

# **Operating Manual**

## **GLA-1000B**

The logo for Dentron, featuring the word "Dentron" in a white, stylized, sans-serif font. The letters are slightly slanted to the right. The logo is positioned on a dark blue background that is part of a larger graphic design consisting of several diagonal stripes in shades of blue and purple.





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# Introduction

DenTron Radio Company designed the GLA-1000B with efficiency in mind. Our engineers weren't only concerned with efficiency in terms of power input versus power output, they were also worried about offering an amplifier that is efficient space-wise, and dollar-wise. The result is a compact linear offering 800 Watts CW input and 1200 Watts input PEP SSB, a built-in power supply suitable for 117 or 234V AC mains, complete metering of essential voltages and currents, front panel amplifier bypassing for selection of a dummy load (such as a DenTron Big Dummy) or an alternate antenna system, a relative power output monitor, and modern styling. The GLA-1000B comes equipped with a tilt-up bail to increase air circulation and a super quiet forced air cooling system designed for trouble free operation. The high voltage power supply is all solid state, and there are four final tubes, DenTron D-50A pentodes. (DenTron offers replacement tube kits through its dealers worldwide.)

Input matching circuits make the GLA-1000B compatible with any exciter or transceiver, especially the popular solid state power amplifier units. Rear panel controls allow for relay switching and relative power output sensitivity. A maximum drive figure of 125 Watts is factory specification. Special circuitry required by FCC Type Acceptance regulations limit frequency coverage of the GLA-1000B to 80 through 15 meters, although proper modification by a licensed Amateur will allow 10 meter coverage. Most MARS frequencies just outside the Amateur Bands can be covered without modification.

## Warning

**MAKE NO ATTEMPT TO PUT THE AMPLIFIER IN SERVICE OUTSIDE OF THE CABINET! CONTACT WITH VOLTAGES IN THIS AMPLIFIER CAN BE FATAL!**

## Warning

**BE CERTAIN THAT YOU REMOVE THE INNER PACKAGING ABOVE THE D-50A FINAL TUBES PRIOR TO OPERATION. REMOVE THE TOP COVER ACCORDING TO THE INSTRUCTIONS UNDER SERVICE DATA. IT WILL ALSO BE NECESSARY TO INSTALL THE 15 AMP FUSE (TAPED TO THE GLA-1000B POWER TRANSFORMER) BEFORE INSTALLING THE UNIT.**



# Specifications

- Size: H. 5 3/8" W. 11" D. 11"
- Weight: 24 lbs.
- Electrical Power Consumption: 117 VAC 50/60 Hz 12.5 Amps.  
Factory fused at 15 Amps  
234 VAC 50/60 Hz 7 Amps  
Recommended fuse 10 Amps
- Frequency Coverage:
  - 80 Mtrs: 3.45 to 4.3 MHz
  - 40 Mtrs: 6.950 to 7.5 MHz
  - 20 Mtrs: 13.950 to 14.5 MHz
  - 15 Mtrs: 20.950 to 21.5 MHz
  - 10 Mtrs: With Modification by Licensed Amateur  
(Covers most MARS frequencies just outside the  
Amateur Bands.)
- RF Drive: Maximum 125 Watts
- DC Input: 800W CW and 1200 Watts PEP SSB
- Spurious Emissions: IMD better than 30 dB down  
Harmonics better than 40 dB down
- Components:
  - 4 – D-50A tubes (6LQ6)
  - 6 – Diodes
- FCC Type Accepted

## Warning

TO TAKE FULL ADVANTAGE OF THE GLA-1000B COOLING SYSTEM, IT IS HIGHLY RECOMMENDED THAT THE UNIT BE RAISED UP WITH PROVIDED BAIL UNDER NORMAL OPERATING PROCEDURES.

# Theory of Operation

## Power Section

After your GLA-1000B is hooked up to the AC power source, power is applied to T1 through SW1B in the standby mode, voltage, current and REL. output mode. The GLA-1000B comes operational on 117 volts AC.

To operate the GLA-1000B on 230 volts, it is necessary to change the jumpers on the terminal strip on the back panel. After power has been applied to T1, the first secondary winding has connected to it a full wave bridge rectifier consisting of D2 through D5, D8 through D11, and C17 through C20. This converts the AC voltage to DC voltage. The DC voltage is now filtered by C21 through C23. The DC voltage is metered by the combination of R12, R13 and R14. Approximately 1200 volts DC is applied to the plates of the tubes through RFC6 and RFC2 and through RFC5. DC current is measured across R7.

