

Operating Manual

DTR-1200L

Linear Amplifier



DENTRON

RETAIN THIS SHEET WITH YOUR DTR-1200L MANUAL AS IT CONTAINS IMPORTANT CHANGES

TUNING PROCEDURE:

PAGE 7, #6

APPROXIMATE SETTINGS FOR THE TUNE CONTROL ARE LISTED BELOW:

80 METERS: 75
40 METERS: 50
20 METERS: 25
15 METERS: 10

INSTALLATION:

PAGE 6, #3

CONNECT THE THREE (3) MOLEX PLUGS BETWEEN THE TRANSMITTER AND THE 1200L WIRING. MAKE SURE THE PLUGS ARE FULLY MATED AND THE NUMBERS ON THE TRANSFORMER WIRES AND THE 1200L WIRES MATCH.

INTERCONNECTION DIAGRAM:

PAGE 6

THE ACCESSORY JACK MARKED 12VDC IS A 12VAC OUTPUT JACK.

ALC ADJUSTMENT:

THE DTR-1200L IS SET FOR A NEGATIVE GOING ALC SYSTEM WHICH IS COMPATIBLE WITH MOST EXCITERS CURRENTLY AVAILABLE. IF THE EXCITER IN YOUR STATION REQUIRES A POSITIVE GOING ALC SYSTEM, DIODE D2, IN THE POWER DECK OF THE DTR-1200L, WILL HAVE TO BE REVERSED TO MAKE THE DTR-1200L COMPATIBLE.

ONCE THE DTR 1200L HAS BEEN PROPERLY TUNED FOR THE OPERATING FREQUENCY, A TWO-TONE MODULATED SIGNAL MAY BE APPLIED TO THE EXCITER AND THE ALC ADJUSTED FOR THE PROPER THRESHOLD AS FOLLOWS:

IF AN OSCILLOSCOPE IS AVAILABLE ADJUST THE ALC THRESHOLD FOR THE PROPER TRAPEZOIDAL OR CARRIER-WAVE PATTERN AS SHOWN BELOW:



LESS THAN 100% MODULATION



100% MODULATION



OVERMODULATION



LESS THAN 100% MODULATION



100% MODULATION



OVERMODULATION

IF AN OSCILLOSCOPE IS NOT AVAILABLE, SET THE DTR-1200L MULTIMETER SWITCH IN THE REL-OUT POSITION, AND ADJUST THE ALC CONTROL UNTIL A SLIGHT DECREASE IN THE METER READING IS OBSERVED.

TUNE



DTR-1200L

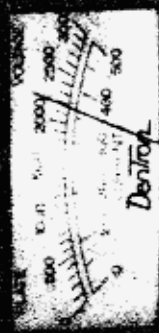


BAND



LFO

MULTIMETER



Denton RADIO CO



REL OUT



SENS



NORMAL



PLATE VOLTAGE



MAIN CURRENT

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Introduction

The DenTron DTR-1200L linear amplifier was designed to provide 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. Two rugged but economical 572-B triodes are used in grounded grid to deliver a full 1000 Watts DC input on CW, and 1200 Watts PEP input on SSB. A dual primary transformer allows for both 117V AC and 234V AC operation.

The DTR-1200L has an input Z matching network, thus making it compatible with virtually any exciter. ALC is provided for, with front panel adjustment. Front panel controls include a linear bypass function, band-switching from 80-15 meters, and metering of plate voltage, plate current and relative output with a switchable illuminated dual scale meter.

Your new DTR-1200L 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:

80 Meter Band	3.45 - 4.6 MHz
40 Meter Band	6.00 - 9.0 MHz
20 Meter Band	10.00 - 16.00 MHz
15 Meter Band	20.95 - 23.50 MHz

The DTR-1200L will cover most MARS frequencies just outside the Amateur Bands. (With proper input Z match and band switch modification, the unit will also cover the 10 meter amateur band.)

Modes:	USB, LSB, CW, RTTY, SSTV
Power Input:	1200W - SSB, 1000W - CW
Power Requirements:	234/117 VAC 50/60 Hz
RF Drive Power:	150 Watts maximum and 65 Watts minimum for 1 KW DC input.
DC Plate voltage:	Idle + 2200V 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 front panel
Spurious Emissions:	IMD - greater than 30 db down Harmonics - greater than 40 db down
FCC Type Accepted	
Size:	5¼" H x 17" W x 13" D (19" W with rack brackets)
Weight:	46 pounds

!!WARNING!!

