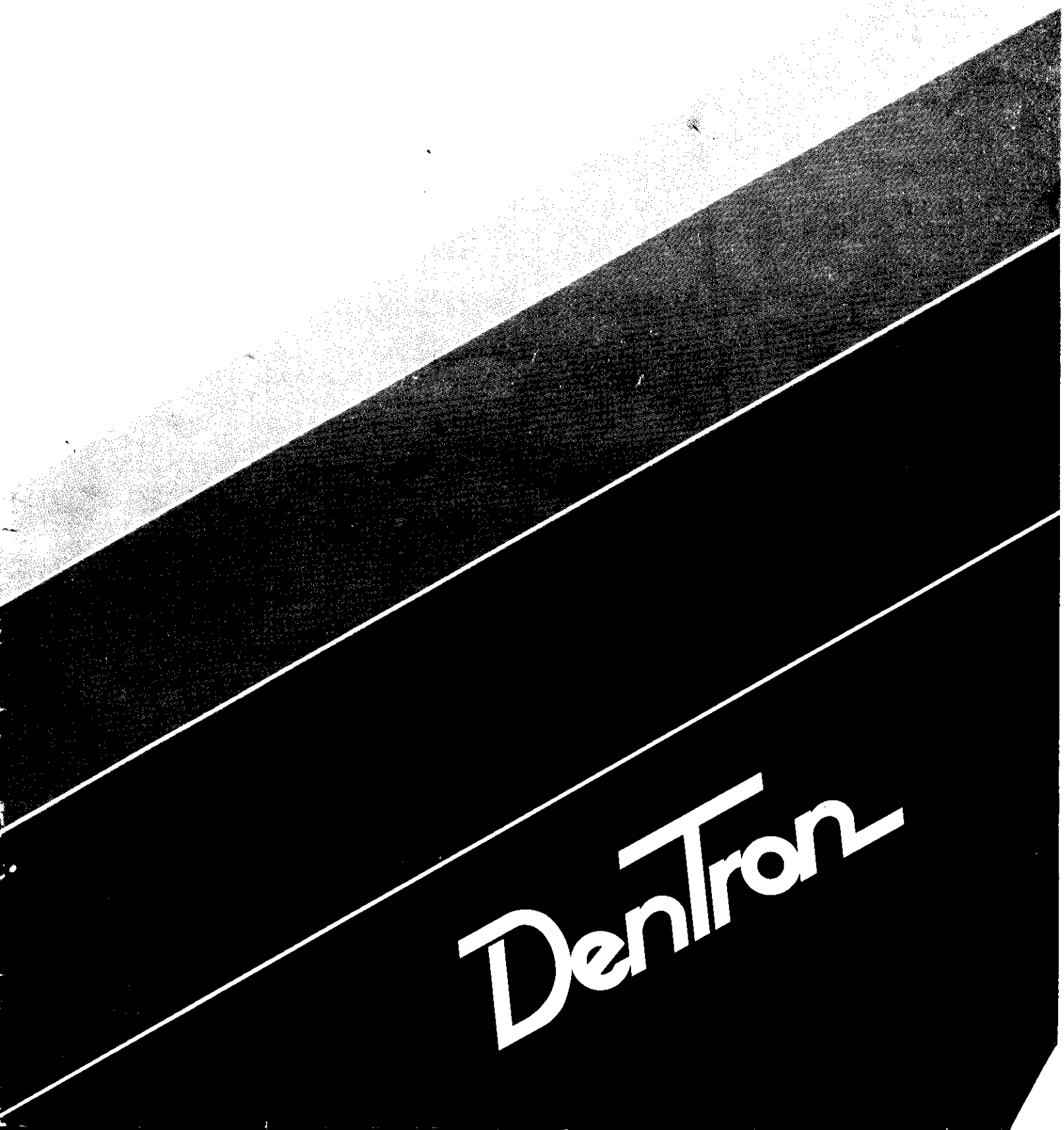
Operating Manual

MLA-1200



Introduction

The MLA-1200 is a compact 1200 Watt PEP 80-10 meter amplifier of modern design. The unit has been designed to adapt to a variety of operating environments, from portable operation to mobile use. The use of separate, outboard power supplies affords the user the option of removing the amplifier from its power supply, thus taking up as little space as necessary at the operating position. In mobile use, the supply can be stowed under the hood, in the engine compartment, or in the trunk, to minimize under-dash space use. The MLA-1200 uses many of the same advanced design techniques found in the MLA-2500 linear amplifier. The use of a single Eimac 8875, for example, allows extended separation between power supply and amplifier, and also calls for a minimum amount of drive to produce the U.S. legal limit of 1 KW input. Tuning the MLA-1200 is a simple process, since the unit is designed for long-term stability in virtually any operating situation. Standard ALC and relay switching circuitry makes the MLA-1200 compatible with most any HF transceiver or transmitter operating in the range 3.5 to 30 MHz. Modern styling completes the compact package.

!! Warning !!

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MLA-1200 Specifications

SSB	1200 Watts PEP Input
CW	1000 Watts DC Input
Maximum Drive Input (Exciter)	150 Watts
Third-order Distortion	Down at least 30 db
Harmonic Attenuation	Exceeds FCC RM #20777 (40 db min.) Tests as high as 65 db, depending on exciter used.
Power Requirements	AC-1200, DC-1200, or homebrew power supply (Contact DenTron for construction details)
MLA-1200	
B+	2250 V DC
Filaments	6.3 V AC
ALC	125 V DC
Control	12 V DC
Cooling Fan	110 V AC
AC-1200	
110 V AC 15 A	
220 V AC 7.5 A	
ALC output	external
Keying	external
Size	MLA-1200 5¼ x 10 x 10 12½ lbs. AC-1200 7¾ x 5½ x 14½ 26 lbs.

Unpacking Instructions

Carefully remove your MLA-1200 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 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. Next, follow the same instructions listed above in unpacking your AC-1200 or DC-1200 power supply.

In general, the location of your new MLA-1200 and matching supply is not critical. Be certain, however, to leave enough room behind the MLA-1200 to allow for proper air flow over and under the unit, as well as behind it. Placement of the AC-1200 or DC-1200 power supply is likewise non-critical, as long as adequate cooling space is provided.

