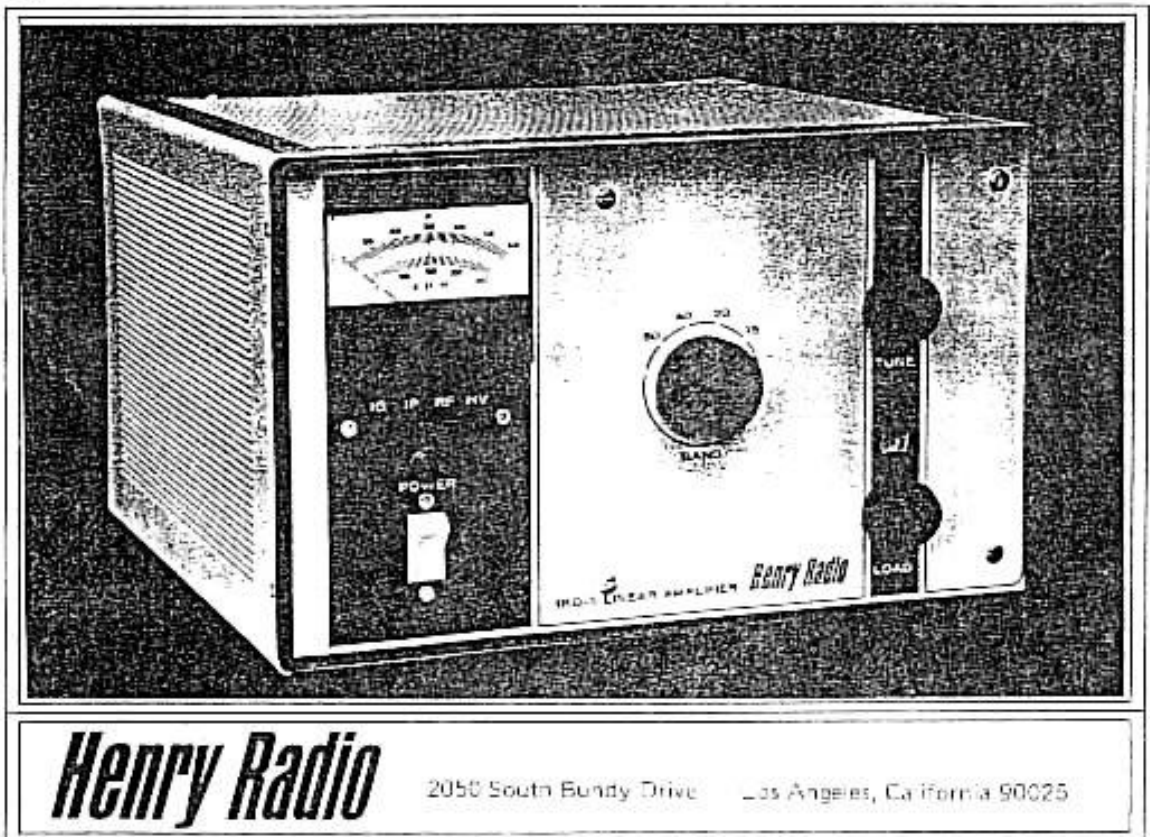


OPERATING AND MAINTENANCE MANUAL

HENRY 1KD-5



HENRY 1KD-5 LINEAR POWER AMPLIFIER SPECIFICATIONS

GENERAL INFORMATION	<p>Type and Function of Equipment: The 1KD-5 is a 1200 watt PEP input (700 watt PEP nominal output) RF linear amplifier, covering the 80, 40, 20 and 15 meter amateur bands. Also 10 meters on units shipped outside the U. S.</p> <p>Tube Complement: Eimac 3-500Z glass envelope triode operating in a grounded grid circuit.</p> <p>Duty Cycle: Full output in intermittent amateur service.</p> <p>Tube Cooling: Forced air.</p> <p>ALC Circuit: ALC Circuit to prevent overdrive from high power exciters, also boosts average talk power.</p> <p>Type of Emission: SSB, CW, RTTY or AM.</p> <p>Antenna Relay: DC Relay system for hum-free operation, requires shorting contact to ground during transmit to key amplifier into transmit.</p> <p>Power Output Indicator: Self-contained relative RF power meter.</p> <p>Tank Circuit: Pi-L plate circuit with a rotary silver plated tank coil for greatest efficiency and maximum attenuation of unwanted harmonics.</p> <p>Input Circuits: Cathode Pi input matching circuits for maximum drive and linearity.</p> <p>Power Supply: Conservative power supply with solid state rectifiers for reliable, long term operation.</p>
RF DATA	<p>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*</p> <p style="text-align: right;">*(Non U. S. models only.)</p> <p>Input Power: 1200 watts PEP input. 1000 watts DC input for CW and RTTY.</p> <p>Output Power: 700 watts PEP nominal - SSB. 600 watts DC nominal - CW and RTTY. 175 watts nominal - AM.</p> <p>Drive Power: 50 to 100 watts nominal, 75 watts for full output.</p> <p>Output Impedance: 52 ohms unbalanced with SWR not to exceed 2:1.</p> <p>Input Impedance: 52 ohms nominal.</p> <p>Harmonic and Spurious Radiation: Second Harmonic - -40db nominal. Third Order Distortion - better than -30 db at full power output.</p> <p>Noise Level: -40 db or better below one tone carrier at 1 KW.</p>
ELECTRICAL DATA	<p>Line Voltage: Jumper for 115 or 230 VAC, 3 wire single phase.</p> <p>Current Requirements: 10 amps (230 VAC) or 20 amps (115 VAC).</p> <p>Plate Voltage: 3000 VDC.</p> <p>Protective Devices: AC Main fuses, Cathode fuse, High Voltage Cabinet Shorting Bar.</p>
