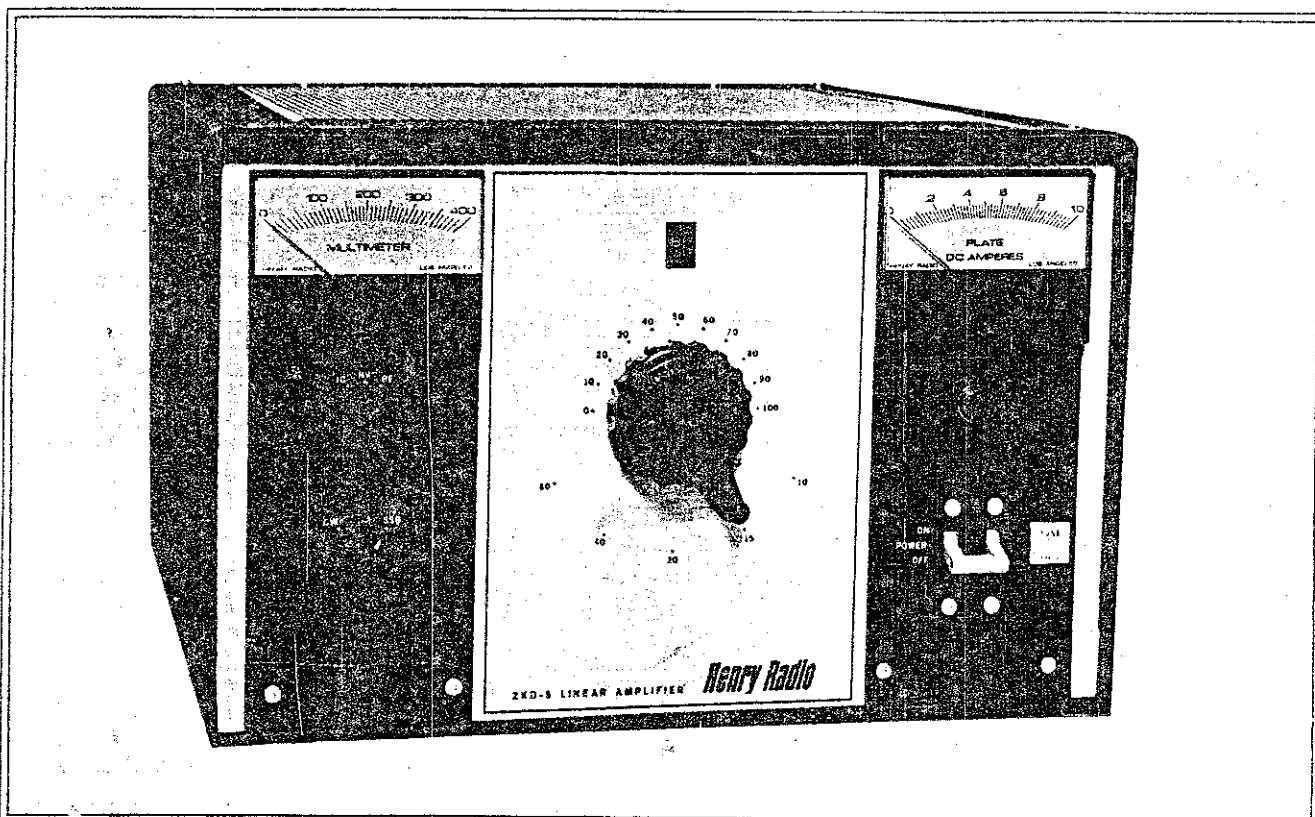


OPERATING AND MAINTENANCE MANUAL

HENRY 2KD-5



**Henry Radio**

11240 West Olympic Boulevard Los Angeles, California 90064

## HENRY 2KD-5 RF LINEAR POWER AMPLIFIER SPECIFICATIONS

<b>GENERAL INFORMATION</b>	Type and Function of Equipment:	The 2KD-5 is a 2000 watt PEP input (1200 watt PEP nominal output) RF linear amplifier, covering the 80, 40, 20, 15, and 10 meter amateur bands.	
	Tube Complement:	Two Eimac 3-500Z glass envelope triodes operating in a grounded grid circuit.	
	Duty Cycle:	Full output in intermittent amateur service.	
	Tube Cooling:	Forced air.	
	ALC Circuit:	ALC circuit to prevent overdrive from high power exciters, also boosts average talk power.	
	Type of Emission:	SSB, CW, RTTY, or AM.	
	Antenna Relay:	DC relay system for hum-free operation, requires shorting contact to ground during transmit to key amplifier into transmit.	
	Power Output Indicator:	Self-contained relative RF power meter.	
	Tank Circuit:	Pi-L plate circuit with a rotary silver plated tank coil for greatest efficiency and maximum attenuation of unwanted harmonics.	
	Input Circuits:	Cathode Pi input matching circuits for maximum drive and linearity.	
	Power Supply:	Conservative power supply with solid state rectifiers for reliable, long term operation.	
	<b>RF DATA</b>	Frequency Range:	80 meters 3.5 to 4.0 MHz 40 meters 7.0 to 7.5 MHz 20 meters 14.0 to 14.5 MHz 15 meters 21.0 to 21.5 MHz 10 meters 28.0 to 30.0 MHz*
		Input Power:	Full legal input in all modes. 2000 watts PEP input for SSB. 1000 watts DC input for CW, RTTY, and AM.
		Output Power:	1200 watts PEP nominal - SSB 600 watts DC nominal - CW and RTTY 350 watts nominal - AM.
Drive Power:		80 to 150 watts nominal, 100 watts for full output.	
Output Impedance:		52 ohms unbalanced with SWR not to exceed 2:1.	
Input Impedance:		52 ohms nominal.	
Harmonic and Spurious Radiation:		Second Harmonic - -40 db nominal Third Order Distortion - better than -30 db at full power output.	
Noise Level:		-40 db or better below one tone carrier at 1 KW.	
Line Voltage:		Jumper for 115 or 230 VAC, 3 wire single phase.	
Current Requirements:		15 amps (230 VAC) or 30 amps (115 VAC).	
<b>ELECTRICAL DATA</b>	Plate Voltage:	3000 VDC (SSB) and 2000 VDC (CW) nominal.	
	Protective Devices:	AC Mains circuit breaker, Cathode Fuse, Low Voltage fuse, High Voltage Cabinet Shorting Bar.	
	Dimensions:	10.5" high x 15" wide x 17.5" deep.	
<b>PHYSICAL DESCRIPTION</b>	Weight:	62 pounds.	
	Shipping Weight:	70 pounds.	
	Front Panel Controls:	On/Off Power Switch (Circuit Breaker), Multimeter, Multimeter Switch, SSB/CW Switch, Triconcentric Tune/Load/Band Control, Plate Current Meter, Pilot Light, and Cathode Fuse.	
	Rear Panel Controls:	ALC Jack, ALC Adjust Potentiometer, Relay Control Jack, BNC RF Input Connector, UHF RF Output Connector, Ground Lug, 1.5 Amp Low Voltage Fuse, 115/230 Terminal Board, 10' 3-wire Power Cord with no power plug.	
	Accessories Supplied:	Drive Cable, ALC Cable, Relay Cable, Manual.	
	Metering:	Relative RF Output, 0 to 4000 VDC Plate Voltage, 0 to 400 ma Grid Current, 0 to 1 amp Plate Current.	
	Cabinet:	All aluminum cabinet to eliminate magnetic resonance and double shielded to prevent RF interference.	
	Color:	Light grey wraparound, black trim, brushed aluminum front panel.	
	Manufacturer:	HENRY ELECTRONICS, Inc. 11240 West Olympic Blvd Los Angeles, California 90064	

\*Ten meter band coverage only available in units for Military, Commercial or Export. Not available for domestic use in the United States.

# HENRY 2KD-5 OPERATING AND MAINTENANCE MANUAL

## SECTION 1 INTRODUCTION

The 2KD-5 amplifier is a high-quality one-stage linear amplifier using two rugged, proven glass-envelope Eimac 3-500Z triodes operating in a grounded grid circuit. The equipment is completely self-contained, a table top, 2000 watt PEP input amplifier using only the highest quality components available. In the tradition of Henry amplifiers, the 2KD-5 is designed for complete linearity, and conservative operation, resulting in clean signals with no RF interference. The amplifier is designed for SSB, CW, RTTY, or AM operation on the amateur bands between 3.5 and 30 MHz. The amplifier can be factory modified for frequencies outside the amateur bands for commercial or military operation. The 2KD-5 comes factory wired for operation from a 230 VAC line but may easily be rewired for 115 VAC operation. Please read the operating instructions to familiarize yourself with the unit before attempting operation.