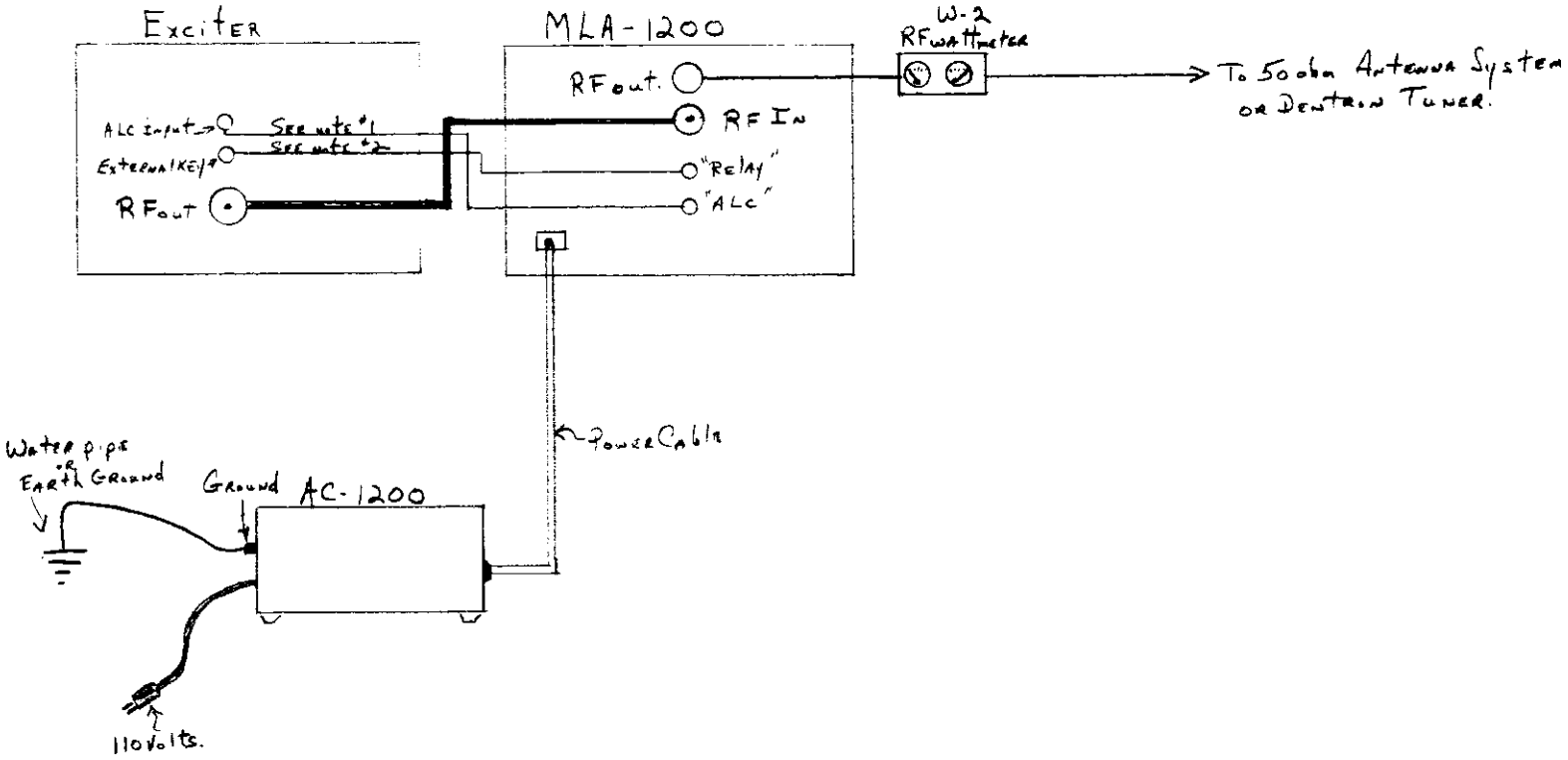
Installation

A careful and complete installation will save wasted time in the future searching for problems that could have been eliminated in the beginning.

Locate the power cable running from the power supply. Carefully plug this cable into the rear panel of the MLA-1200 amplifier.. Then install another 52 ohm coax cable from the amplifier output to a suitable antenna system (DenTron W-2 Wattmeter, DenTron antenna tuner, or DenTron Big Dummy dummy load). Next, install a short length of 52 ohm coax from exciter output to amplifier RF input. Hook a cable from the relay jack on the MLA-1200 rear panel to the relay connections on your exciter. Be certain the exciter offers normally open contacts on receive. Using a similar cable, connect the ALC output from the rear of the MLA-1200 to the ALC input on the rear panel of your exciter (See your exciter manual).

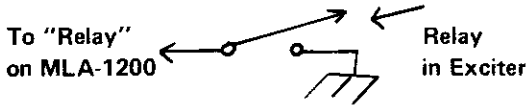
Next, bond all station equipment, including the MLA-1200, to a good ground (water pipe, ground rod, or equivalent), including the AC-1200 or DC-1200 power supply. A good ground is essential to the safe and efficient operation of your new amplifier. See ARRL Handbook or William Orr's Radio Handbook for further details on good grounding and safety practices.

Chart C



NOTES

1. See Exciter Owner's Manual for ALC hook-up.
2. For relay hook-up, the MLA-1200 requires closed contacts to ground.



DIAL SETTINGS (50 ohm load)

	Tune	Load
80 Mtrs.	3.5	5
40 Mtrs.	7.0	4
20 Mtrs.	14.0	5
15 Mtrs.	21.0	7
10 Mtrs.	28.0	8

Operation of the MLA-1200

Operating the MLA-1200 is an easy task, requiring a minimum of steps and fine tuning. The unit is designed for easy operation, and after familiarizing yourself with the following instructions, you should find operation of your new amplifier simple and rewarding.

Preset Controls:	**Power Switch**	**OFF**
	Standby/Operate	**STANDBY**
	Meter Switch	**VOLTS**

AC Operation

Plug your power supply into a 110 V AC (15A) circuit. For 220 V AC operation see Diagram A. Turn amplifier on. Fan will rotate and power switch will light. High voltage indication should be about 2250 DC Volts. Allow approximately 1 minute for ready light to come on. Tune your exciter in the normal manner for your desired operating frequency.