The second secondary winding of T1 has two functions. First it supplies the non-rectified AC voltage used to light the meter lamps. Secondly, through D6 and C24, the secondary winding provides 12 volts DC which is used to operate the control relay and to power the red transmit led and green standby led on the front panel. The third secondary winding of T1 is used strictly to energize the filaments of the four D50A power amplifier tubes.

## Signal Operation

When the unit is in standby mode, the exciter RF output is fed directly into the RF input terminal of the GLA-1000B, through K1A and K1B bypassing the GLA-1000B input impedance matching network and tube deck, through SW4, and goes out through the selected RF output terminal #1 or #2DL.

Whenever the GLA-1000B is placed in the volts, current or relative output function, the unit becomes operational as an amplifier. Signal now enters at the RF input and goes through K1A to SW3A, through an impedance matching network to SW3B where it is coupled to the cathodes of the D50A's through C1 and C2. The now amplified RF signal from the D50A's is coupled through C11 and tuned by C9, L1, L2, and C10. The amplified signal leaves the GLA-1000B by means of K1B and goes to SW-4 where it is routed out the selected RF output jack.

Relative output is measured through a combination of R9, R10, R11, D7, C26 and is adjusted for meter deflection by R8. RFC7 serves as a safety device in case C11 becomes shorted.



# Cautions

1. Prior to operation, remove the internal packaging material around the D-50A tubes. Remove the top cover according to the Service Data section. Also install fuse taped to the power transformer.
2. Make no attempt to put the GLA-1000B in service outside of the cabinet. Contact with voltages in this amplifier can be fatal to the human body.
3. Never attempt to operate the GLA-1000B with drive power of more than 125 watts!
4. Never attempt to operate the GLA-1000B 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.
5. Never run amplifier from an extension cord.
6. Do not attempt to change jumper connections inside the Amplifier without first removing the power plug from the power source.
7. Do not cover the top of the GLA-1000B with books, papers or other pieces of equipment or overheating may result.
8. Do not use different tuning procedures other than indicated in this manual.
9. When cleaning the GLA-1000B, 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

BE CERTAIN THAT YOU REMOVE THE INNER PACKAGING ABOVE THE D-50A FINAL TUBES PRIOR TO OPERATION. REMOVE THE TOP COVER ACCORDING TO THE INSTRUCTIONS UNDER SERVICE DATA. IT WILL ALSO BE NECESSARY TO INSTALL THE 15 AMP FUSE (TAPED TO THE GLA-1000B POWER TRANSFORMER) BEFORE INSTALLING THE UNIT.

## Warning

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## Unpacking Instructions

Carefully remove your GLA-1000B 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. Be certain to remove the inner packaging. (See Service Data for top cover removal.) Install the 15 amp fuse taped to the power transformer before replacing the top cover.

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

In general the location of your new GLA-1000B is not critical. Be certain, however, to leave enough room behind the unit to allow for proper air flow over and under the unit, as well as behind it.

## Installation

The GLA-1000B is factory wired for 117V AC operation. If 234V AC is desired you will have to rewire the power transformer primary per the schematic diagram. The terminal strip is located in the extreme lower left corner of the inside rear panel when viewing the unit from the front panel side.

1. Position the GLA-1000B so that the rear, sides and top of the unit are clear of all obstructions. This will assure proper air flow. (Placing the unit up on the built-in bail will also aid circulation.)
2. Connect a wattmeter (such as a DenTron W2) and a dummy load (such as a DenTron Big Dummy) to the #2DL RF out connector using RG-8/U cable or its equivalent. The #2DL connector may also be used to feed a second antenna system.
3. Connect a wattmeter (such as a DenTron W2) and antenna system to the #1 RF out connector using RG-8/U or its equivalent.
4. Connect the GLA-1000B keying lead to your transmitter using shielded cable such as RG-174U (See interconnect diagram). The GLA-1000B requires closed contacts to ground on transmit.
5. Connect the rear panel RF IN jack to the transmitter or exciter RF OUT jack using 50 ohm cable such as RG-58U.
6. Connect as short a ground lead as possible from a good earth ground to the unit's rear panel GND terminal.



# Tuning Procedure

## CW

1. Plug the GLA-1000B into a 117V AC power source.
2. Turn FUNCTION switch to STANDBY. Meter will light and cooling fan will start. Meter will read "O".