**CAUTION:** There are dangerously high voltages present inside the amplifier whenever the power switch is in the ON position. Do not remove the top cover without exercising the utmost caution!

## SECTION 2 INSTALLATION

### Section 2.1 UNPACKING

Remove the amplifier from its shipping carton and packing material and examine it carefully for visible damage. If the linear has been damaged in shipment, save the box and packing material and notify the transportation company immediately. It is a good idea to save the box in any case because the box is expensive to replace and will be useful in protecting the 2KD-5 should you ever decide to ship or move it to another location. The amplifier is shipped without the two tubes installed. Before operation, you must install the 3-500Z tubes as described in Section 2.3.

The following accessories should be included with the amplifier:

1	Instruction Manual	2	Shielded Control Cables
1	Warranty Card	5	3 AG, 1.5 Amp Fuses
1	PL-259 Coax Connector	5	8 AG, 1.5 Amp Fuses
1	RF Input Cable (RG-58)		

### Section 2.2 OPERATING LOCATION

The amplifier may be located wherever desired provided there is adequate air flow from the bottom of the unit up through the top. Do not enclose the amplifier or restrict the airflow. You will also require a location that has an appropriate power source. An operating location which avoids environmental extremes of heat, humidity, and dust will keep the amplifier new looking and guaranty years of reliable operation.

### Section 2.3 INSTALLATION OF TUBES

Remove the perforated top cover of the amplifier and the interior top shield, giving access to the interior of the RF section of the amplifier.

Put the two 3-500Z tubes in their sockets. Install the rear tube so that the screw which holds the plate strap is towards the front of the amplifier. Install the front tube so that the screw is towards the back of the amplifier. Be careful not to put any strain on the glass portion of the tubes. They are easily damaged. Fasten each plate lead to its appropriate anode connector. Remove the screw in the top of each anode connector on top of the tube and flex the parasitic choke and plate lead until the mounting hole in the plate is positioned directly above the screw hole in the anode connector. Insert the screw and hold the plate lead firmly while tightening the screw.

**CAUTION:** Do not exert too great a pressure or twist on the anode connector. Excessive pressure can cause a hairline fracture in the tube's glass envelope, destroying the tube. The tube's pins are also particularly delicate, and can easily break if the tube is not inserted and removed very carefully.

Replace the top shield but leave the outside cover off until the amplifier has been connected and tested. Be certain that the high voltage shorting strap on the RF section is not shorting after the top shield has been replaced.

## Section 2.4 CABLING

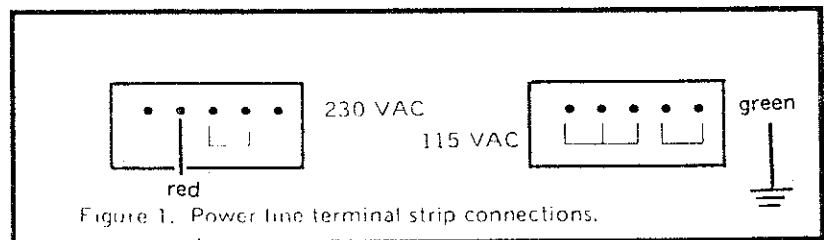
**NOTE:** Later 2KD-5's have a 4 wire power cable. See the schematic on page 14 for wiring instructions.

All of the following cables must be connected before operation of the amplifier.

**POWER CABLE** - The 2KD-5 comes from the factory wired for operation from a 230 VAC, single-phase, 60 Hz power source. The green wire in the power cord is the ground wire and must be connected to the neutral pin of the plug that you select for connection into the power line. The black and white wires must be connected to the other two pins for 230 VAC operation. Because there are several types of 230 VAC outlet sockets, a power plug has not been included with the amplifier. For 115 VAC operation, it is only necessary to change the jumper connections on the terminal strip behind the small door on the rear panel of the amplifier. Figure 1 shows the jumper connections for 115 and 230 VAC. Be sure that the jumpers are clear of the cover when the adjustment is complete to avoid any possibility of shorting the AC line to ground.

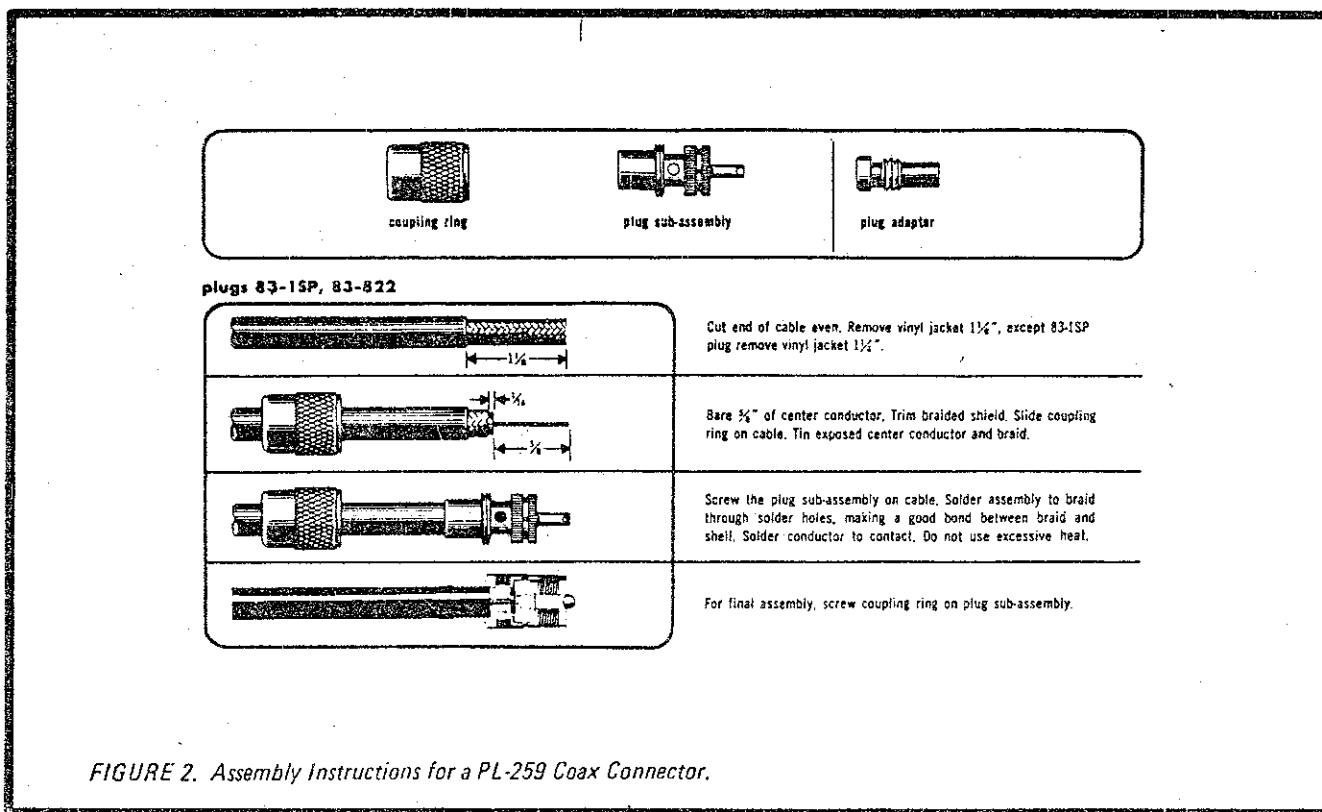
**CAUTION:** The amplifier will be damaged if the green wire is connected incorrectly. Be certain to disconnect the power cord from the AC line before changing the jumper terminals.

**ANTENNA COAX** - Use only RG-8/U coax (or its equivalent) to connect the 2KD-5 to the antenna. A PL-259, UHF type, coax connector is included in the accessory kit. Prepare the cable and connector as described in Figure 2. The PL-259 mates with the jack marked OUTPUT on the rear panel of the amplifier.