Preset Controls:	**Band Selector**	**Desired Band**
	Standby Switch	**Operate (meter lamps will light indicating Amplifier in operate function.)**
	Meter Switch	**Volts (should read approximately 2250 Volts)**
	Tune Control	**See Chart D for approximate setting**
	Load Control	**See Chart D for approximate setting**

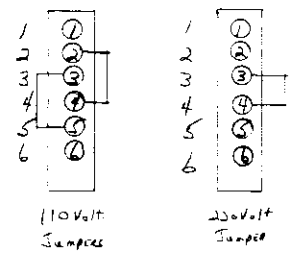
Next, place the meter switch in the Current Position. When exciter is keyed, the amplifier should also key, and with no drive from your exciter, plate current on the MLA-1200 should read approximately 50 MA.

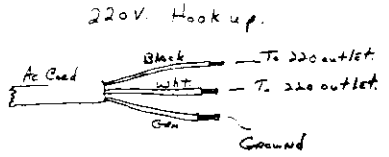
Apply a small amount of drive power to the MLA-1200 until plate current registers a minimal amount up-scale. Adjust both plate and tuning for maximum output on an external RF Wattmeter (DenTron W-2) or switch to RF output on meter switch.

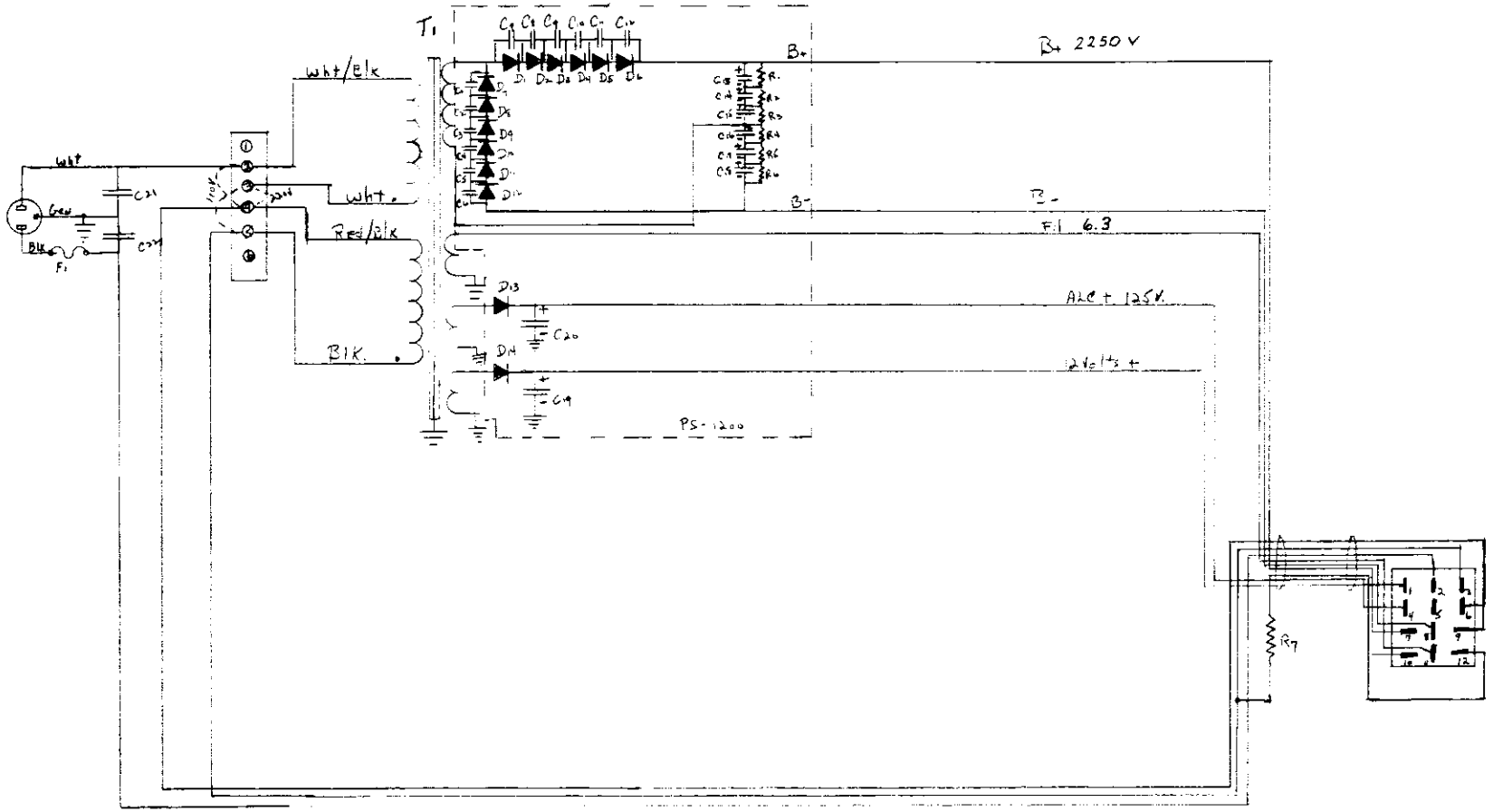
Chart A

AC-1200 PARTS LIST

T1	Transformer
D1 through D14	IN5062 Diodes
C1,through C12, C21, C22	.01 1 KV Disc
C13 through C18	150 mfd, 450 V Electrolytic
R1 through R6	100 K 2 Watt Carbon
R7	380 Ohm 25 Watt
C19	600 mfd - 25 W V.D.C.
C20	100 mfd, 250 V.D.C.
F1	15 Amp Slo Blow







Terminals
- #1 12 Volts DC+
- #2 Switch #1
- #3 Switch #2
- #4 ALC Volts DC+
- #5 NC.
- #6 Switch #3
- #7 B+
- #8 B-
- #9 FAN
- #10 Gnd.
- #11 Filaments
- #12 FAN

Dentron Radio Co.		
SCALE: 1:1	APPROVED BY	DRAWN BY C.D
DATE: 8-17-77		REVISED
AC-1200 AC Supply		DRAWING NUMBER

!! Warning !!

DO NOT EXCEED 500 MILS DURING TUNEUP FOR MORE THAN 2 MINUTES.

Apply full drive (not more than 150 Watts) and repeat the above steps until maximum output is achieved. Your RF Wattmeter should read approximately 500 to 600 Watts output.

SSB Operation

The amplifier can be tuned for maximum output using full drive. Tune both load and tune controls very rapidly for maximum output. You should draw between 500 - 600 mils or better.