**ALWAYS ALLOW 3 MINUTES WARM UP TIME BEFORE APPLYING DRIVE POWER TO THE GLA-1000B.**

3. Turn FUNCTION switch to the VOLTS position. The Plate Voltage meter scale should indicate approximately 1100 volts DC.
4. Return the FUNCTION switch to STANDBY. Tune your exciter in the CW mode for maximum output as stated in your Owner's Manual.

### Warning

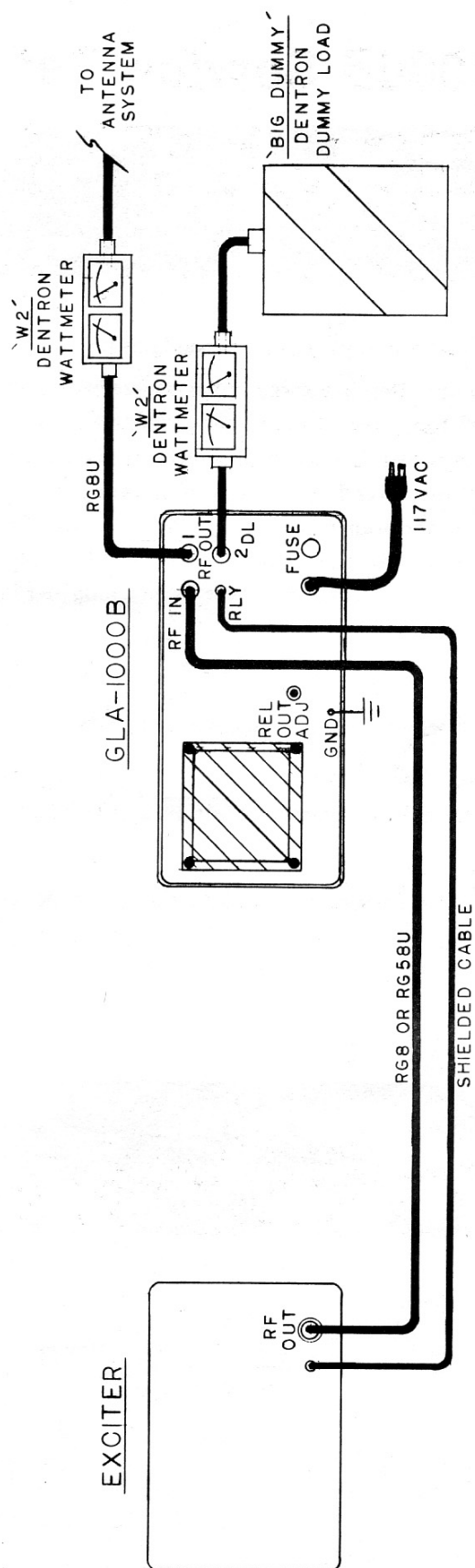
**BEFORE CONTINUING, NEVER KEEP THE GLA-1000B KEYED FOR LONGER THAN 15 SECONDS AT A TIME AND ALLOW EQUAL COOL DOWN TIME.**

5. Reduce CW output using the carrier or CW level control on your exciter. Unkey your exciter.
6. Preset the GLA-1000B TUNE and hand controls for the desired frequency band; also set the GLA-1000B BAND SELECTOR for the proper frequency. (Load control for 80 and 40 preset at "3". 20 and 15 preset at "5").
7. Rotate the GLA-1000B FUNCTION switch to the CURRENT position. Key your exciter and begin to increase the CW carrier level until reaching approximately 400 MA on the GLA-1000B Plate Current meter scale. Very rapidly, turn the TUNE and LOAD controls for maximum output on your watt-meter. Continue to increase the exciter CW carrier level until maximum output is reached (approximately .800 Amps x 1000 Volts = 800 Watts CW or approximately 1250 Watts PEP in SSB Mode).

## SSB

1. Turn FUNCTION switch to REL. OUT. Re-Key your exciter to full output as described under CW and adjust the SENS control (Knurled shaft on rear panel) for full meter scale deflection on the GLA-1000B meter.
2. Set your exciter for either sideband and adjust your mike gain control for approximately one-half scale on voice peaks, with GLA-1000B in REL. OUTPUT position. This will insure proper operation by limiting drive to maximum talk power.

# GLA-1000B Connection Diagram





# GLA-1000B Service Data

## Warning

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**Tube Replacement:** Allow 15 minutes with unit off before procedures below.