**CAUTION:** Do not operate the amplifier without a load or into a load with an SWR greater than 2:1. Measure the antenna's SWR with an SWR meter, using only the exciter, before operating the amplifier. With the 2KD-5 turned off, the exciter's output will pass through the amplifier directly to the antenna.

**DRIVE CABLE** - The RG-58A/U drive cable connects to the INPUT connector on the rear panel of the amplifier. This connector is the BNC jack. The other end of the cable is terminated by a PL-259 plug and should be inserted into the RF output connector of the exciter. An adapter may have to be used if the exciter does not have a matching socket.



ALC (Automatic Level Control) CABLE - Plug the gray ALC cable into the ALC OUT phono socket on the rear panel of the amplifier and into the ALC feedback connection on the exciter. If the exciter does not have provision for feedback of ALC voltage from the amplifier, simply ignore the amplifier's ALC socket and cable.

RELAY CABLE - The gray relay control cable should be plugged into the RCA phono socket marked RELAY CONTROL on the rear panel of the amplifier. This cable conducts the keying signal from the exciter to switch the amplifier to the transmit condition and should be plugged into the socket or connector marked antenna relay (or its equivalent) on the exciter. The exciter needs supply only a shorting relay contact (closed during transmit) to key the amplifier.

**CAUTION:** Do not apply any voltage to the RELAY CONTROL jack. The internal relay is activated by a self-contained power supply.

When the 2KD-5 is driven by an exciter without an antenna relay socket it may be necessary to examine the circuit diagram of the exciter to find an available unused relay contact that is normally open in the receive condition. All current transmitters and receivers designed for amateur operation have a relay contact at a terminal board or connector on the rear panel.

## SECTION 3 OPERATING CONTROLS

### Section 3.1 FRONT PANEL CONTROLS

OFF/ON POWER SWITCH - This switch is used for turning the amplifier on and off. It is also a circuit breaker for overload protection on the AC lines. When the 2KD-5 is turned off, the output of the exciter passes through the amplifier directly to the antenna.

MULTIMETER SWITCH - This 3-position rotary switch selects the function of the MULTIMETER as described below.

IG - With the switch in this position the meter monitors the amplifier's grid current. The full scale meter reading in this position is 400 ma DC. The nominal grid current during operation is approximately 100 to 125 ma.

HV - With the switch in this position, the meter monitors the amplifier's plate voltage. The full scale reading in this position is 4000 VDC. Normal plate voltage with the amplifier in stand-by (unkeyed) is about 3000 VDC for SSB operation and 2000 VDC for CW operation. Line voltage variations will cause corresponding variations in the plate voltage.

RF - With the switch in this position the meter monitors the relative RF output power of the amplifier. A full scale reading is about 1200 watts PEP output for SSB operation.

CW/SSB SWITCH - This 2-position rotary switch selects between two plate voltages to assure correct loading and output for each type of emission.

PLATE METER - This meter monitors the plate current of the 3-500Z tubes. Nominal plate current is between 650 and 800 ma for full output.

PILOT LIGHT - When the amplifier is turned on, the pilot light will come on indicating that the POWER switch is on.

CATHODE FUSE - This 8 AG, 1.5 amp fuse is the cathode fuse. Never use a higher amperage fuse than the one specified.

TRI-CENTRIC TUNE/LOAD/BAND CONTROL - This three function control has the three major operating controls as described below.

LOAD CONTROL - This control matches the amplifier's output network to the load. Refer to the calibration table for approximate initial settings for the frequency range desired. A LOAD setting of 0 corresponds to minimum loading and a LOAD setting of 100 corresponds to maximum load capacitor mesh.

TUNE CONTROL - The TUNE control is a 20-turn vernier dial connected to the variable inductance tank coil. The TUNE control reading can be used in conjunction with the setting given in the calibration table to adjust the tank coil for the approximate tuning range to be used. A vernier setting at maximum clockwise rotation (19.9) corresponds to the minimum tank coil inductance and the highest tank circuit frequency.

BAND SWITCH - The BAND switch selects the necessary input and output circuits for the amplifier to operate in any one of the following frequency ranges:

80	3.500 to 4.000 MHz
40	7.000 to 7.500 MHz
20	14.000 to 14.500 MHz
15	21.000 to 21.500 MHz
10	28.000 to 30.000 MHz (Export and military sales only)

The amplifier can be operated on many frequencies outside these bands by switching the amplifier to the band closest in frequency to the desired operating frequency. Never move the BAND switch when the amplifier is keyed.

## Section 3.2 REAR PANEL CONTROLS

**ALC JACK** - This socket accepts an RCA phono plug (an ALC cable is provided in the accessory packet of the amplifier). The ALC feedback to the exciter is available at this socket.

**ALC ADJUST POTENTIOMETER** - This potentiometer controls the sensitivity of the 2KD-5's ALC circuit. Refer to the operating instructions for the adjustment procedure

**RELAY CONTROL JACK** - The RELAY CONTROL jack accepts an RCA phono plug (a relay cable is provided in the accessory packet of the amplifier). When the socket is shorted to ground the amplifier's antenna relay closes. If the amplifier is turned off the relay will not key. Never apply any voltage to this socket.

**RF INPUT CONNECTOR** - This BNC coax connector accepts the drive line from the exciter. The input impedance of the amplifier is 50 ohms.

**RF OUTPUT CONNECTOR** - The nominal output impedance of the amplifier is 50 ohms. Do not operate the equipment without a load, or into a load with an SWR of more than 2:1. Use only RG-8/U coax (or its equivalent) to connect this SO-239 connector to an appropriate antenna or dummy load.

**GROUND LUG** - This lug is provided to ground the amplifier. Connecting the amplifier to a standard 3 pin electrical system is usually adequate grounding. If such a system is not used it is wise to ground the unit using the ground lug and connecting to a good earth ground to prevent radiated interference or the danger of electrical shocks.

**LOW VOLTAGE FUSE** - This 3 AG, 1.5 amp fuse protects the low voltage relay circuit from shorts. Never exceed the recommended current rating when replacing the fuse.

**AC POWER CONNECTOR TERMINAL BOARD** - This terminal board is used to adjust the power transformer taps for 110 or 220 VAC operation. Figure 1 describes the necessary jumpers for each type of operation.

**POWER CORD** - The power cord must be connected to an appropriate power source. No power plug is provided. Be certain that the power transformer is jumpered correctly for the appropriate line voltage.

## SECTION 4 OPERATION

### Section 4.1 PRELIMINARY SETTINGS

Set the band switch to the desired band. With the amplifier turned off, tune your exciter to the desired operating frequency, and then turn the exciter's drive to zero. Set the TUNE and LOAD controls to the calibration readings recommended in the calibration table for the desired operating band. With the amplifier off, its internal relay automatically connects the exciter directly to the antenna transmission drive.

Turn the 2KD-5 on by switching the circuit breaker to the ON position. The dial lights and pilot light should be lighted and the blower should be operating. Look down through the top shield to verify that the filaments of the 3-500Z tubes are lighted and place your hand directly above each tube to make certain air is circulating in the cooling system. The 3-500Z tubes require no warm-up period.

Set the multimeter switch to the HV position. The multimeter should read between 280 and 320, indicating a plate voltage of 2800 to 3200 VDC. With normal line voltage and no RF drive applied, the plate meter should show a resting current between 150 and 200 ma.

NOTE: the 3-500Z tubes should show color, glowing a dull cherry red with 400 ma of plate current, and possibly a bright orange at 800 ma. When so operated, the tubes are well within their rated operating limits and no damage will result, provided the plate current has been dipped to a minimum reading using the TUNE control. Do not operate the tubes with 800 ma current in an off resonance condition, and do not operate the tubes with 400 ma for long periods of time in an off resonance condition. Depending on the line voltage, the plate current will be between 650 and 800 ma for 1000 watts output.

#### Section 4.2 SSB OPERATION

Set the CW/SSB switch to CW and the multimeter switch to RF. With the exciter adjusted for zero output, press the PTT switch of the exciter, causing the exciter and the 2KD-5 to be keyed into the transmit mode. The amplifier's plate current meter should show a resting plate current between 150 and 200 ma. Increase the RF output of the exciter until the amplifier's plate current is about 400 ma. Adjust the TUNE control for maximum RF output as indicated on the multimeter. Turn the multimeter switch to IG and adjust the exciter's drive for an amplifier grid current between 260 and 270 ma.