TO TAKE FULL ADVANTAGE OF THE DTR-1200L COOLING SYSTEM, IT IS HIGHLY RECOMMENDED THAT THE UNIT BE CHECKED FOR PROPER CLEARANCE BEHIND THE INTAKE AND EXHAUST IN THE RIGHT REAR CORNER OF THE UNIT.

Theory of Operation

AC power is supplied to the DTR-1200L through fuse F1 and PWR Switch SW-3. 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. The voltage doubler consists of diodes M4G5 (12) and Capacitors .01 (12). The voltage doubler provides 2200 VDC 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 filament choke.

The two 1 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 RF in if amp is in standby and is then sent out to RF output. If amp is in operation, signal passes through SW1A and SW1B, an impedance matching device, through C7 and C8 to cathode (filament) of tubes. It is amplified through two 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 L2, L3, tune load, and SW1. These allow the amp to be tuned from 3.45 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 main fuse 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 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 DTR-1200L in service outside the cabinet. Contact with voltages in this amplifier can be *fatal to the human body*.
2. Never attempt to operate the DTR-1200L with drive power of more than 150 watts!
3. Never attempt to operate the DTR-1200L 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 DTR-1200L.
6. Do not cover the rear of the DTR-1200L with books, papers, curtains 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 DTR-1200L, 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 DTR-1200L 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.

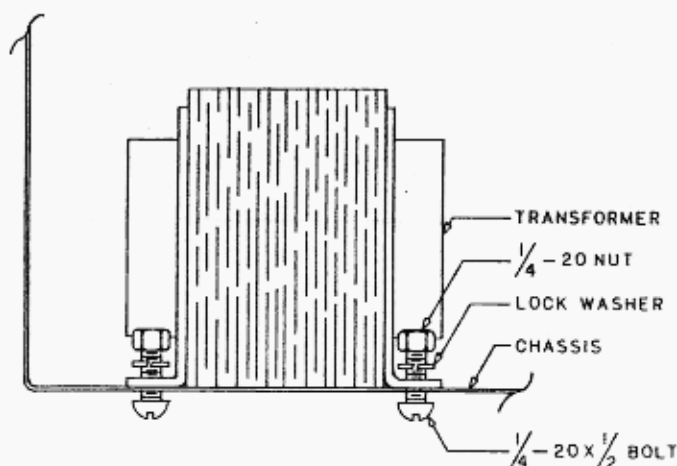
Fully complete the DenTron Warranty Registration card included in this manual and return it to DenTron. Do not destroy the packing material, since it will be usable later should you require factory service or need to transport the amplifier for any other reason.

In general, the location of your new DTR-1200L is not critical. Be certain, however, to leave enough room behind the unit to allow for proper air flow.

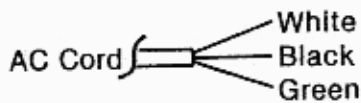
Installation

The DTR-1200L 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.