Switch meter to relative output. A rear panel potentiometer is provided for adjustment of the relative power indicator. With your exciter keyed, and amplifier tuned for maximum output (continuous carrier), adjust the relative power output for a full scale reading on the front panel meter. Switch exciter to SSB operation. Average talk readings should be approximately one third to one half relative output in key down condition. Plate current peaks should be approximately 200 to 300 mils. If readings exceed one half to one third the relative output scale, reduce your mike gain or flattopping can result.

NOTE: VARYING SWR'S CHANGE RELATIVE OUTPUT ADJUSTMENTS UNLESS DENTRON ANTENNA TUNER IS USED.

CW Operation

Refer back to tune-up procedure. CW operation of the MLA-1200 should not exceed 1 KW input. This can be computed by using the power formula P = EXI + Drive Power, where P = Power, E = Plate Voltage under load, and I = Plate current with drive.

EXAMPLE: 2000 Volts x 500 Mils = 1000 Watts + 100 Watts Drive = 1100 Watts DC Input.

Theory of Operation

Drive to the Amplifier is automatically controlled by a swamping network R1. During idle mode R2 keeps the cathode of the final tube at high positive, keeping the tube shut off during standby. During transmit K1 operates, with the cathode brought to 8.2 Volts positive through Zener D1, thus "Zero Biasing."

The input signal is then fed through C1, C2 and swamped by R1 into the 8875 cathode. The input signal then is sampled through RFC6 to ALC circuit, where a negative going DC pulse is derived. B+ is measured through a combination of R6, R7, R8, and R9 to ground. Plate current is monitored through a factory-selected current shunt. Relative output is obtained through R13, R4, D2, C2, and R5. The output signal from the 8875 is coupled to the output through a high efficiency, pi-network tuning circuit, through RFC 3, C15, C3, C4, L1, L2, C5 and C6.