PHYSICAL DESCRIPTION	<p>Dimensions: 8.75" high x 14" wide x 15" deep.</p> <p>Weight: 48 Pounds.</p> <p>Shipping Weight: 55 Pounds.</p> <p>Front Panel Controls: On/Off Power Switch, Multimeter, Multimeter Switch, Tune Control, Load Control, Band Switch, and Pilot Light.</p> <p>Rear Panel Controls: ALC Jack, ALC Adjust Potentiometer, Relay Control Jack, BNC RF Input Connector, UHF RF Output Connector, Ground Lug, 15 amp Primary Fuses, 115/230 Terminal Board, 10' 3-Wire Power Cord with no power plug, 1 amp BAG Cathode Fuse.</p> <p>Accessories Supplied: Drive Cable, ALC Cable, Relay Cable & Manual.</p> <p>Metering: Relative RF Output, 0 to 4000 VDC plate voltage, 0 to 400 ma grid current, 0 to 400 ma plate curr.</p> <p>Cabinet: All Aluminum cabinet to eliminate magnetic resonance and double shielded to prevent RF interference.</p> <p>Color: Light Grey wraparound, black trim, brushed aluminum front panel.</p> <p>Manufacturer: HENRY ELECTRONICS, Inc. 11240 West Olympic Blvd. Los Angeles, California 90064</p>

HENRY 1KD-5 OPERATING INSTRUCTIONS

SECTION 1 INTRODUCTION

The 1KD-5 amplifier is a high-quality one-stage linear amplifier using one rugged, proven glass-envelope Eimac 3-500Z triode operating in a grounded grid circuit. The equipment is completely self-contained: a table top, 1000 watt PEP input amplifier using only the highest quality components available. In the tradition of Henry amplifiers, the 1KD-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 24 MHz. The amplifier can be factory modified for frequencies outside the amateur bands for commercial or military operation. Units sold outside the United States operate to 30 MHz. The 1KD-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 WHEN 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 1KD-5 should you ever decide to ship or move it to another location. The amplifier is shipped without the tube installed. Before operation, you must install the 3-500Z tube 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 3AG, 15 Amp Fuses |
| 1 PL-259 Coax Connector | 5 8AG, 1 Amp Fuses |
| 1 RF Input Cable | |

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 TUBE

Remove the cabinet wraparound (screws on the bottom) and the interior top shield, giving access to the interior of the RF section of the amplifier.