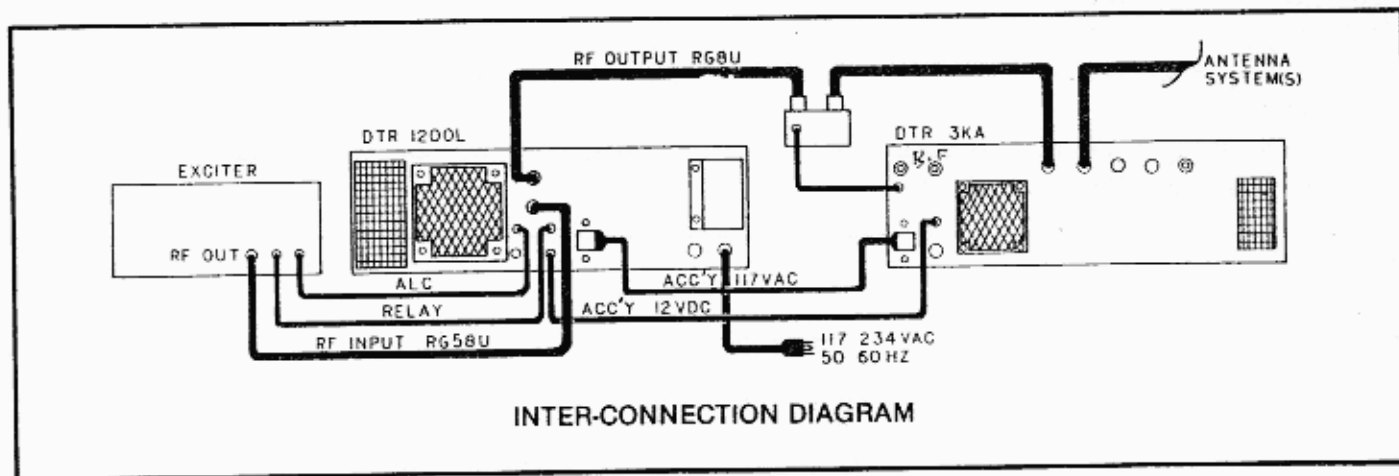
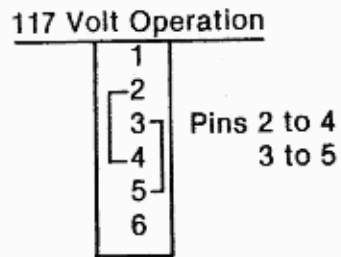
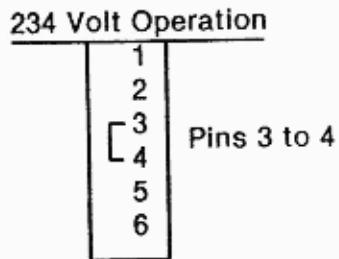
1. Remove the eight screws (three each side and two in rear) holding the top of cabinet in place and remove top.
2. CAREFULLY install transformer in upper left corner and secure with $\frac{1}{4}$ x 20 bolts, lockwashers and nuts as shown in Index 1.



3. Connect the two moxle plugs between the transformer and the 1200L wiring. Make sure the plugs are fully mated.
4. Position the DTR-1200L so that the rear of the unit is clear of all obstructions. This will assure adequate air circulation.
5. Connect a wattmeter and a 50 ohm load (such as DenTron Big Dummy), to the output connector using RG8/U or its equivalent.
6. Connect the 1200L keying lead to your transmitter using shield cable (See the interconnect diagram). The 1200L requires closed contacts to ground on transmit.
7. Connect the RF input jack to the transmitter Rf output using 50 ohm coax.
8. Connect the 1200L ALC output to the transmitter ALC input using shielded cable. (See your exciter owner manual.)
9. Connect as short a ground lead as possible from a good earth ground to the unit's rear panel GND terminal.