Remove unit from AC power source. Remove three upper screws on cabinet top right side and three screws on upper right side and one on top. This allows upper cover to be removed. Use an insulated screw driver and go from one of the plate caps of tubes to ground holding plastic part of screw driver. This will insure that plate voltage is completely discharged. Remove four plate caps of tubes carefully, being careful not to break parasitic chokes. Remove the four tubes and replace with DenTron D-50A's. These may be purchased from DenTron or any DenTron Dealer. Be careful to plug tubes into tube sockets and not bend any of the pins. Replace plate caps on tubes. Replace cover before plugging unit back into AC to avoid hazardous shocks.

**Bulb Replacement:**

Remove top cover. (See tube replacement section). Bulbs are held into rear of meter.

Meter Lamps: Remove top cover. (See tube replacement section). Bulbs are held into rear of meter by two swinging tabs. These are raised to a semi-vertical position and bulbs are slid out of sockets. Bulbs resemble a 22 caliber bullet cartridge.

New bulbs are then inserted and arms are swung down over center contact of bulb.

## Warning

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





# GLA-1000B Parts List

|  |                          |
|--|--------------------------|
| <b>CAPACITORS:</b>   |                          |
| C1, C2, C26  | .001 1KV Disc            |
| C3, C4, C5, C6, C7, C8, C13, C15,<br>C16, C17, C18, C19, C20, C25, C35 | .01 1 KV Disc            |
| C9   | D-232-45 Variable        |
| C10  | D-5854 Variable          |
| C11  | 1000pf 6KV Door Knob     |
| C21, C22, C23  | 100ufd 500WVElectrolytic |
| C24  | 500ufd 50WV Electrolytic |
| C27  | 150pf Silver Mica        |
| C28  | 5pf Silver Mica          |
| C29  | 330pf Silver Mica        |
| C30  | 150pf Silver Mica        |
| C31  | 680pf Silver Mica        |
| C32  | 510pf Silver Mica        |
| C33  | 1730pf Silver Mica       |
| C34  | 1100pf Silver Mica       |
| <b>RESISTORS:</b>  |                          |
| R1, R16  | 330 1/2 watt carbon      |
| R3   | 380 ohm 10 watt          |
| R4, R5, R6, R14  | 100K 2 watt carbon       |
| R7   | Meter shunt              |
| R8   | 10K Pot (REL OUT)        |
| R9   | 27K 1/2 watt carbon      |
| R10  | 10K 1/2 watt carbon      |
| R11  | 33K 1/2 watt carbon      |
| R12, R13   | 750K 1 W 1% wire wound   |
| R15  | 1K 1/2 watt carbon       |
| <b>DIODES:</b>   |                          |
| D1   | IN3321 Zener             |
| D2, D3, D4, D5, D8, D9, D10, D11                                       | 1500V Amp                |
| D6   | IN4007                   |
| D7   | IN295                    |
| <b>CHOKES:</b>   |                          |
| RFC-1  | 8.5uhy                   |
| RFC-2, 3, 4, 5   | Parasitic chokes         |
| RFC-6  | Plate choke              |
| RFC-7  | 2.5mhy                   |
| <b>TUBES:</b>  |                          |
| V1, 2, 3, 4  | D-50A                    |
| <b>COILS:</b>  |                          |
| L1   | Secondary tank coil      |
| L2   | Tank coil                |
| L3   | .3uhy                    |
| L4   | .6uhy                    |
| L5   | 1.3uhy                   |
| L6   | 2.5uhy                   |

|            |  |
|------------|--|
| SWITCHES:  |  |
| SW1A, B, C | Function   |
| SW2        | Band   |
| SW3A, B    | Input Impedance Match  |
| SW4        | Antenna  |
| RELAY:     |  |
| K1A, B     | 2PDT   |
| LED'S:     |  |
| Led 1      | Red - Xmit status  |
| Led 2      | Green - Stby status  |
| MISC.:     |  |
| M1         | Panel meter  |
| F1         | 15 Amp   |
| PL1, 2     | 12V Bulbs (382)  |
| Fan        | 117Vac 75 CFM  |
| T1         | Power Transformer<br>Primary: 117/234 VAC 50/60HZ<br>Sec.: 800V, 12V, 6.3VAC 50/60HZ |

**Dentron**



# 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.,**

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<sup>®</sup>**  
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