Put the 3-500Z tube in its socket. Install the tube so that the screw which holds the plate strap is toward the power transformer. Be careful not to put any strain on the glass portion of the tube. It is easily damaged. Set the air system chimney in place, making sure the pyrex cylinders are pushed down flush against the chassis and gripped on the inside of the glass by the spring clips mounted on the chassis. When the chimney is in place, check to see that the formed top of the chimney allows at least $\frac{3}{4}$ " of clearance from the tube envelope so air can circulate from the bottom to the top of the tube for efficient air cooling. Fasten the plate lead to the anode connector. Remove the screw in the top of the 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 above the power transformer is not shorting after the top shield has been replaced.

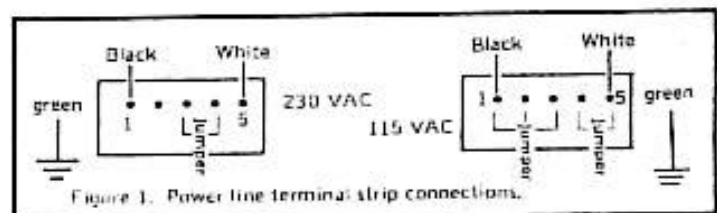
Section 2-4 CABLING

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

POWER CABLE - The 1KD-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.

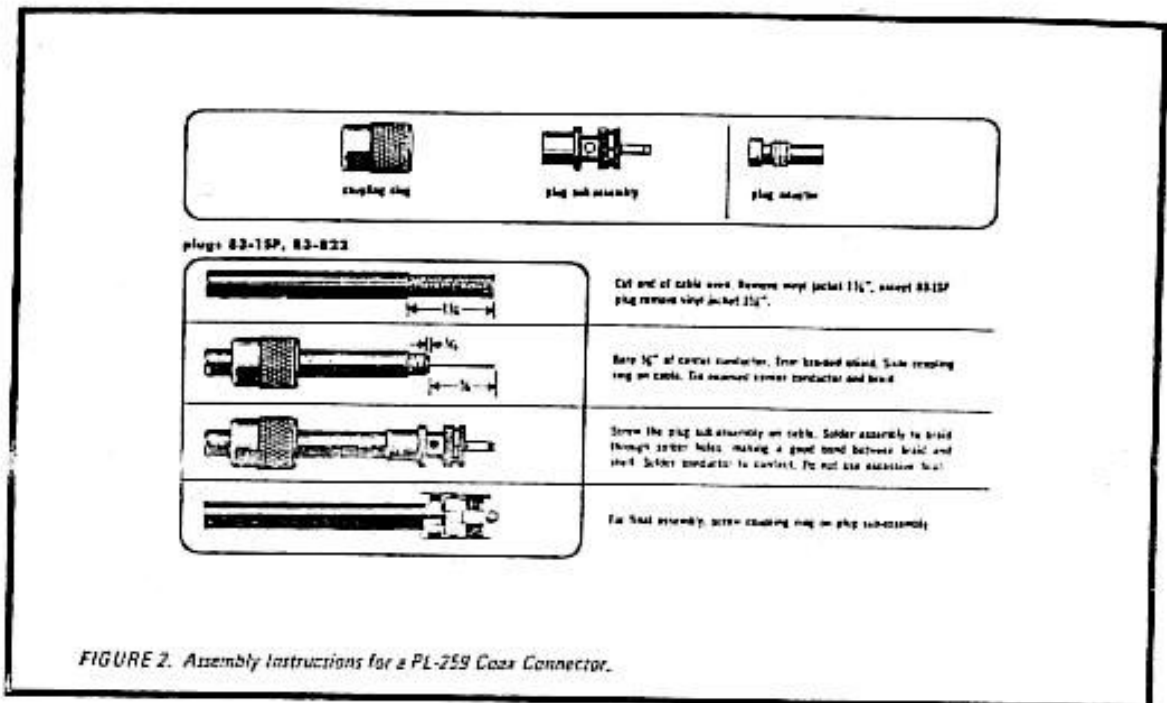
CAUTION: The amplifier will be damaged if the green wire is connected incorrectly. Be certain to disconnect the power cord from the AC line before changing the jumper terminals.