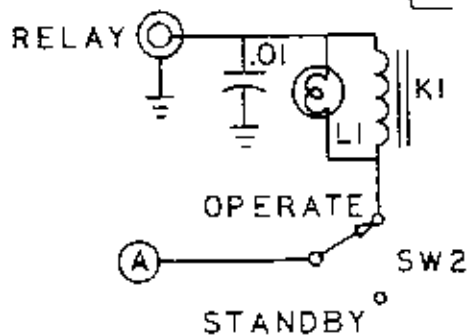
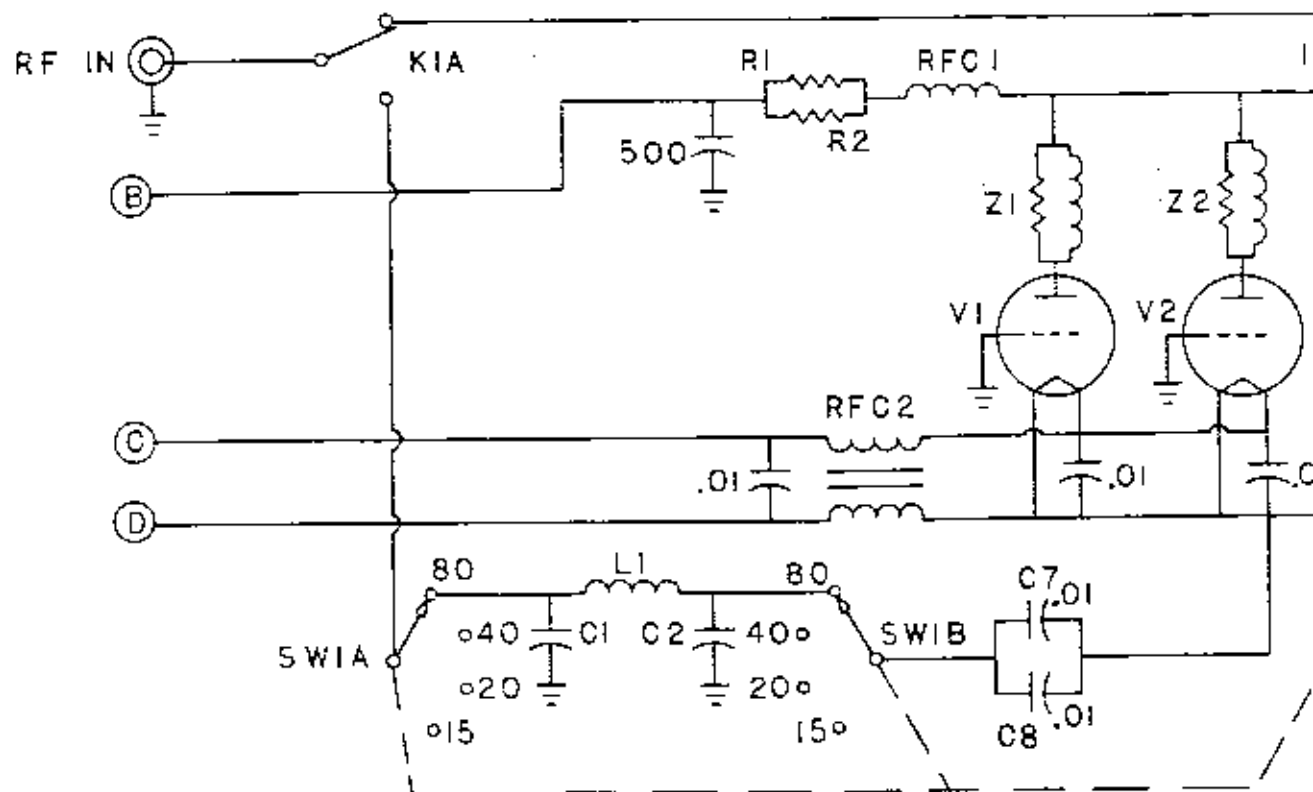


