying circuit with delay feature for SSB  
DC plate voltage    idle + 2250V approximate  
DC screen voltage    200V dc  
DC bias voltage    Variable 55 to 130V  
Input impedance    50 ohms nominal  
Output impedance    50 ohms nominal  
Antenna load VSWR    2:1 maximum  
Harmonic suppression    down 60 db or better  
Size - H 6" x W 15" x D 17"  
Weight    45 lbs.  
Input    500 watts

## **!!WARNING!!**

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

# CAUTIONS

1. Make no attempt to put the Clipperton V 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 V with drive power of more than 25 watts!
3. Never attempt to operate the Clipperton V without first connecting it to an antenna with an SWR of less than 2:1, or 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 V.
6. Do not cover the top of the Clipperton V 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 V, 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.
9. When returning unit for service it is imperative that you replace the tube packing material as received from factory.

## **!!WARNING!!**

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

# THEORY OF OPERATION

When the power switch is turned on, the power transformer supplies 800 VAC to a voltage double circuit consisting of diodes 1 thru 8 and capacitors 11 thru 16. This supplies the plate with approximately 2250 VDC in the standby mode.

A second winding on the transformers provides 250 VAC to a full wave bridge which gives approximately 350 VDC for the screen supply.

The transformer also supplies 105 VAC for the half wave bias supply of — 130 VDC, 6.3 VAC for the filaments of V1 and V2, and 12 VAC for the half wave 12 volt supply which operates the antenna changeover relay and panel lights.

After the power light has come on, indicating proper warm up, power is available to operate the internal antenna changeover system. When drive is applied to the input jack (J2) and with the standby/operation switch in the operate position, a portion of the drive is sampled by C28 then rectified by D15 and 16. This voltage turns Q1 on and a ground path is open for K1 and the relay closes.

Three functions are switched by K1. First, the bias of the tube is switched from cutoff to the operating class desired. Second, the input is switched to the cathode of V1. Third, the antenna is connected to the output link at the 4CX250B tank circuit.

The antenna changeover relay can also be operated thru J3. This requires a path to ground during transmit.

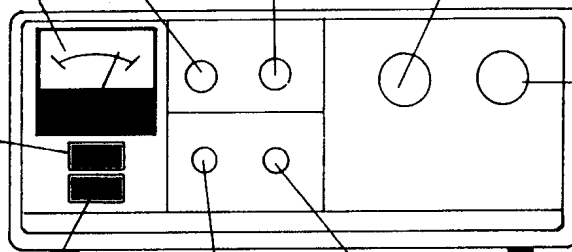
When operating SSB or CW, it will be necessary to use the delay function by adjusting the time Q1 stays on after drive has been removed. This is done by adjusting VR2 mounted on the front panel.

The tank circuit is series tuned. Series tuning places the tube output capacitance in series with the tuning capacitor (C1), effectively reducing tank circuit capacitance. This allows for a larger tank coil which might become unworkably small if parallel tuning was used. The output circuit is link coupled to the plate circuit by L2. A capacitor (VC2) in series with L2 provides adjustable loading of the amplifier to maintain efficiency.

**METER** - When combined with the meter switch allows the operator to monitor either plate voltage or plate current.

**DELAY** - Adjusts the amount of time the unit stays keyed after the drive has been removed.

**TUNE** - Tunes the plate circuit to the desired frequency.



**OFF/ON** - Applies power to the unit in the ON position. Disconnects power from the unit in the OFF position.

**LOAD** - Adjusts the amount of loading the antenna system puts on the plate circuit.

**STBY/OPR** - Bypasses the unit in the STBY position. Places the unit in the operating mode in the OPR position.

**POWER LIGHT** - Indicates power is available to operate the unit. It also indicates proper warm up time has elapsed for the 4CX250B.