- Step 1 If the plate current is less than 600 ma, increase the loading of the amplifier slightly by moving the LOAD control to a higher number. If the plate current is more than 600 ma decrease the loading by moving the LOAD control to a lower number.
- Step 2 Adjust the amplifier for a minimum plate current reading using the TUNE control.
- Step 3 Adjust the exciter's drive for a grid current reading between 260 and 270 ma.

Repeat steps 1 through 3 until the following operating parameters are reached:

- IG - 260 to 270 ma
- IP - 600 ma
- TUNE - TUNE control adjusted for minimum plate current.

Release the PTT switch of the exciter to allow the exciter and amplifier to go into the standby mode and turn the SSB/CW switch to the SSB position. Key the exciter and adjust it for an grid current reading between 260 and 270 ma on the amplifier. The plate current should be approximately 800 ma. If it is not, readjust the TUNE and LOAD controls.

Place the exciter into the SSB mode and adjust the exciter's microphone gain control for voice peak readings of about 400 ma on the amplifier's plate current meter. The grid current will peak between 50 and 100 ma. Check for proper drive with a monitor scope if one is available.

#### Section 4.3 CW OPERATION

Set the CW/SSB switch to CW and tune the amplifier as described in Section 4.2 substituting the following operating parameters:

- IG - 250 to 270 ma
- IP - 500 to 550 ma

The above plate current readings described in Section 4.2 and 4.3 apply for operation from a 230 VAC primary supply. For operation from a 115 VAC source, the plate current may have to be reduced because of poorer voltage regulation.



## Section 4.4 ALC ADJUSTMENT

The amplifier is shipped with the ALC ADJUST potentiometer fully counter-clockwise (off). If the ALC feedback feature is not desired, just leave the potentiometer as it comes from the factory. If ALC feedback is used, the adjustment need be made only once unless a new exciter is used. After the ALC adjustment is made, use the locknut on the potentiometer shaft to lock the control in place.

With the ALC ADJUST control fully counter-clockwise, tune the amplifier for SSB operation. Drive the amplifier to about 800 ma. of plate current and then rotate the ALC ADJUST control clockwise until the grid current just begins to decrease. If the exciter cannot drive the 2KD-5 to 800 ma. of plate current, leave the ALC ADJUST potentiometer in the fully counter-clockwise position.

The ALC circuit will prevent overdrive from high powered exciters when it is adjusted properly. For the cleanest, sharpest signals, avoid driving the plate current above 400 ma. on voice peaks.

## Section 4.5 ALTERNATE TUNING METHOD

When the TUNE and LOAD dial calibrations have been verified for each band, and the operator feels comfortable with the amplifier, the entire tuning procedure can be completed in a few seconds.

This alternate method (tuning for maximum output) is done by applying RF drive from the exciter to the amplifier, and then bringing the RF reading of the multimeter up to about two-thirds of full scale. Then adjust the TUNE and LOAD controls to peak the amplifier output reading as indicated on the multimeter. The amplifier will now be tuned to resonance for proper operation.

# SECTION 5. MAINTENANCE

## Section 5.1 PANEL METER CALIBRATION

Remove the top covers of the amplifier. Pull the shorting plug from the grid meter test point which is located on the small panel on the front of the RF section behind the front panel. Connect an external meter with a full scale reading of 500 or 1000 ma to the test point with the positive terminal on the center pin.

Operate the amplifier in a normal manner, loaded to the antenna or a dummy load. Adjust the grid meter potentiometer (the one nearest the test point) until the amplifier meter reads the same value as the test meter. After removing the test meter, reinstall the shorting plug.

Remove the high voltage lead from the back of the RF deck and connect a 1000 ma test meter in series with the lead. CAUTION: THE HIGH VOLTAGE IS LETHAL. EXERCISE EXTREME CAUTION! Operate the amplifier and adjust the plate meter potentiometer (the one nearest the plate meter) until the amplifier's meter and the test meter read the same value. Turn the amplifier off and allow several minutes for the voltage to bleed off. Reconnect the HV lead.

Connect a 5000 VDC voltmeter from one of the tube caps to chassis ground. CAUTION: THE HIGH VOLTAGE IS LETHAL. EXERCISE EXTREME CAUTION! Turn the amplifier on, but do not drive it. Allow a minute for warm up time. Adjust the center potentiometer until the amplifier's high voltage reading matches the test meter. Turn off the power and allow the high voltage to bleed off. Remove the test meter and replace the top covers.

TABLE 1. TROUBLESHOOTING

PROBLEM	CAUSE	REPAIR
The amplifier does not come on when the selector switch is turned on.	Improperly Connected AC line. The fuse is blown. The overload relay is shorted.  The power switch is not closing. The interlock switch is open.	Reconnect the line properly. Replace the fuse. Check the Relay with an ohm-meter. Check it with an ohm meter. Check it with an ohm meter.
The amplifier turns on as soon as the cable is plugged in and will not turn off.	The switch is shorted or inoperative.	Replace the switch.
There is no high voltage indication on the multimeter.	The meter circuit is inoperative.	Check the circuit for malfunction.
No plate current indicated when the amplifier is on and the exciter is transmitting with no RF Drive applied.	The relay control cable from the exciter to the 2KD-5 may be bad. RY may not be operating. If the exciter operates RY, suspect a poor contact by the center pole of the relay.	Check the cable's continuity.  Check for component malfunction. Burnish it and bend the relay center arm slightly to increase the closed pressure.
The plate meter shows current as soon as the high voltage is turned on and the exciter is not transmitting.	RY is probably actuating, showing a resting current of 150-100ma on the plate meter, caused by a short in the relay control circuit. If RY is not actuated, suspect a grid-filament short in one tube.	Unplug the relay control cable, if RY stays actuated the trouble is not in the exciter. Check the relay circuit. Replace the tube.
Excessive plate current.	Bad tube or bad R18. If one tube fails, it must be replaced before the 2KD-5 will operate. The filaments are operated in series, resulting in a total filament supply of 10 volts at 15 amps, dividing to 5 volts at 15 amps at each tube.	Replace the tube. Replace R18.
The 2KD-5 operates normally but no plate current shows.	Bad meter circuit.	Check the meter circuit for any malfunction.
An arc indicates a high voltage short: Unplug the high voltage plug from the RF deck and exciter. If the short persists it is located in the power supply.  If the short is in the RF deck.	A power supply high voltage short.  An RF deck high voltage short.	Check for visible evidence, an arc usually chars or blackens an area. Make an ohm meter check. Start with the filter condenser and check through the circuit toward the power transformer. Check interconnecting leads for a ground short. Check the reverse resistance of D1-D2. When disconnected, good diodes have infinite resistance and bad diodes read less than 2 ohms resistance in either direction. Check for visible evidence. Make an ohm meter check. Check the high voltage leads.
The circuit breaker is actuated by a short.	Shorted power transformer primary. A shorted rectifier diode.	Check for a short and replace. Check with an ohm meter as above and replace.
No plate current and excessive grid current.	Open high voltage circuit.	Examine the circuit and repair.
No grid current and the plate meter does not drive up.  Intermittant grid current.  Low grid current.	Exciter malfunction.  Cable between exciter and 2KD-5 bad. Bad socket connection in that cable. Bad input module.  Low output from the exciter.	Turn the 2KD-5 off, switch to FWD PWR, operate exciter to antenna and check its operation. Check cable continuity. Repair the socket connection. Operate on a different band to isolate the problem. Check the exciter output.