White = 1 side of 234V (117V)
 Black = other side of 234V (117V)
 Green = Ground

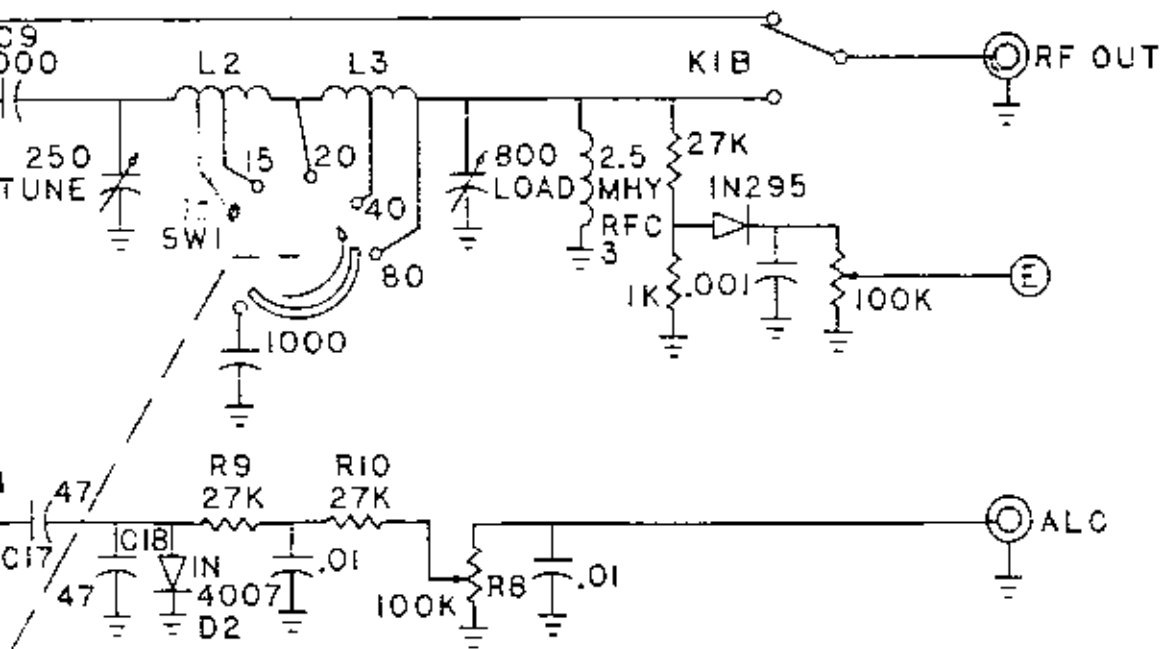


Tuning Procedure

1. Position the 1200L front panel switches as follows:
PWR - OFF
STDBY/OPRTE - STDBY
PLATE VOLTAGE - OFF
METER SWITCH-PLATE VOLTAGE (Vp)
DUTY - NORMAL
2. Insert the AC line cord into the appropriate outlet.
3. Turn the main power switch to "ON." Turn plate voltage to "ON." Plate voltage should read approximately 2200 VDC, and plate current should read 0 MA.
4. Allow a few seconds for tube warm up.
5. (80M through 20M), set the load control at 1. (15M), set 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 meter switch to current (Ip).
9. Tune the DTR-1200L for maximum output 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 retune amplifier until 1 KW DC input is achieved.
NOTE: Check the position of the plate voltage switch to make sure it is in the on position.
10. Use the following formula to calculate the DC input level to the 1200L: PLATE CURRENT X PLATE VOLTAGE = POWER.
EXAMPLE: 2000 Volts DC x .500 Amps DC = 1KW Input.
11. Once you have reached the 1 KW DC input level you need only put the exciter in the SSB position for voice operation.