**TRANSMIT LIGHT** - Indicates the unit is in the transmit mode.

**RF OUT** - This 50 ohm coaxial connector is used to connect the amplifier to an antenna, wattmeter\*, or dummy load.

**BIAS** - Adjusts bias voltage to the power amplifier.

**Primary Network** - (Remove cover) Used to wire the primary windings of the transformer for 110VAC or 220VAC service.

**RF IN** - This 50 ohm coaxial connector is used to connect the excitor to the amplifier.

**Power Cord** - Connects the unit to the power source.

**Key** - jack used to connect the unit to relay contacts for manual keying.

**GND** - Used to connect the unit to a proper earth ground.

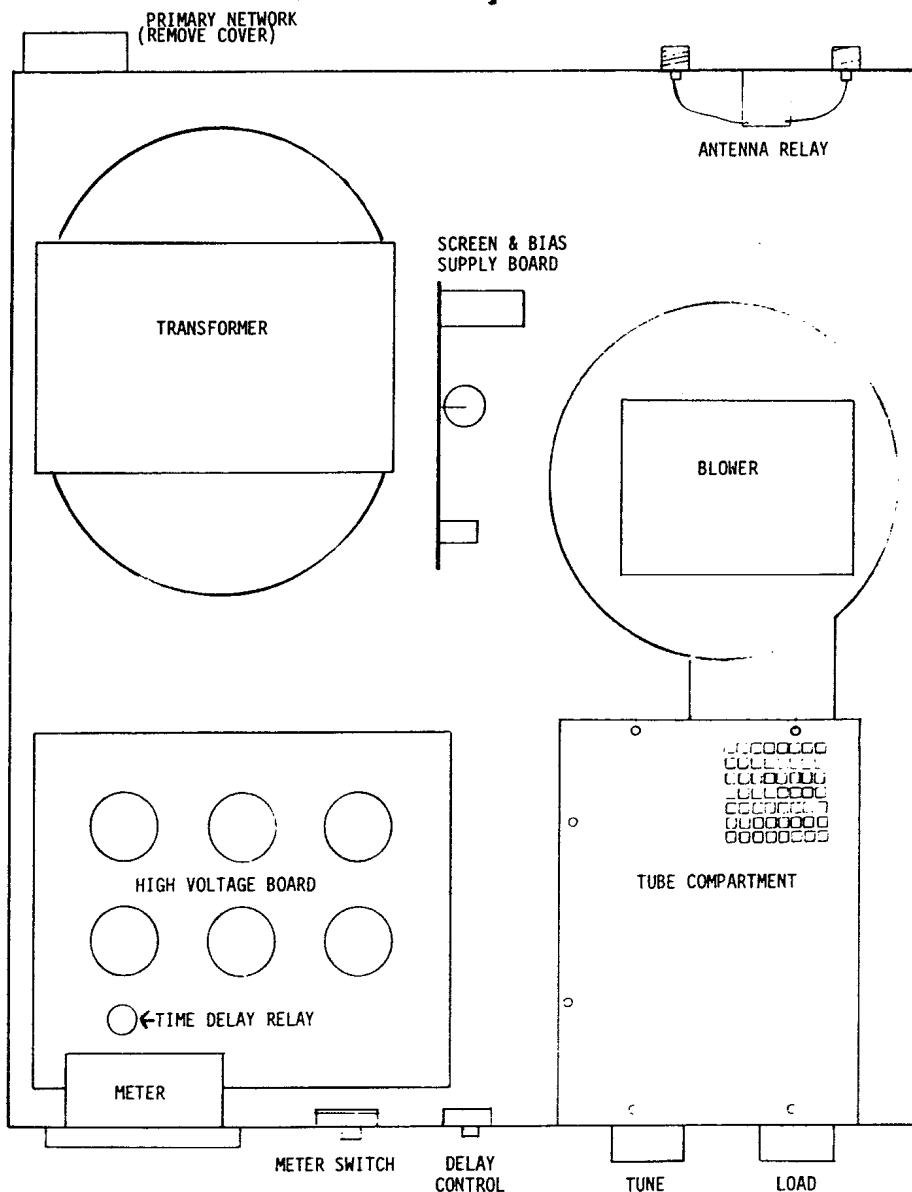
**Fuseholder** - Contains the fuse that protects the unit against damage due to internal failure.

\* note: A wattmeter is essential for proper tuning of the amplifier. (See Hook-Up Diagram)



# Amplifier Preparation

- (1) Using the allen wrench supplied remove the six (6) hex screws that hold the top cover on and remove the top cover.
- (2) Remove the cover from the tube compartment and remove packing material.
- (3) Check the plate circuit to make sure the plate choke and the tank coil are not touching the chassis. Also, make sure the output link (L2) is not touching the tank coil (L1).
- (4) Replace the tube compartment cover.
- (5) Replace the top cover and lightly tighten the cabinet screws.



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## **Unpacking Instructions**

Carefully remove your Clipperton V 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 V is not critical. Be certain, however, to leave enough room to allow for proper air flow over and under the unit.