## HENRY 2KD-5 PARTS LIST

SCHEMATIC NO.	DESCRIPTION	MANUFACTURER OR EQUIVALENT
B1	BLOWER: 110 VAC.	Howard 3-90-8506
.01	CAPACITOR: Ceramic Disc, .01 mf, 600 Volt.	Centralab DD6-103
C1-C8	CAPACITOR: Electrolytic, 190 mf, 450 VDC.	CDE FAH 190-450A3
C9	CAPACITOR: Electrolytic, 500 mf, 25 VDC.	Arco MEJ-500
C10, C11	CAPACITOR: Ceramic disc, .001 mf, 6KV.	Centralab DD60-102
C12	CAPACITOR: Ceramic disc, .0047 mf, 6KV.	Sprague 60GA-D47
C13, C14	CAPACITOR: Ceramic transmitting, 1000 pf, 5,000 VDC.	Centralab 858S-1000
C15, C16	CAPACITOR: Ceramic transmitting, 25 pf, 5,000 VDC.	Centralab 850S-25Z
C17, C18, C19	CAPACITOR: Ceramic transmitting, 75 pf, 5,000 VDC.	Centralab 850S-75N
C20A	CAPACITOR: Ceramic transmitting, 300 pf, 5,000 VDC,	Centralab 858S-100x3
C20B	CAPACITOR: Ceramic transmitting, 300 pf, 5000 VDC, bank of 3 capacitors.	Centralab 858S-100x3
C21	CAPACITOR: Variable, air, 19 to 488 pf, 2 KV,	All Star 73-1-45-45
C22	CAPACITOR: Mica, 220 pf, 500 VDC.	Arco DM15-221J
C23, C24	CAPACITOR: Mica, 47 pf, 500 VDC.	Arco DM15-470J
C25, C26	CAPACITOR: Ceramic disc, .1 mf, 1KV.	Centralab CK-104
C27, C28	CAPACITOR: Ceramic disc, .003 mf, 50VDC.	Centralab DD-302
C29 (Delete in U.S.A.)	CAPACITOR: Mica, 82 pf, 500 VDC.	Arco DM15-820J
C30 (Delete in U.S.A.)	CAPACITOR: Mica, 75 pf, 500 VDC.	Arco DM15-750J
C31, C32 (Delete in U.S.A.)	CAPACITOR: Mica, 68 pf, 500 VDC.	Arco DM15-680J
C33, C34	CAPACITOR: Mica, 100 pf, 500 VDC.	Arco DM15-101J
C35, C36	CAPACITOR: Mica, 91 pf, 500 VDC.	Arco DM15-910J
C37-C40	CAPACITOR: Mica, 160 pf, 500 VDC.	Arco DM15-161J
C41	CAPACITOR: Mica, 210 pf, 500 VDC.	Arco DM15-211J
C42, C43	CAPACITOR: Mica, 330 pf, 500 VDC.	Arco DM15-331J
C44, C45	CAPACITOR: Mica, 300 pf, 500 VDC.	Arco DM15-300J
C46	CAPACITOR: Mica, 390 pf, 500 VDC.	Arco DM15-390J
C47 - C49	CAPACITOR: Mica, 470 pf, 500 VDC.	Arco DM15-471J
C50, C51	CAPACITOR: Mica, 820 pf, 500 VDC.	Arco DM15-821J
C52	CAPACITOR: Mica, 620 pf, 500 VDC.	Arco DM15-621J
C53 - C57	CAPACITOR: Ceramic feedthrough, 2,000 pf, 600 VDC.	Erie 202M
CB	CIRCUIT BREAKER: 20 amp.	Wood W68X2Q1-2-20
D1, D2	DIODE: Silicon rectifier, 15 KV, 1.2 amps.	Semtech SDHD-15K
D3	DIODE: Zener, 100 volts, 12 ma., 5 watt.	Motorola HEP-Z2545
D4, D5	DIODE: Rectifier, axial lead, 1,000 PIV, 1 amp.	SCI XCSTN-142
D6	DIODE: Silicon rectifier, axial lead, 200 PIV, 1 amp.	1N453
D7	DIODE: Zener, 10 Volts, 1.2 amps.	Semtech SA-5534
D8 through D11	DIODE: Silicon rectifier, axial lead, 1,000 PIV, 1 amp.	GE-509
D12	DIODE: Silicon rectifier, axial lead, 50 PIV, 1 amp.	GE 1N82A
F1	FUSE: 3AG, 1.5 amp, 250 VAC.	Littelfuse 312-1.5
F2	FUSEHOLDER.	Littelfuse 342-004
F3	FUSE: 8AG, 1.5 amp, 250 VAC.	Littelfuse 361-1.5
F4	FUSEHOLDER.	Littelfuse 348-875
HV	CONNECTOR: High voltage plug and socket.	Millen 37501
J1, J2	CONNECTOR: Filament pin jack and socket.	Smith 101 and 102
J3	CONNECTOR: Grid current test jack.	Switchcraft 3501 FP
J4, J5	CONNECTOR: ALC and relay control, chassis jack, RCA phone type.	Switchcraft 3501FP
J6	CONNECTOR: RF OUT, coax chassis connector, type SO-239, UHF.	Amphenol 83-1R
J7	CONNECTOR: RF IN, coax chassis connector, type UG-209 A/U, BNC.	Amphenol 31-203
L1	INDUCTOR: RF Plate Choke, 106 turns on a teflon rod (20 guage wire).	Henry L1-2KD-5
L2	INDUCTOR: 24 MHz Tank Coil.	Henry L2-2KD-5
L3	INDUCTOR: Tune control, variable,	Henry L3-2KD-5
L4	INDUCTOR: Tank coil.	Icore 1608-22

## HENRY 2KD-5 PARTS LIST (Continued)

SCHEMATIC NO.	DESCRIPTION	MANUFACTURER OR EQUIVALENT
L5	INDUCTOR: RF choke, 2.5 mh, 150 ma.	Miller 4555
L6	INDUCTOR: RF choke, 5 turns no. 16 copper wire.	Henry L6-2KD-5
L7 (Delete in U.S.A.)	INDUCTOR: 10 Meter, input coil, 5 turns no. 18 copper wire.	Henry L7-2KD-5
L8	INDUCTOR: 15 Meter input coil, 6 turns no. 18 copper wire.	Henry L8-2KD-5
L9	INDUCTOR: 20 Meter input coil, 8 turns no. 18 copper wire.	Henry L9-2KD-5
L10	INDUCTOR: 40 Meter input coil, 10 turns no 18 copper wire.	Henry L10-2KD-5
L11	INDUCTOR: 80 Meter input coil, 14 turns no. 18 copper wire.	Henry L11-2KD-5
L12	INDUCTOR: RF choke, 2.5 mh, 160 ma.	Miller 6302
L13	INDUCTOR: Filament center tap choke.	Henry L13-2KD-5
L14, L15	INDUCTOR: Parasitic suppressor, copper strap and 2 only 150 ohm resistors.	Henry L14-2KD-5
L16	INDUCTOR: Toroid wound filament choke.	Henry L16-2KD-5
M1	METER: Plate meter, 0-1 amp. scale.	Beede 913104
M2	METER: Multimeter, 0-400 ma. scale.	Beede 913105
P1	CONNECTOR: 11 pin plug.	Amphenol 86CP11
P2	CONNECTOR: 9 pin plug.	Cannon DE-9P
PL1	LIGHT: 6S6 pilot light.	6S6
PL2	LIGHT: Pilot light assembly.	IDI B-1050-C1
R1 through R8	RESISTOR: Wire wound, 20 K ohm, 20 watt, 5%.	Memcore FR20-20K
R9	RESISTOR: Wire wound, 200 ohm, 20 watt, 5%.	Memcore FR20-200
R10	RESISTOR: Wire wound, 22.5 K ohm, 10 watt, 5%.	Memcore FR10-22.5K
R11	RESISTOR: Carbon, 150 ohm, 2 watt, 10%.	Resistor
R12	RESISTOR: Carbon, 10 K ohm, 2 watt, 10%.	Resistor
R13	RESISTOR: Carbon, 1.8 K ohm, 1/2 watt, 10%.	Resistor
R14	RESISTOR: Carbon, 1 K ohm, 1/2 watt, 5%.	Resistor
R15	RESISTOR: Carbon, 68 K ohm, 1 watt, 10%.	Resistor
R16	RESISTOR: Carbon, 1 K ohm, 1 watt, 10%.	Resistor
R17	RESISTOR: Carbon, 220 ohm, 2 watt, 10%.	Resistor
R18	RESISTOR: Wire wound, 10 K ohm, 10 watt, 5%.	Memcore FR10-10K
R19	RESISTOR: Wire wound, 1/2 ohm, 10 watt, 5%.	Memcore FR10-0.5
R20	RESISTOR: Carbon, 270 K ohm, 2 watt, 10%.	Resistor
R21	RESISTOR: Wire wound, 2 ohm, 25 watt, 5%.	Memcore FR25-2
RY	RELAY: 3PDT, 12 VDC, 10 amp., antenna relay.	Magnacraft 151X-16
S1	SWITCH: SSB/CW.	Henry S1-2KD-5
S2	SWITCH: High voltage shorting.	Henry S2-2KD-5
S3	SWITCH: Multimeter, 4-position.	Centralab PA-1003
S4A, S4B	SWITCH: Band Switch, input section.	Centralab 2504
S5	SWITCH: Band Switch.	Centralab P-270
S6, S7	SWITCH: Band Switch.	Centralab P-284
SK1	CONNECTOR: 11 pin socket.	Amphenol 78PF11
SK2	CONNECTOR: 9 pin socket.	Cannon DE-9S
T1	TRANSFORMER: Power.	ECA-1120
T2	TRANSFORMER: Relay.	Signal 241-6-24
TB1	TERMINAL BOARD: AC input.	Cinch 5-142
V1, V2	ELECTRON TUBE: 3-500Z high mu power triode. TUBE SOCKET: 5-pin Ceramic.	Eimac 3-500Z Johnson 122-0275
VR1	POTENTIOMETER: ALC adjust, 100 K ohm.	
VR2	POTENTIOMETER: HV Metering adjust, 500 K ohm.	
VR3	POTENTIOMETER: Grid Current metering adjust, 1,000 ohm.	
VR4	POTENTIOMETER: Plate Current metering adjust, 1,000 ohm.	