ANTENNA COAX - Use only RG-8/U coax (or its equivalent) to connect the 1KD-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 amp.



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 1KD-5 turned off, the exciter's output will pass through the amplifier directly to the antenna.

DRIVE CABLE - The 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 CABLE (Automatic Level Control) - Plug the gray ALC cable into the ALC 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 1KD-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

POWER SWITCH - This switch is used for turning the amplifier on and off. When the 1KD-5 is turned off, the output of the exciter passes through the amplifier directly to the antenna.

MULTIMETER SWITCH - This 4 button 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.

IP - With the switch in this position the meter monitors the amplifier's plate current. The full scale meter reading in this position is 600 ma DC. The nominal plate current during operation is approximately 325 to 600 ma for full output.

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. 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 800 watts PEP output for SSB operation.

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

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 on 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 Models 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 1KD5'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.

INPUT CONNECTOR - This BNC coax connector accepts the drive line from the exciter. The

input impedance of the amplifier is 50 ohms.

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.

3AG 15 AMP FUSES - These 3AG 15 Amp fuses protect the primary AC line circuit from shorts. Never exceed the recommended current rating when replacing the fuse.

8AG 1 AMP FUSE - This 8AG 1 Amp fuse is the cathode fuse. Never use a higher amperage fuse than the one specified.

10-75, 40, 20, 15, 10 - The input matching coils are mounted at the back panel for ease of adjusting the SWR match between the exciter and the amplifier.

AC POWER CONNECTOR TERMINAL BOARD - This terminal board is used to adjust the power transformer taps for 115 or 230 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 line.

Turn on the 1KD-5 with the power switch. 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 filament of the 3-500Z tube is lighted and place your hand directly above the tube to make certain air is circulating in the cooling system. The 3-500Z tube requires 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 IP reading should show a resting current between 75 and 100 ma.

NOTE: The 3-500Z tube should show color, glowing a dull cherry red with 200 ma of plate current, and possibly a bright orange at 400 ma. When so operated, the tube is well within its 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 tube with 400 ma for long periods of time in an off resonance condition. Depending on the line voltage, the plate current will be between 325 and 400 ma for 700 watts output.

Section 4-2 SSB OPERATION

Set the multimeter switch to IP. With the exciter adjusted for zero output, press the PTT switch of the exciter, causing the exciter and the 1KD-5 to be keyed into the transmit mode. The amplifier's plate current reading should show a resting plate current between 75 and 100 ma. Increase the RF output of the exciter until the amplifier's plate current is about 200 ma. Select the RF position on the multimeter. 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 130 and 140 ma.

- Step 1 If the plate current is less than 400 ma, increase the loading of the amplifier slightly by moving the LOAD control to a higher number. If the plate current is more than 400 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 130 and 140 ma.

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

- IG - 130 to 140 ma.
- IP - 400 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.

Place the exciter into the SSB mode and adjust the exciter's microphone gain control for voice peak readings of about 200 ma on the amplifier's plate current reading. The grid current will peak between 25 and 50 ma. Check for proper drive with a monitor scope if one is available.