## **Installation**

The Clipperton V 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 V 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. The Clipperton V will key when drive is applied to the amplifiers input jack. If hard wire keying is desired, connect the Clipperton V to your transmitter using shielded cable and the proper relay contact on the accessory jack.
4. Connect the RF input jack to the transmitter RF output using 50 ohm coax.
5. Connect as short a ground lead as possible from a good earth ground to the unit's rear panel GRD terminal.

# BIAS ADJUSTMENT

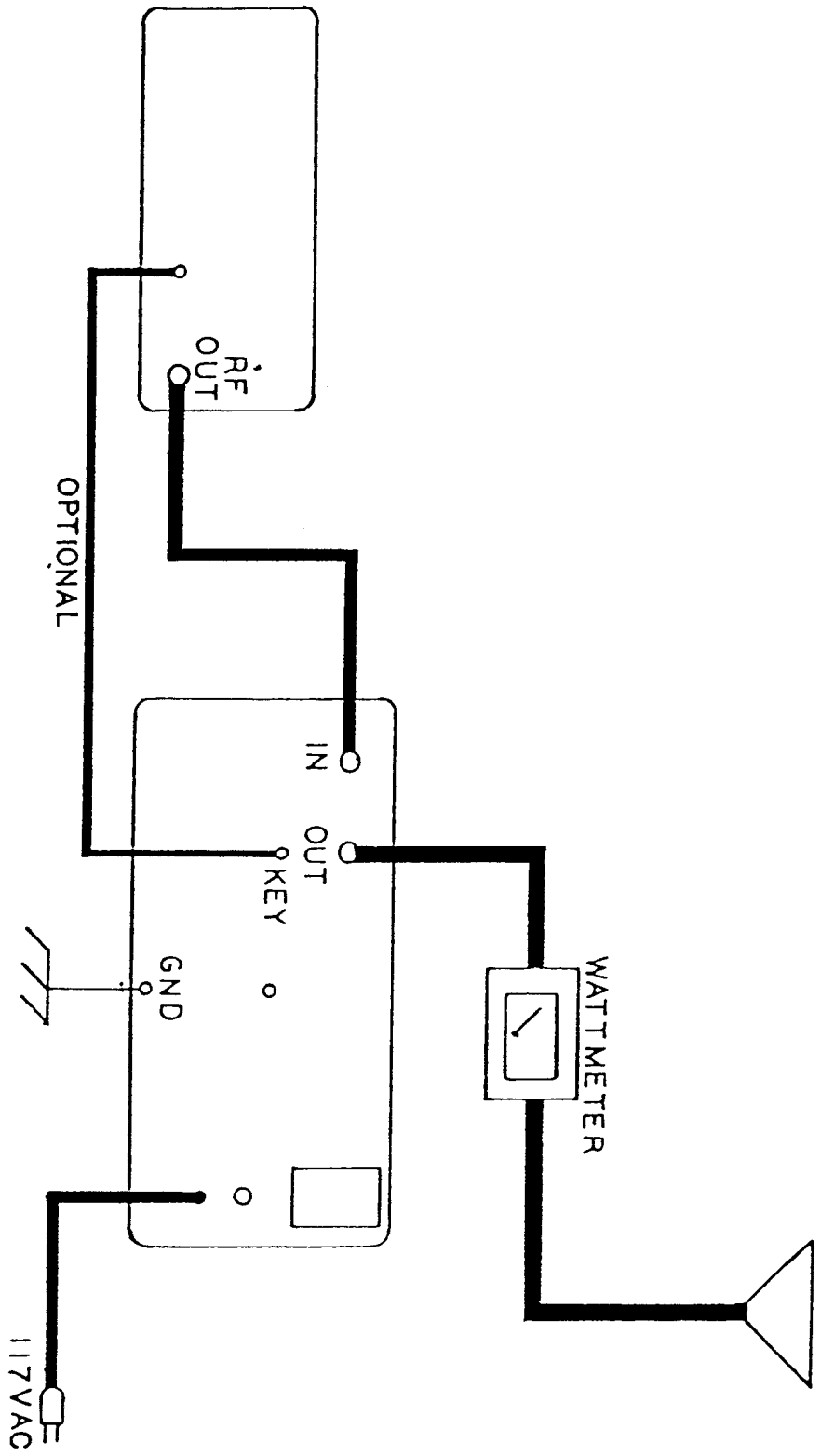
After the amplifier has been unpacked and set up on your operating bench, you will need to make sure the amplifier is properly biased. The quickest way to do this is to key the amplifier with no signal applied. The idling current should read 50 MA. This is set at the factory, adjust the bias control on the back panel for proper current reading.