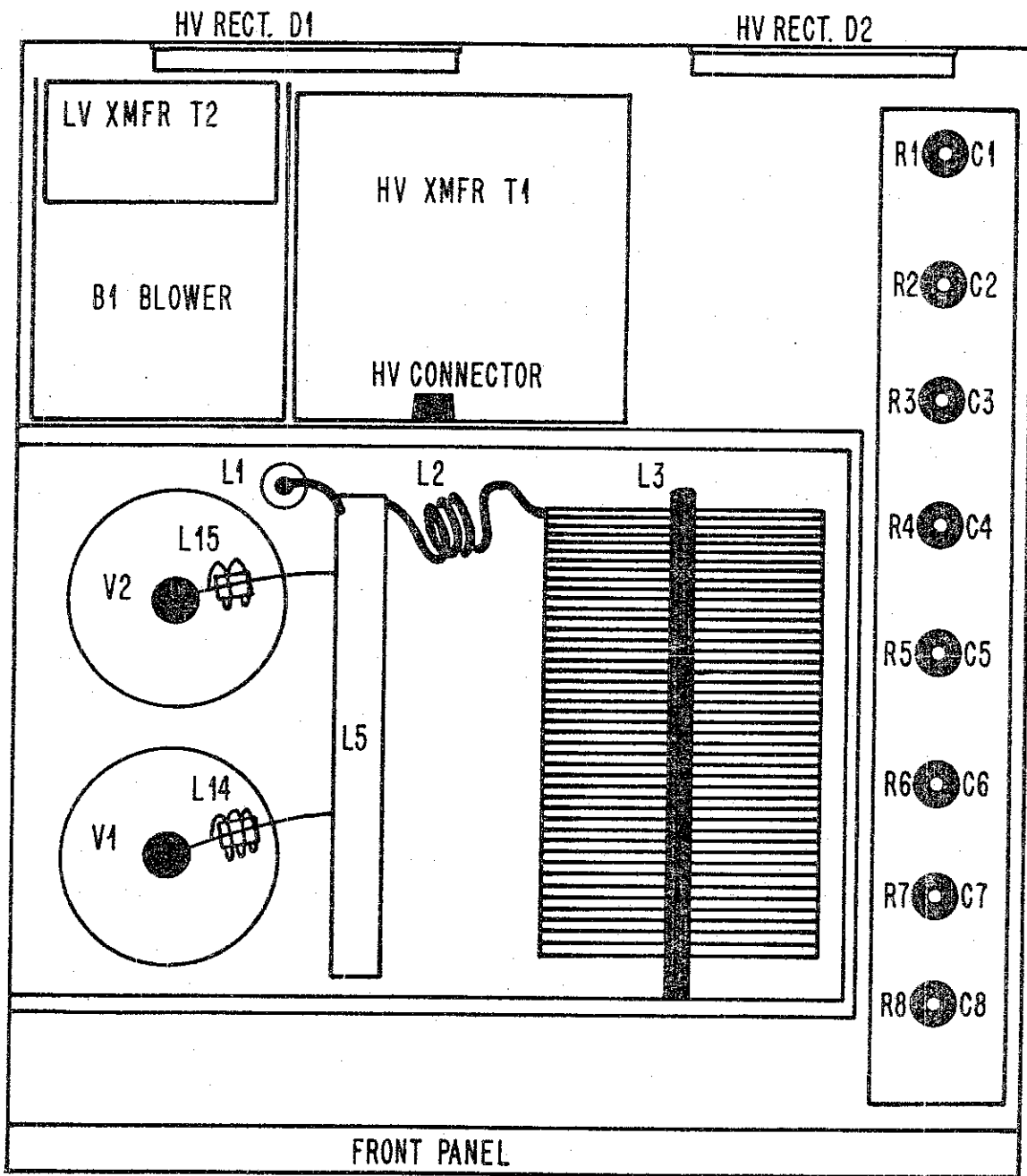
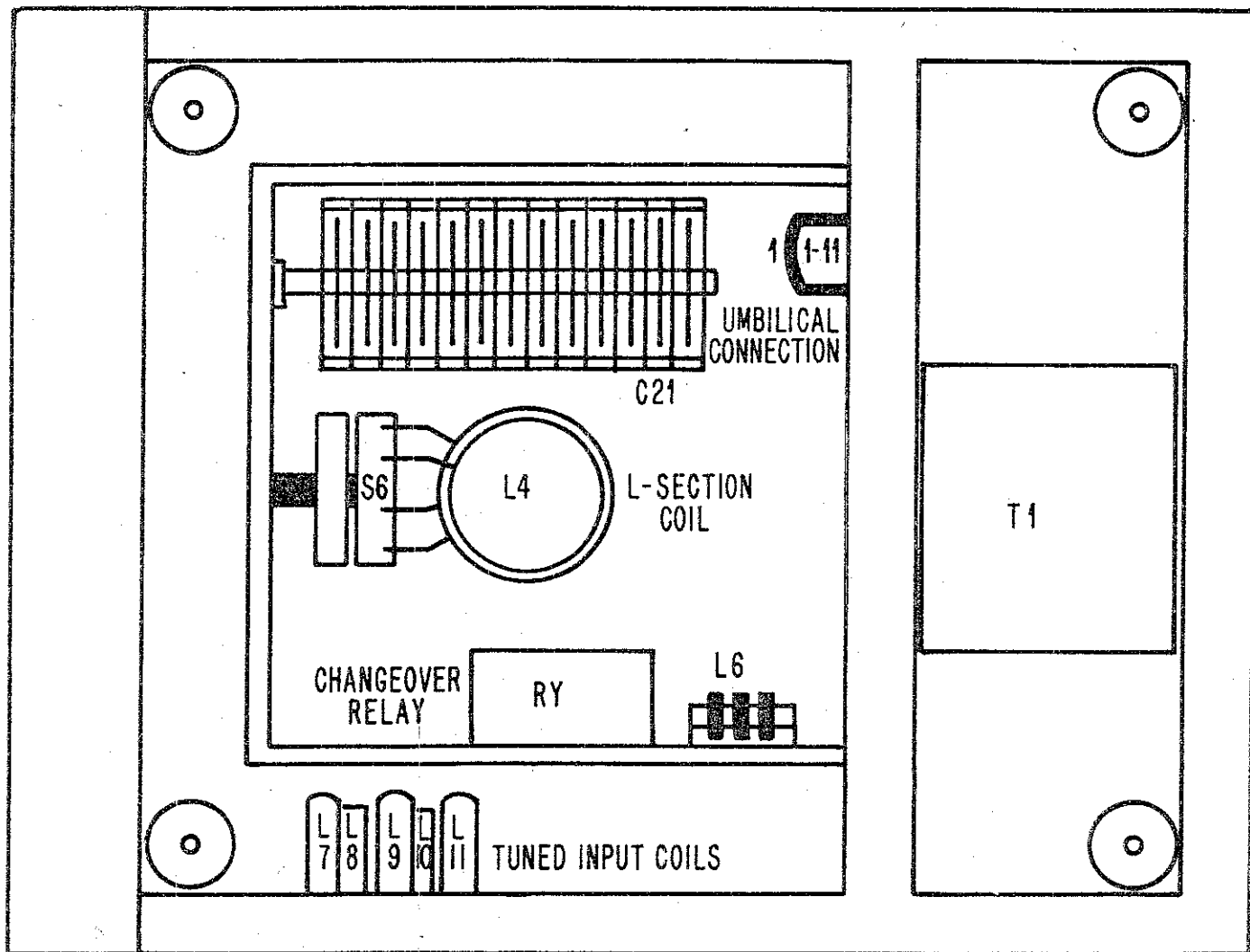


Figure 3. 2KD-5 Top View.