Section 4-3 CW OPERATION

Tune the amplifier as described in section 4-2 substituting the following operating parameters:

- IG - 125 to 135 ma
- IP - 280 to 300 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 the 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.

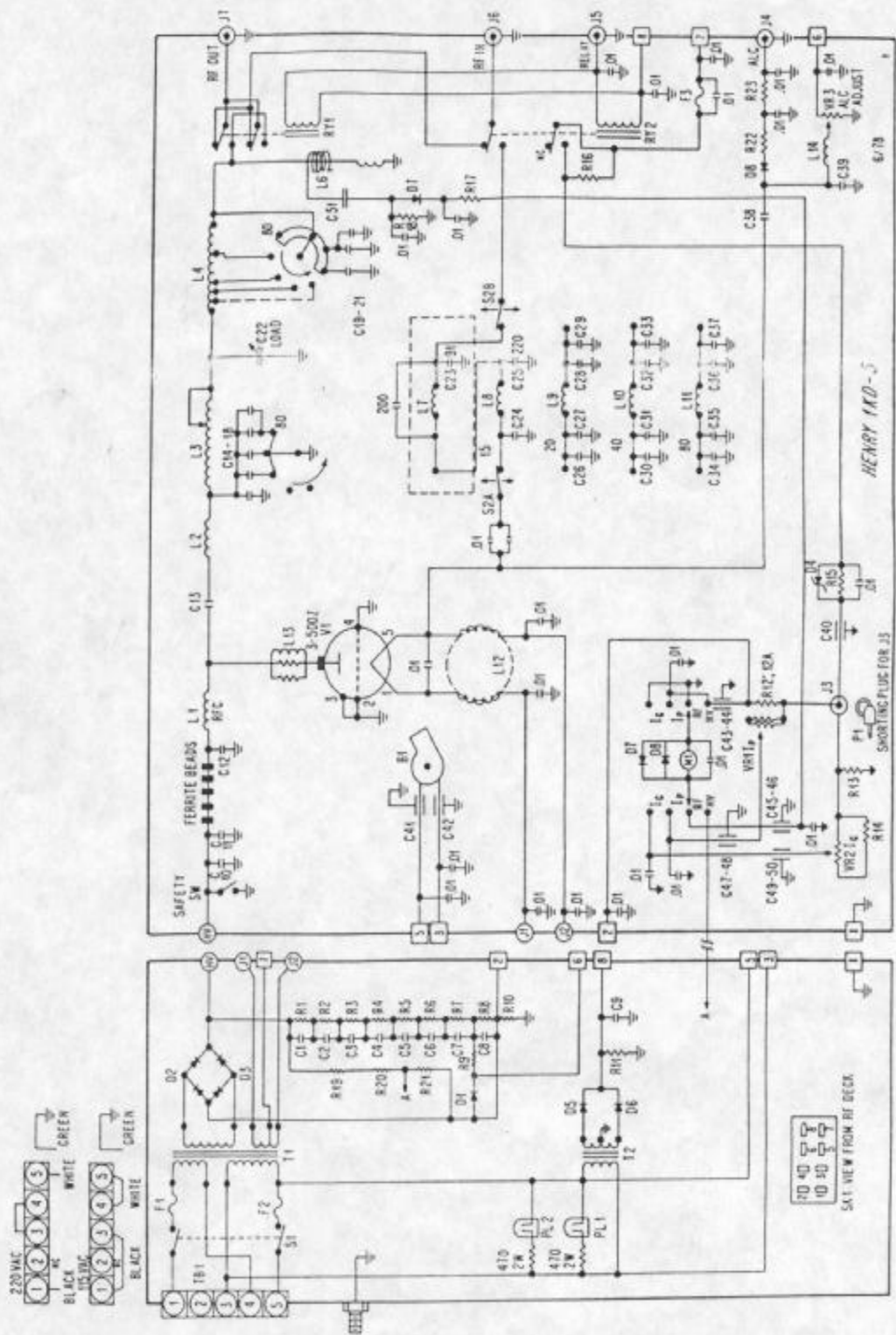
With the ALC ADJUST control fully counter-clockwise, tune the amplifier for SSB operation. Drive the amplifier to about 400 ma of plate current and then rotate the ALC ADJUST control clockwise until the grid current just begins to decrease. If the exciter cannot drive the 1KD-5 to 400 ma of plate current, 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 200 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.