**CAUTION:** Whenever the Clipperton V is keyed, there should be a 50 ohm load connected to the output connector.

## OPERATING PROCEDURES

(SSB, CW, FM, RTTY)

1. Position the Clipperton V front panel controls as follows:  
PWR - OFF  
STDBY/OPRTE - STDBY  
PLATE TUNE - DESIRED RANGE  
LOAD - MIDSCALE
2. Turn delay control for minimum.
3. Plug the amplifier into the appropriate outlet.
4. Turn power switch on and wait until power light comes on.
5. Turn the STDBY/OPRTE switch to operate.
6. Apply drive to the amplifier. The amplifier will key when drive is applied or by manual keying using the supplied key jack.
7. Quickly turn the tune control for maximum output as seen on an external RF watt meter.
8. Now turn the load control for not more than 250 MA plate current.
9. Repeat steps 7 & 8 for maximum output.
10. If SSB or CW is desired, it will be necessary to adjust the delay control so the relay will stay keyed during signal minimums. This is not necessary when hard wire keying is used.
11. If FM or RTTY is used, load the amplifier for no more than 250 MA plate current.



# HOO-K-UP DIAGRAM

APPROVED BY: \_\_\_\_\_

SCALE: \_\_\_\_\_

DATE: \_\_\_\_\_

DRAWN BY: BUD

REVISID

**Denton** RADIO CO.

CLIPPERTON - V

DRAWING NUMBER: 29-009

# CLIPPERTON V - PARTS LIST

## RESISTORS

R1 - R6, R13, R18	100K 2W
R7, R9	27K 2W
R8	47K 2W
R10 - R12	1 Meg 1W 1%
R14	470 ohm 2W
R15	100 ohm 2W
R16	100 ohm 10W
VR1	100K .5 ohm
VR2	1K .5 ohm