TUNED INPUT COILS - BOTTOM VIEW

Figure 4. 2KD-5 Bottom View.

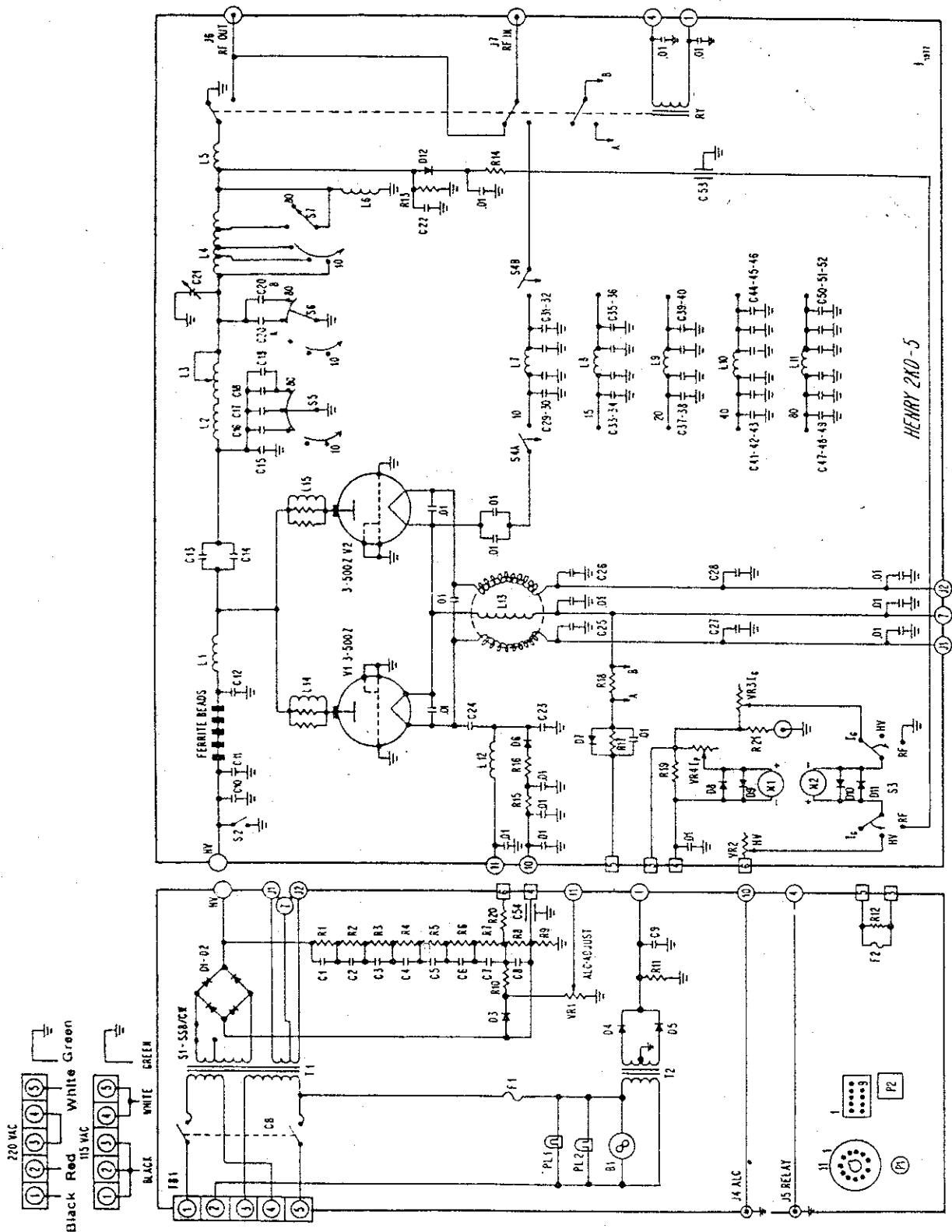


Figure 6. 2KD-5 Schematic Diagram.

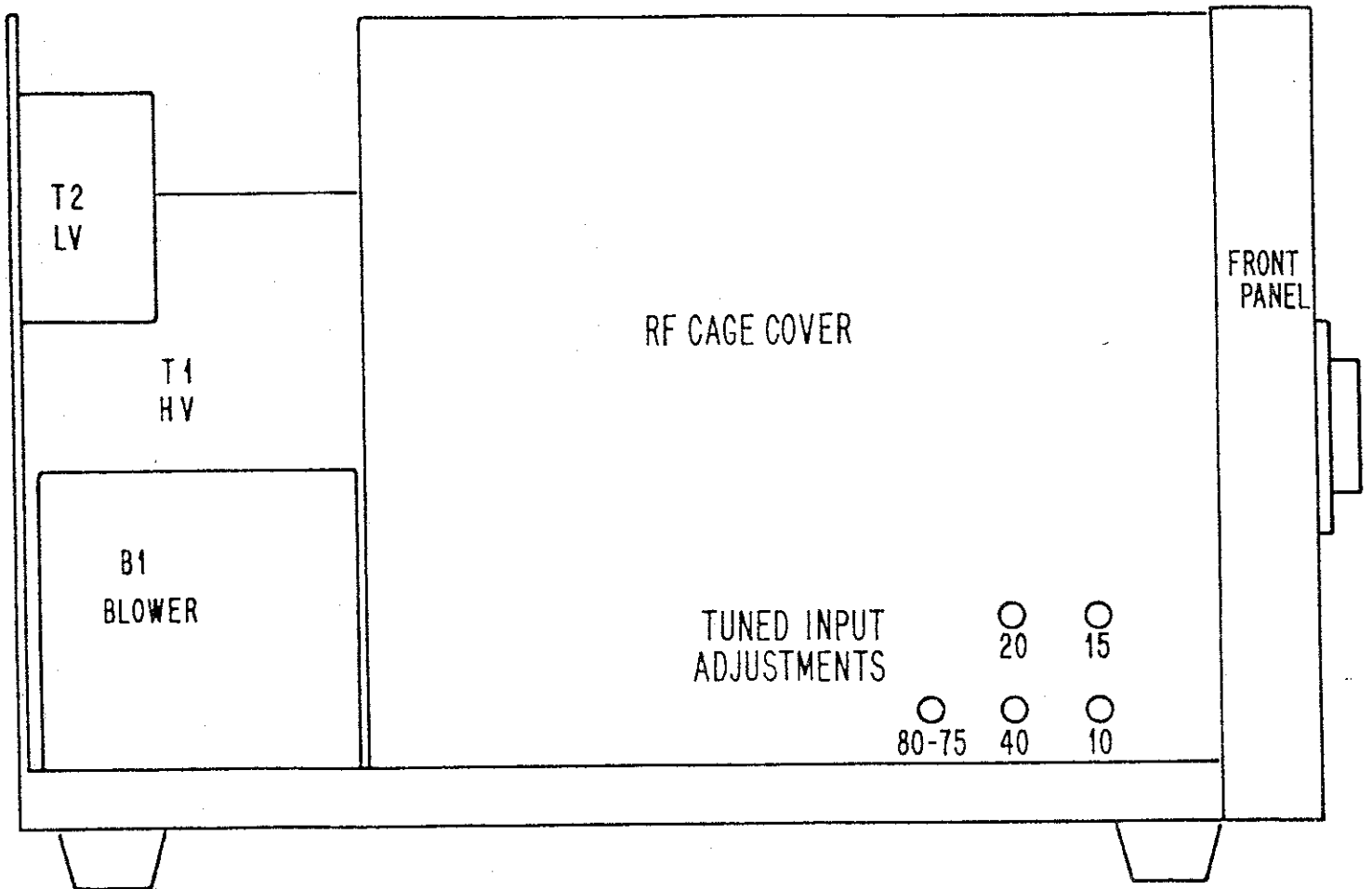


Figure 5. 2KD-5 Side View.