BAND	C1	L1	C2
80M	270PF	2.5 μ HY	—
40M	510PF	1.3 μ HY	1000 PF
20M	150PF	.6 μ HY	330PF
15M	150PF	.3 μ HY	12 PF



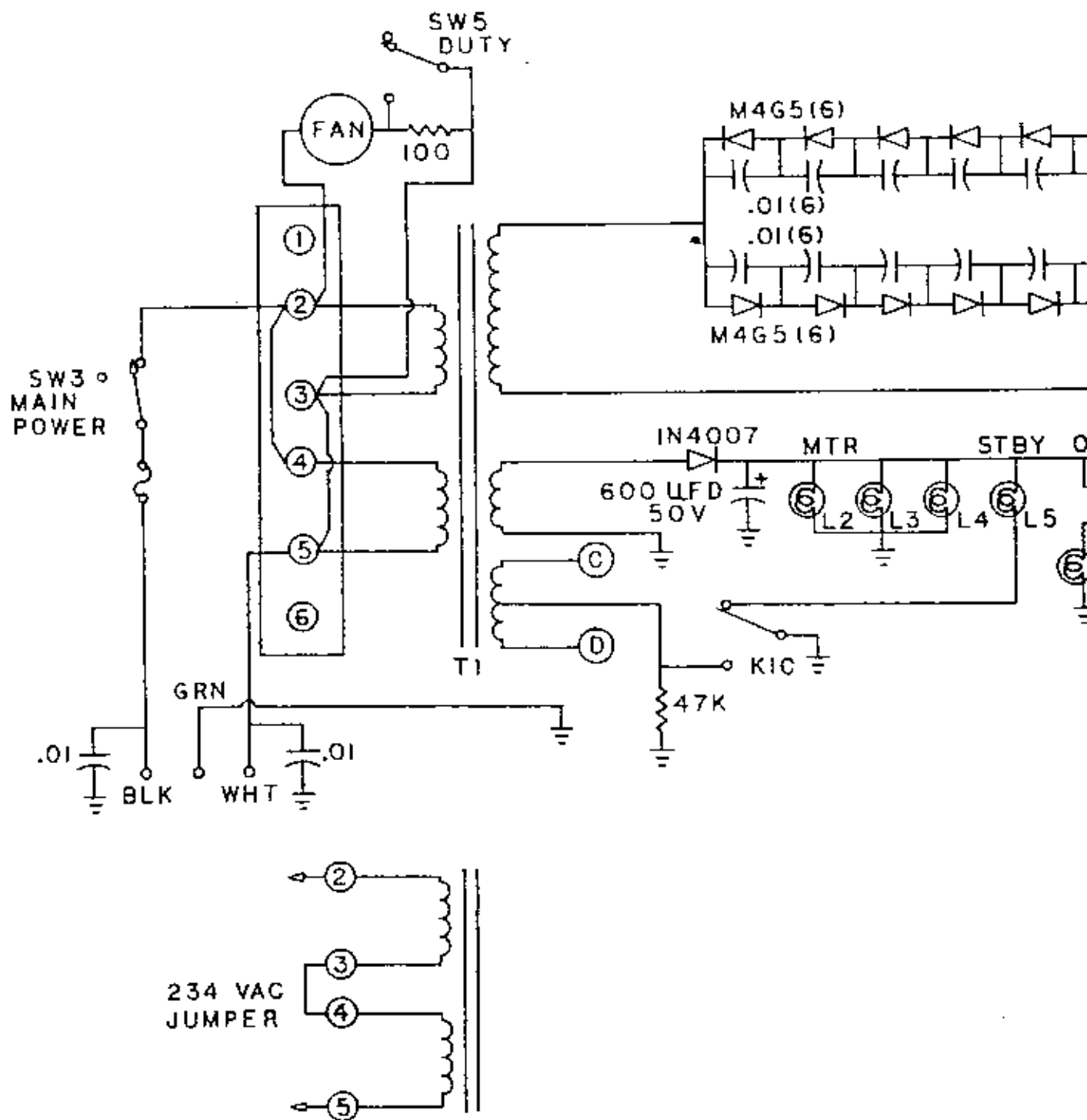
SCHEMATIC DTR-1200L

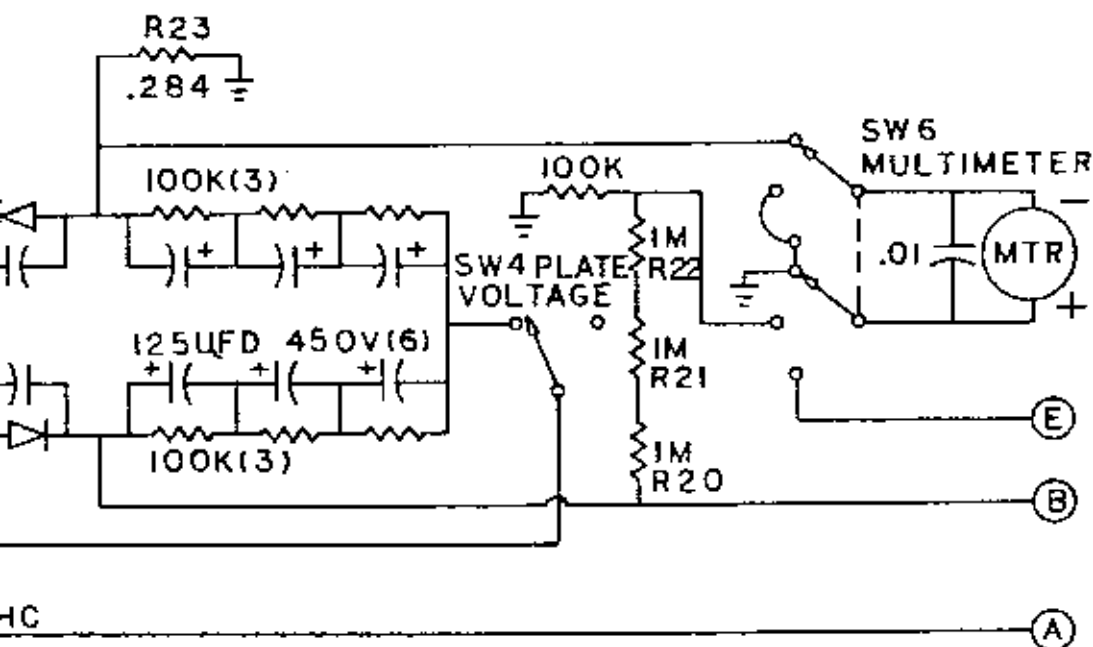
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Dentron RADIO CO.