## CAPACITORS

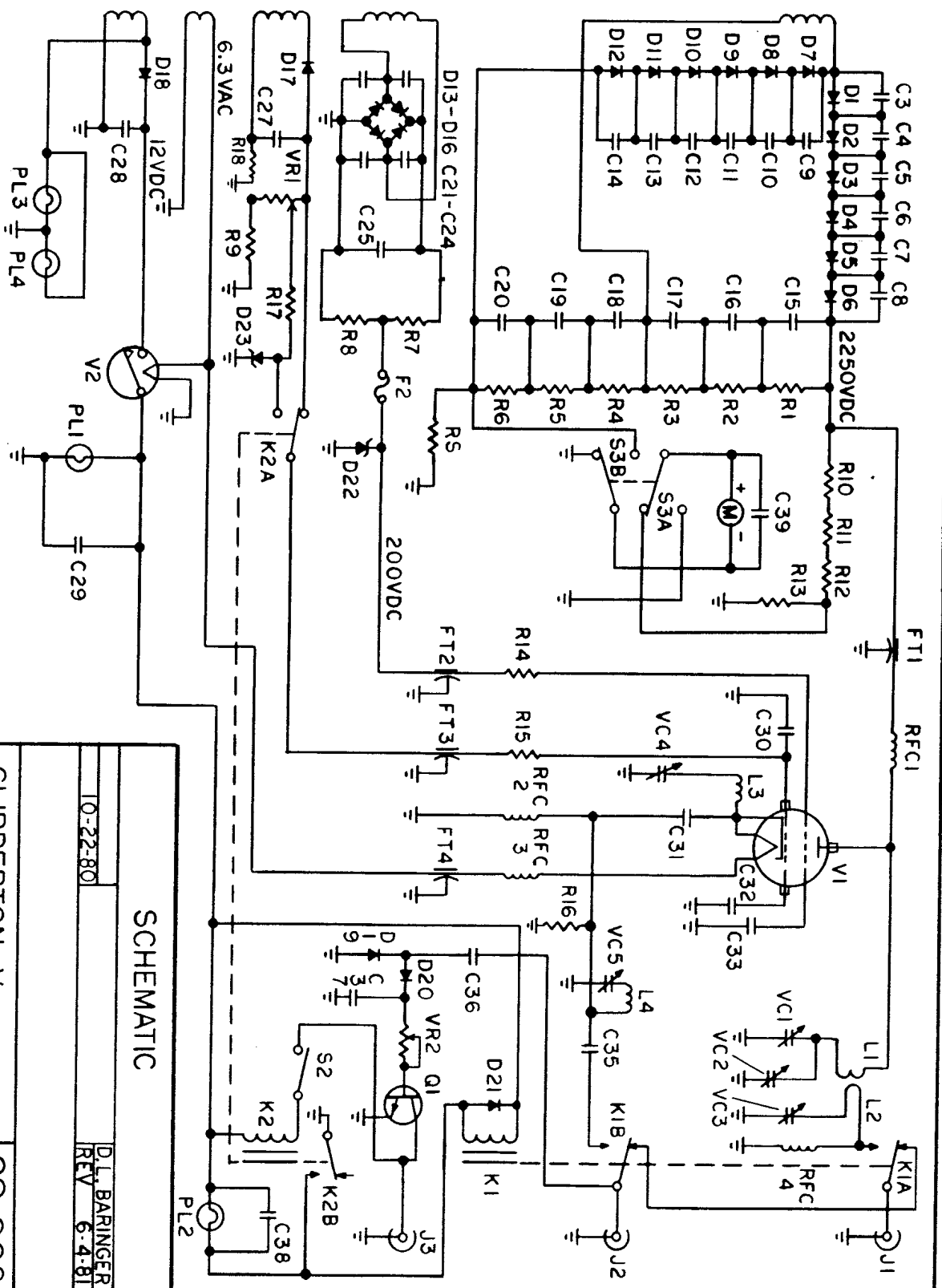
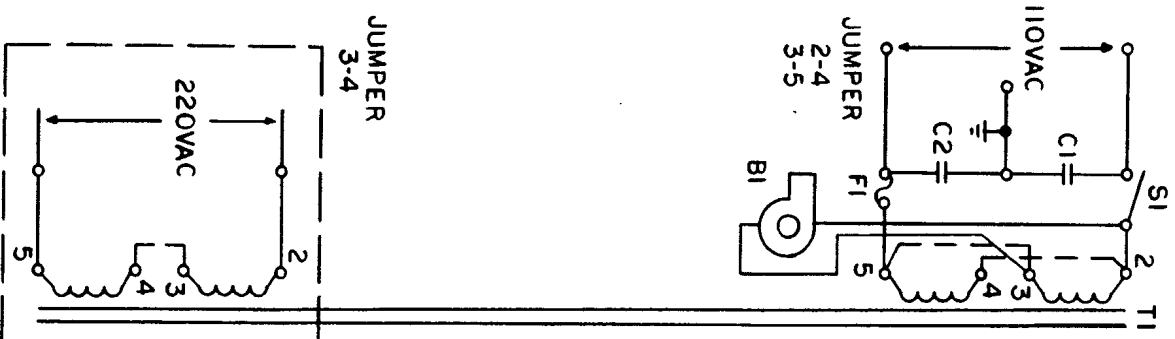
C1 - C14; C21 - C24	.01U 1KV
C30, C32	
C15 - C20, C25	100Uf 450V Elect.
C27	100Uf 150V Elect:
C28	600Uf 25V Elect.
C29, C38	.001Uf 1KV
C31	200Pf S.M.
C33	Part of Socket SK600
C35	12Pf S.M.
C36	5Pf S.M.
C37	500Uf 25V Elect.

## DIODES

D1 - D16	M4G5 or Equivalent
D17, D18, D21	1N4007
D19, D20	1N4148
Q <sub>1</sub>	2N2949

## MISCELLANEOUS

FT,1 - FT,4	.001Uf Feedthru Cap
RCF-1	Z144 Plate Choke
RFC-2, 3	Filament Choke
RFC-4	2.5Mh Choke
L <sub>1</sub>	Primary Tank Coil
L <sub>2</sub>	Output Link
L <sub>3</sub> , L <sub>4</sub>	Input Coil
S <sub>1</sub> , S <sub>2</sub>	SPST Switch
S <sub>3</sub>	DPDT Switch
VC <sub>1</sub>	24Pf Variable
VC <sub>2</sub> , VC <sub>3</sub>	8Pf Variable
VC <sub>4</sub> , VC <sub>5</sub>	1-8Pf Piston Trimmers
PL-1, PL-2	382 Lamp
PL-3, PL-4	386 Lamp
V <sub>1</sub>	4CX250B
V <sub>2</sub>	6N060T Delay Replay
K <sub>1</sub> , K <sub>2</sub>	DPDT Relay
T <sub>1</sub>	Power Transformer
B <sub>1</sub>	Blower