Troubleshooting the MLA-1200

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1. If failure occurs, check for B+ voltage on front panel meter (should be 2250 V).
2. Check Cathode fuse at rear of amplifier (2A Slo Blow).
3. Check Power Supply Fuse.
4. If drive is applied but no increase in plate current is observed, with 2250 V B+ present, check R14, R15 to be defective. These are safety resistors in case of tube failure or mistuning. Also check exciter keying so that K1 is energized on transmit.
5. If ready lamp does not light, possible time delay tube defect or ready lamp defect.
6. If no cooling fan operation, check R7 in AC-1200 or DC-1200.
7. If plug-in metering & ALC board needs to be inspected, remove in the following manner. First, discharge the filter capacitors in the power supply unit. Then carefully remove the card from the socket, slowly pulling the board upwards until it is partially clear. Then remove the B+ wire, which is connected to the board through a small pin plug and jack.

!! Warning !!

NEVER OPERATE MLA-1200, AC-1200, DC-1200 OUTSIDE OF ITS CABINET!!

Troubleshooting the AC-1200 & DC-1200

!! Warning !!

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1. If no plate voltage on MLA-1200, disconnect the supply from your power source and allow one half hour for discharge of high voltages in electrolytic capacitors.
2. Check for defective diodes D1 through D12 in AC-1200, or DC-1200 check for possible short in capacitors C13 through C18.
3. If no ALC voltage present, check D13 and C20.
4. If no 12 V DC, check D14 or C19.
5. In case of difficulty, contact DenTron Radio Company for assistance.

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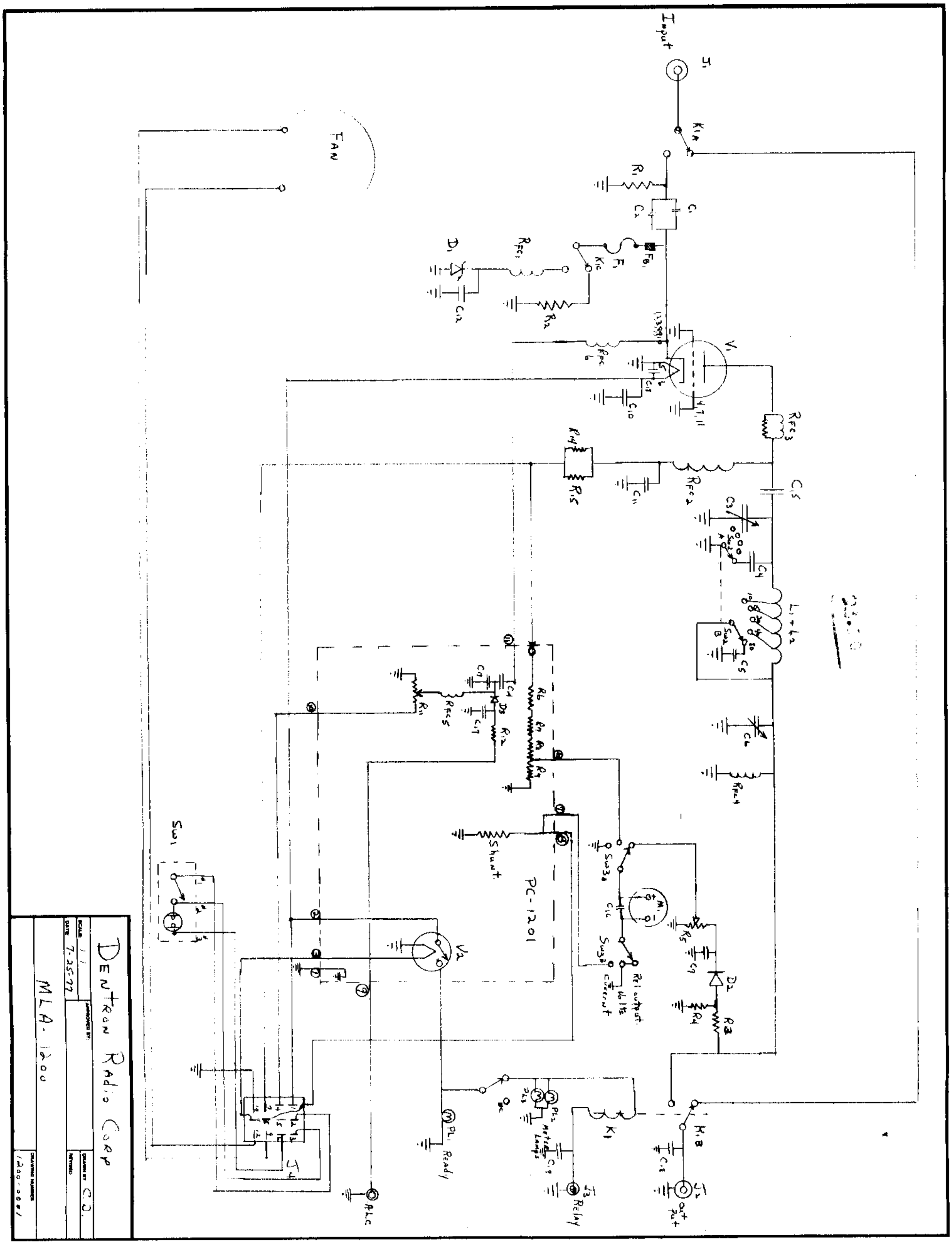
WARNING: Loosen screw on tube clamp before removing tube.