POWER DECK

DRAWING NUMBER
19-013





HC

SW7

L6

SCHEMATIC DTR-1200L

SCALE _____

APPROVED BY:

DRAWN BY *CD*

DATE:

REVISED

Denton RADIO CO.

POWER SUPPLY

DRAWING NUMBER

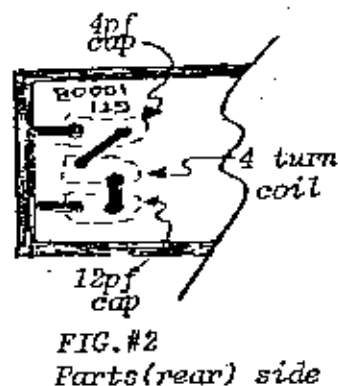
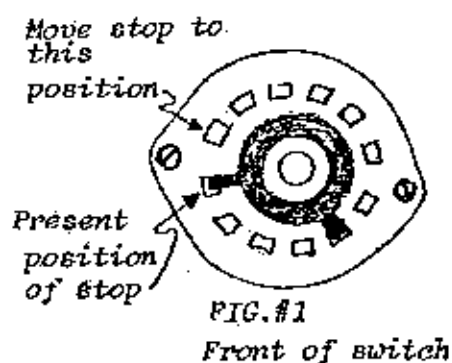
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DTR-1200L MODIFICATION FOR 10 METERS

WARNING!!

AFTER COMPLETELY REMOVING ALL POWER FROM THE DTR-1200L, WAIT 30 MINUTES FOR THE ELECTROLYTICS TO DISCHARGE THRU THE BLEEDER RESISTORS.

1. Remove top 3 allen screws on both side of amplifier. Remove 3 top screws on rear of amplifier. Remove top cover.
2. Remove bandswitch knob. Remove the nut holding bandswitch to front panel. Be careful not to scratch the front panel.
3. Slide switch/PC board assembly towards the rear of the unit, just far enough to allow an open end wrench to be inserted in front of the switch. Slightly bend the tank coil wires downward to allow switch movement.
4. Loosen nut on front of switch with wrench. Back the nut out just far enough to allow the stops to be adjusted.
5. Set stops as shown in Figure #1. Tighten nut down to hold stops in place.
6. Insert coil and capacitors as shown in Figure #2.
7. Solder components, on both sides of PC board.
8. Slide switch/PC board assembly into place.
9. Replace nut and knob on bandswitch.
10. Check all wiring to be certain nothing is touching from moving the bandswitch.
11. Replace top cover.



Limited 90 Day Warranty

DenTron Radio is proud of the quality and workmanship of its communication equipment. If properly installed and operated in accordance with our instruction manual, it will give reliable performance. DenTron Radio extends to you as an owner of a new DenTron Radio Product the warranty set forth below:

For ninety (90) days from the date of original retail purchase, DENTRON RADIO CO. will either repair or replace, at its option, free of charge, any part or parts found to be defective in material or workmanship. Transportation charges for any parts submitted for replacement under this warranty must be paid by the purchaser.

This warranty will not apply to any part which has become inoperative due to misuse, excessive use, accident, neglect, improper maintenance, alterations, or unless the unit has been operated and maintained in accordance with the instructions furnished.

This warranty will not apply where the unit has been used commercially or when the unit has been used in conjunction with accessories not manufactured by DENTRON RADIO CO.

All implied warranties are limited in duration to ninety (90) days from the date of original retail purchase.

The provisions of this warranty specifically exclude any warranty or remedies for incidental or consequential damages.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

In order to obtain warranty service, send written notification to the following address: DENTRON RADIO CO., Attn: Service Dept., 1605 Commerce Drive, Stow, Ohio 44224.

Any written notification should include the model number of the unit, date and place of purchase, and a description of the defective part or condition. Do not return the unit or any parts unless requested to do so by DENTRON RADIO CO.

Although the return of the DENTRON Warranty Registration Card is not a condition precedent to warranty coverage and performance, the purchaser is encouraged to promptly return the Warranty Registration Card upon purchase in order to more easily facilitate the handling of any future service under these warranty provisions.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.