**SCHEMATIC**

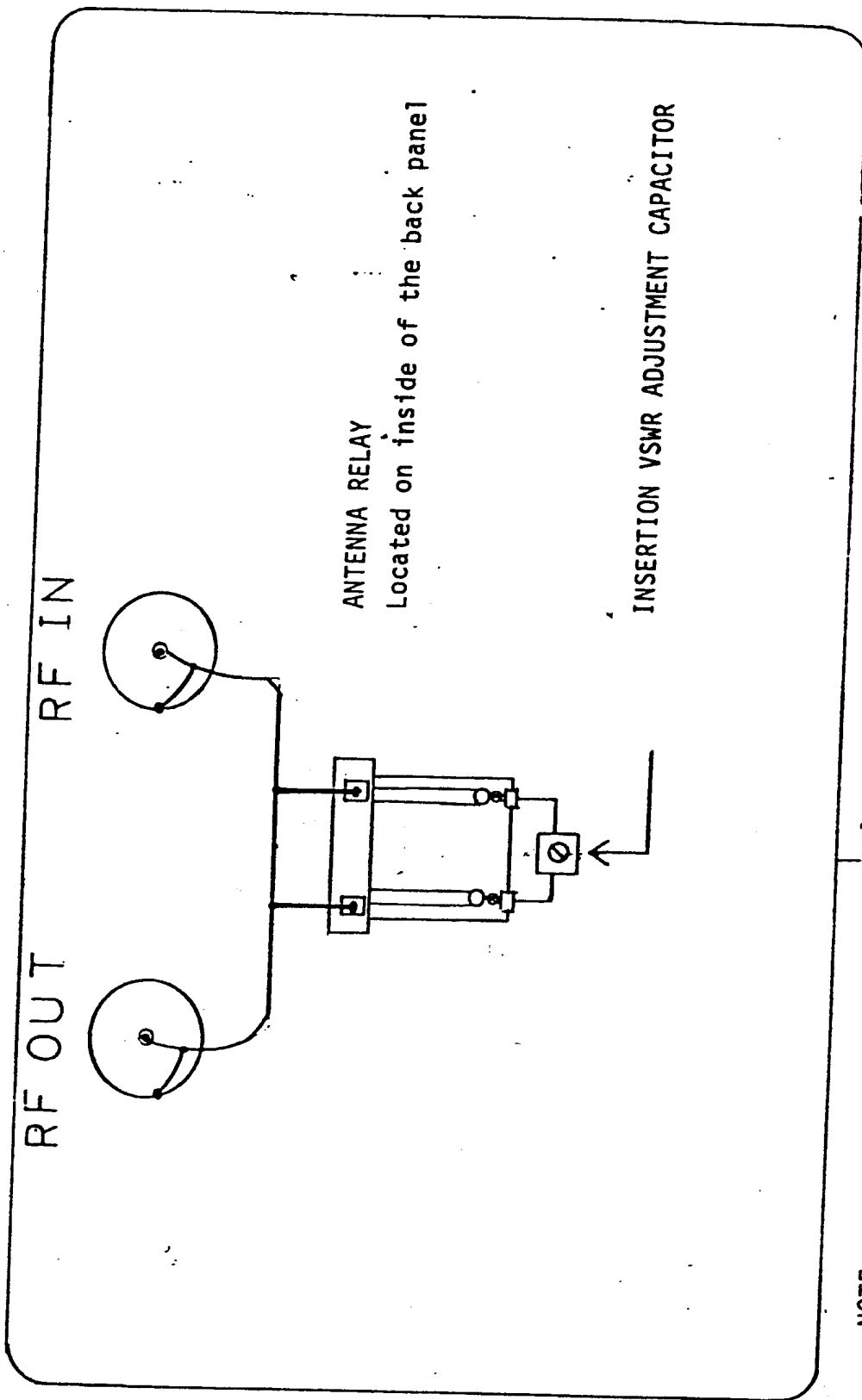
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REV. 6-4-81

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CLIPPERTON - V

29-008

CLIPPERTON-V OWNERS MANUAL INSERTION SHEET #1



NOTE:

Adjust the insertion VSWR capacitor, for minimum VSWR to your transceiver while the Clipperton-V is in the standby mode.  
This will be different in every application so, therefore, this adjustment cannot be factory set.

*Dentron*