Chart B



Dentron Radio Corp
MLA-1200
7-25-77
PC-1201
Input
Fan
Shunt
Relay
ALC

PART NO.	MLA-1200 AMP PARTS LIST
CAPACITORS	
C1, C2, C10, C7, C12, C13, C16, C18, C19	.01 mfd, 1 KV Disc
C11	500 pfd, 6 KV Disc
C5, C15	1000 pfd, 5 KV, Door Knob
C3	140 pfd, Variable
C4	100 pfd, 5 KV, Door Knob
C6	800 pfd, Variable
C14, C17	47 pfd, S.M. Cap
RESISTORS	
R1	100 Ohm, 50 Watt, Non-inductive
R2	47K, 2 Watt Carbon
R4	1 K ½ Watt Carbon
R5	100 K Pot.
R6, R7, R8	1 meg. 1 Watt 1%
R9	100 K 2 Watt Carbon
R10	Meter Shunt
R11	100 K Shunt
R12	27 K 2 Watt Carbon
R13	27 K ½ Watt Carbon
R14, R15	1 Ohm, 1 Watt
TUBES, JACK, & MISC.	
FB1	Ferrite Bead
V1	8875 Tube
V2	Time Delay Tube
J1, J2	SO-239 Connector
J3, J4	RCA Phono Recep.
SWITCHES & COILS	
SW1	On-Off Switch
SW2	Band Switch
SW3	Volt, Current, Output Switch
SW2	Standby Switch
L1	Tank Coil (80 & 40 Mtr)
L2	Tank Coil (20, 15, 10)
RFC4, RFC5	2.5 Mit Chokes
RF3	Parasitic Choke
RFC1, RFC6	8 uh Choke
MISCELLANEOUS	
Fan	Fan
M1	(0-1 MA) Volt, Current, Output Meter
PL1	#330 Bulb Ready Light
PL2, PL3	#386 Bulb Meter Light
K1	12 Volt Relay (3 PDT)
D1	8.2 Volt Zener
D2	IN295 Diode (IN6263)
D3	IN5062 Diode
AC-1200 PARTS LIST	
T1	Transformer
D1 through D14	IN5062 Diodes
C1,through C12, C21, C22	.01 1 KV Disc
C13 through C18	150 mfd, 450 V Electrolytic
R1 through R6	100 K 2 Watt Carbon
R7	380 Ohm 25 Watt
C19	600 mfd - 25 W V.D.C.
C20	100 mfd, 250 V.D.C.
F1	15 Amp Slo Blow

Limited 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., 2100 Enterprise Parkway, Twinsburg, Ohio 44087.

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.

DenTron
Radio Co., Inc

2100 Enterprise Parkway
Twinsburg, Ohio 44087
(216) 425-3173