TABLE 1. CALIBRATION DATA

SERIAL No. \_\_\_\_\_

The figures inserted at the factory are approximate settings for a 52 ohm load with an SWR of 1:1.

FACTORY DATA

BAND	Freq. - MHz	SSB			CW		
		TUNE	LOAD	OUTPUT	TUNE	LOAD	OUTPUT
80	3,600						
	3,900						
40	7,100						
	7,200						
20	14,100						
	14,200						
15	21,100						
	21,200						
10*	28,100						
	28,500						
* EXPORT UNITS ONLY		SSB			CW		

This table has the factory calibration data for this amplifier. There is a column in the table for TUNE and LOAD settings for SSB and CW operation.

After you have correctly tuned the amplifier to one of your frequent operating frequencies, record the control settings in the table for future reference. These values should hold constant as long as the load does NOT change. The factory data is only an approximation to aid in tuning the amplifier the first time, and the actual readings can vary considerably, depending on the load.

BAND	Freq. - MHz	SSB			CW		
		TUNE	LOAD	OUTPUT	TUNE	LOAD	OUTPUT
80							
40							
20							
15							
10*							

\* EXPORT UNITS ONLY

## 10 METER MODIFICATION KIT INSTALLATION INSTRUCTIONS FOR THE 2KD5.

The purpose of this kit is to enable the amateur operator to restore use of the 10 METER BAND to the 2KD5 amplifier.

### INSTALLATION

1. Remove the wrap-around cover and the bottom plate from the 2KD5. Turn the amplifier over so you have access to the bottom. Locate the tuned input coil board. This board is located adjacent to the ganged ceramic switch at one side of the 2KD5. You will notice that there is a blank coil form on this board. This is where the 10 meter coil is normally installed. The blank form must now be removed. Once removed, thoroughly clean the area in preparation for installation of the 10 meter input coil. Refer to Fig. A for coil location.

2. Glue the new 10 meter coil in place, and allow it to dry thoroughly. It is suggested that you use one of the new fast drying high tensile strength glues in this installation eg. Super Glue, DuPont or Grip. The use of 2 part epoxy resins is NOT recommended for the following two reasons. 1) A long time is required for the glue to set, and 2) the catalytic action generates a great deal of heat.

NOTE - MOST WKT  
10 m. INPUT IS  
CONNECTED.

Once the coil is secured to the board, route the leads to the back of the input-tuned circuit switch, and solder to the points indicated in Fig. B. This completes all work on the underside of the 2KD5. Turn the right side of the amplifier up, and proceed with the next step.

3. Locate the bandswitch wafer on the back side of the front panel. This wafer is almost flush with the panel, and is directly in front of the fixed capacitor bank. Referring to Fig. C, locate the existing 15 meter stop. This is a small metal tab sticking out at a right angle to the wafer, and is located approximately 7 o'clock on the wafer. Using a screwdriver with a 1/4" wide blade, and a small mallet or hammer, gently tap the upright tab down flush to the wafer.

*Pound*

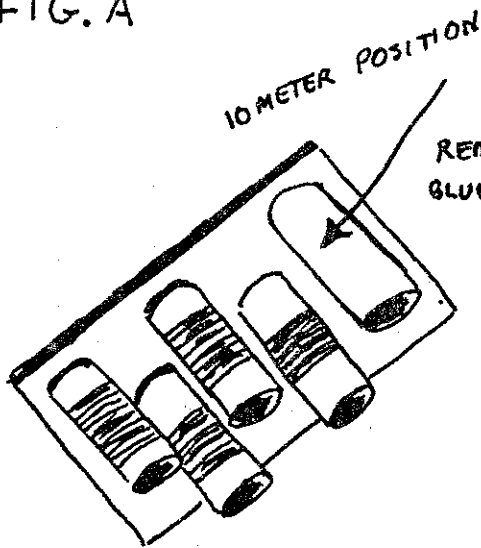
4. Remove the fixed ~~flat~~ wound coil (L2) which runs from L3 to the band switch assembly. Replace the old L2 with the new L2 supplied. This completes the 10 meter modification installation. Leave the wrap-around top cover off, but replace the bottom plate.

### FINAL ADJUSTMENT

Hook up the exciter to the amplifier in the normal manner, and hook the amplifier to a dummy load. With the amplifier off, tune up the exciter on 10 meters for maximum output. Move the exciter drive level control back to about 1/4 of full output. Place the 2KD5 bandswitch in the new 10 meter position, and the multimeter in GRID. In the CW mode, energize the 2KD5. Apply drive from the exciter, and adjust the TUNE CONTROL on the amplifier for minimum current dip. Observing the grid meter, adjust the 10 meter input coil for a peak reading. Switch the multimeter to reflected power, and observe the level. Increase drive to the 2KD5 for a maximum reflected level. Adjust the 10 meter coil for MINIMUM on the reflected scale. Any reading under 100ma. is satisfactory.

# 2KD5

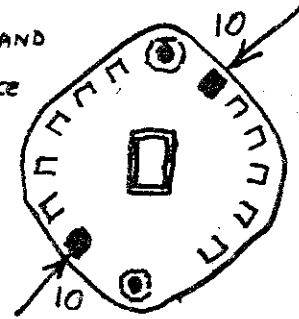
FIG. A



REMOVE BLANK FORM AND  
GLUE NEW COIL IN PLACE

TUNED INPUT BOARD

FIG. B

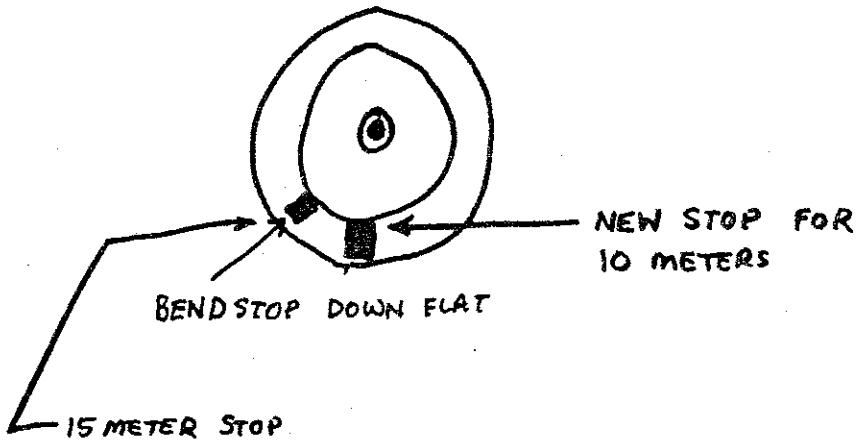


ATTACH LEADS FROM  
NEW COIL TO POINTS  
INDICATED AND SOLD  
IN PLACE

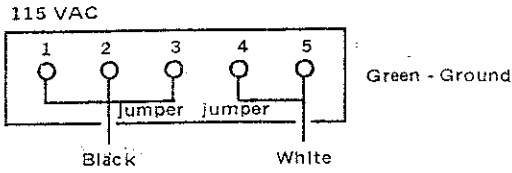
TUNED INPUT SWITCH

FIG. C

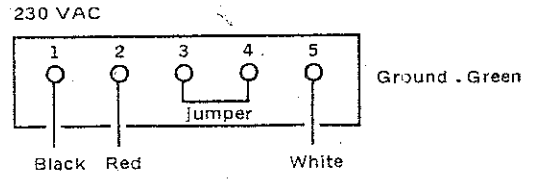
BANDSWITCH WAFER ON  
BACK SIDE OF FRONT PANEL.



ADDENDUM - Henry Amplifier 4-wire Power Cord Wiring Diagram



Black - 115 VAC  
White - 115 VAC  
Green - Ground  
Red - no connection



Black - 230 VAC  
Red - Neutral  
White - 230 VAC  
Green - Ground