HENRY 1KD-9 PARTS LIST

SCHEMATIC NO.	DESCRIPTION	MANUFACTURER OR EQUIVALENT
B1	BLOWER: 110 VAC.	Howard J 90-8506
CAPACITOR		
.01	Ceramic Disc, .01 mf, 600 Volt.	Centralab DD5-103
C1-C5	Electrolytic, 190 mf, 450 VDC.	CDE FAH 190-450A3
C9	Electrolytic, 500 mf, 25 VDC.	Arco MEJ-500
C10, C11	Ceramic Disc, .001 mf, 6KV.	Centralab DD60-102
C12	Ceramic Disc, .0047 mf, 6KV.	Sprague 60GA-D47
C13	Ceramic Transmitting, 300 pf, 5,000 VDC.	Centralab 8585-1000
C14, C15	Ceramic Transmitting, 25 pf, 5,000 VDC.	Centralab 8505-257
C16	Ceramic Transmitting, 50 pf, 5,000 VDC.	Centralab 8505-502
C17	Ceramic Transmitting, 100 pf, 5,000 VDC.	Centralab 8505-100Z
C18	Ceramic Transmitting, 30 pf, 5,000 VDC.	Centralab 8505-30Z
C19, C20	Ceramic Transmitting, 75 pf, 5,000 VDC.	Centralab 8505-75N
C21	Mica Transmitting, .0005 1.2 KV.	Aerovox 1445
C22	Variable Air (Loading)	All Star 731-45-41
C23	Silver Mica, 50 pf, 500 VDC.	Arco DM15-500J
C24, C25	Silver Mica, 91 pf, 500 VDC.	Arco DM15-910J
C26, C27	Silver Mica, 120 pf, 500 VDC.	Arco DM15-120J
C28, C29	Silver Mica, 220 pf, 500 VDC.	Arco DM15-220J
C30, C31	Silver Mica, 200 pf, 500 VDC.	Arco DM15-200J
C32, C33	Silver Mica, 250 pf, 500 VDC.	Arco DM15-250J
C34	Silver Mica, 430 pf, 500 VDC.	Arco DM15-430J
C35	Silver Mica, 470 pf, 500 VDC.	Arco DM15-470J
C36, C37	Silver Mica, 560 pf, 500 VDC.	Arco DM15-560J
C38, C39	Silver Mica, 470 pf, 500 VDC.	Arco DM15-470J
C40-C50	Ceramic, Feed through, 2000 pf, 600V.	Erie 202M
DIODE		
D1	Diode	Motorola HEP 2545
D2, D3	Diode, 15KV	Semtech 5DHD-15K
D4	Diode, Z10V, 1.2A.	Semtech 5534
D5, D6	Diode, Rectifier, 1000 PIV, 1 amp	SC1 VCSTN 142
D7, D8	Diode, Rectifier, 1000 PIV, 1 amp	GE-509
D9	Diode, Rectifier, 1000 PIV, 1 amp	Motorola HEP 2545
FUSE		
F1, F2	3AG15Amp	Littlefuse 312-15
F3	Fuse Holder 3AG	Little Fuse 342.004
	8AG 1 amp	Littlefuse 361-1
	Fuse Holder 8AG	Littlefuse 348.875
CONNECTORS		
HV	High Voltage Plug and Socket	Millen 37501
J1, J2	Pin Jack and Socket	Smith 101 & 102
J3, J4, J5	ALC, Relay control & T. P. Chassis Jack	RCA Phono, Switchcraft 3501FP
J6	RF in, coax	Amphenol 31-203-UG-209 A/U BNC
J7	RF out, coax	Amphenol 83-IR-50239 uhf
J8	Connector: Hood	Amphenol 83-11-UG-106U
J9	Connector	5-3308AB
J10	Connector	P-3308CCT
P1	Plug: T.P. Shorted	RCA Phono-Henry Rework
COIL		
L1	Inductor: RF Plate Choke	Henry L1-1KD5
L2	Inductor: Tank Coil	Henry L2-1KD5
L3	Inductor: Tune Control Variable	Henry L3-1KD5
L4	Inductor: Tank Coil	Icore 1608-002
L5	Inductor: 2.5 mh 150 ma	Miller 4555
L6	Inductor: RF Choke	Henry L6-1KD5
L7 (Delete in USA)	Inductor: 10 Meter Input coil	6T, No. 18 ga. on 1/2" form.
L8	Inductor: 15 Meter Input Coil	7T, No. 18 ga. on 1/2" form.
L9	Inductor: 20 Meter Input Coil	8T, No. 18 ga. on 1/2" form.
L10	Inductor: 40 Meter Input Coil	13T, No. 18 ga. on 3/4" form.
L11	Inductor: 80 Meter Input Coil	19T, No. 20 ga. on 1/2" form.
L12	Inductor: Toroid Filament Choke	Henry L12-1KD5
L13	Inductor: Parasitic Choke	Henry L13-1KD5
L14	-Copper Strip & 2 150 ohm Resistors- Inductor: RF Choke 2.5 mh 150 ma	Miller 4555

SCHEMATIC NO.	DESCRIPTION	MANUFACTURER
PL1	Pilot Light Assembly	101 B-1050-C1
RESISTOR		
R1-R7	Enamel, Wire Wound, 20K ohm, 20 watt, 5%	
R8	Enamel, Wire Wound, 40K ohm, 20 watt, 5%	
R9	Enamel, Wire Wound, 22.5K ohm, 10 watt, 5%	
R10	Enamel, Wire Wound, 200 ohm, 20 watt, 5%	
R11	Carbon, 150 ohm, 2 watt, 10%	
R12	Enamel, Wire Wound, .6 ohm, 10 watt, 5%	
R13	Enamel, Wire Wound, 5 ohm, 10 watt, 5%	
R14	Carbon, 4.7K ohm, 1/2 watt, 10%	
R15	Carbon, 220 ohm, 2 watt, 10%	
R16	Carbon, 10K ohm, 2 watt, 10%	
R17	Carbon, 100 ohm, 1/2 watt, 10%	
R18	Carbon, 2K ohm, 1/2 watt, 10%	
R19, R20	Carbon, 2 Meg., 2 watt, 10%	
R21	Carbon, 10K ohm, 2 watt, 10%	
RELAY		
RY1-RY2	2PDT, 12 VDC Socket	Guardian 1365-PC26-12D Guardian 1360-1
SWITCH		
S1	On/Off, 2PST, 15 amp, 230 VAC	Allied 8142K21F6M52T
S2	Band switch, Input Section	Henry S2-1KD5
S3	Band switch	Henry S3-1KD5
S4	Band switch	Henry S4-1KD5
S5	Multimeter, 4 Position	Switchcraft 6-5041K-206
TRANSFORMER		
T1	Transformer	ECA 1111
T2	Transformer, 24V. C.T.	241-6-24 Signal
TB1	AC Input Terminal Board	Cinch 5-142
POTENTIOMETER		
VR1	Plate Current Metering Adjust	Allen Bradley 1000 ohm
VR2	Grid Current Metering Adjust	Allen Bradley 1000 ohm
VR3	A. L. C. Adjust	Allen Bradley 100K ohm
TUBE		
V1	High Mu Power Tube, 3-500Z Socket, 5 pin ceramic	Elmac 3-500Z Johnson 122-0275