

CQ Reviews:

The Dentron MLA-2500

Linear Amplifier

BY HUGH R. PAUL*, W6POK

Over the years many amateur operators have approached the purchase of a new linear amplifier with the philosophy that "big is better." If the amplifier stood three feet off the floor and required two men and a boy to maneuver it into position next to the operating position, it was considered a reliable "power house." Until recently there was some justification for that philosophy; then along came the new Dentron MLA-2500 linear amplifier.

The MLA-2500 covers all bands from 160 meters through 10 meters, and is rated at 2000+ watts p.e.p. on s.s.b. and 1000 watts d.c. input on c.w. with a continuous duty cycle. The real grabber is its size—only 5½" high, 14" wide and 14" deep. Half of its 47-pound weight is composed of the power transformer.

Dentron has given special consideration to MARS operators and the possibility of band expansion after WARC 79 by designing in extended tuning ranges for the 80, 40, 20 and 15 meter segments. The amplifier will cover 3.4 to 4.6 MHz, 6.0 to 9.0 MHz, 11.0 to 16.0 MHz and 16.0 MHz to 22.0 MHz.

Other design features include a time delay relay to allow full warmup of the tubes before drive can be applied and a thermal switch that senses a 10 degree increase above normal operating temperature of the Eimac 8875 triodes. When the switch cuts in, the Rotron fan operates at high speed to increase air flow, thus maintaining tube temperature at a safe level. At high speed the fan is a bit noisy, but other stations reported hearing it only during pauses in speech.

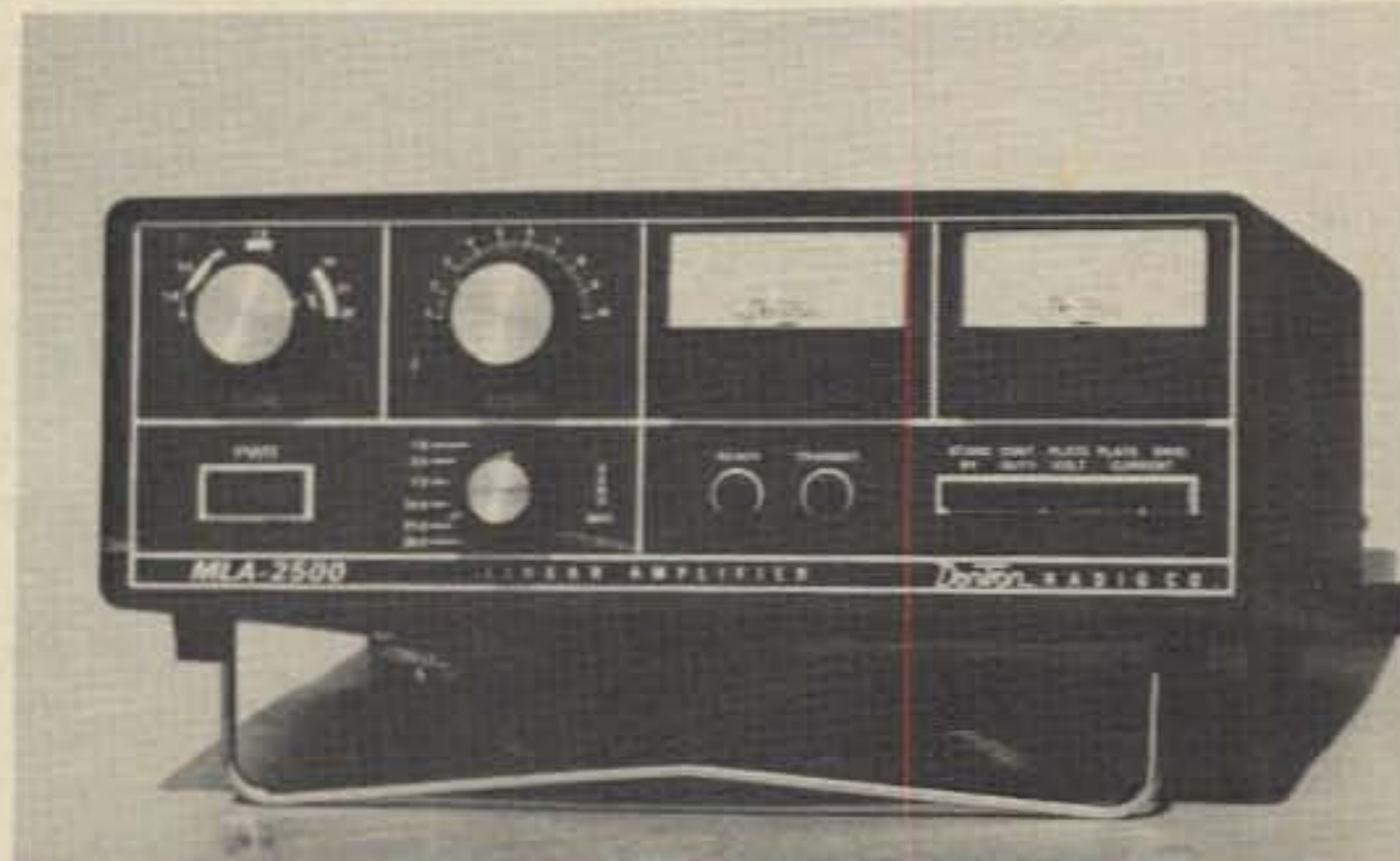
The Eimac 8875 ceramic triodes are rugged little tubes, but as with all tubes with external anodes their dissipation rating is dependent primarily on

the amount of air circulating past the cooling fans. At the power levels the MLA-2500 is capable of, a lot of air is necessary if long tube life is to be achieved.

The main power switch is an illuminated type that glows red when primary power has been applied. A green "ready" light indicates that the tube filaments have reached proper operating temperature. The time delay is about one minute. The transmit condition is indicated by a second red indicator light just to the right of the "ready" light.

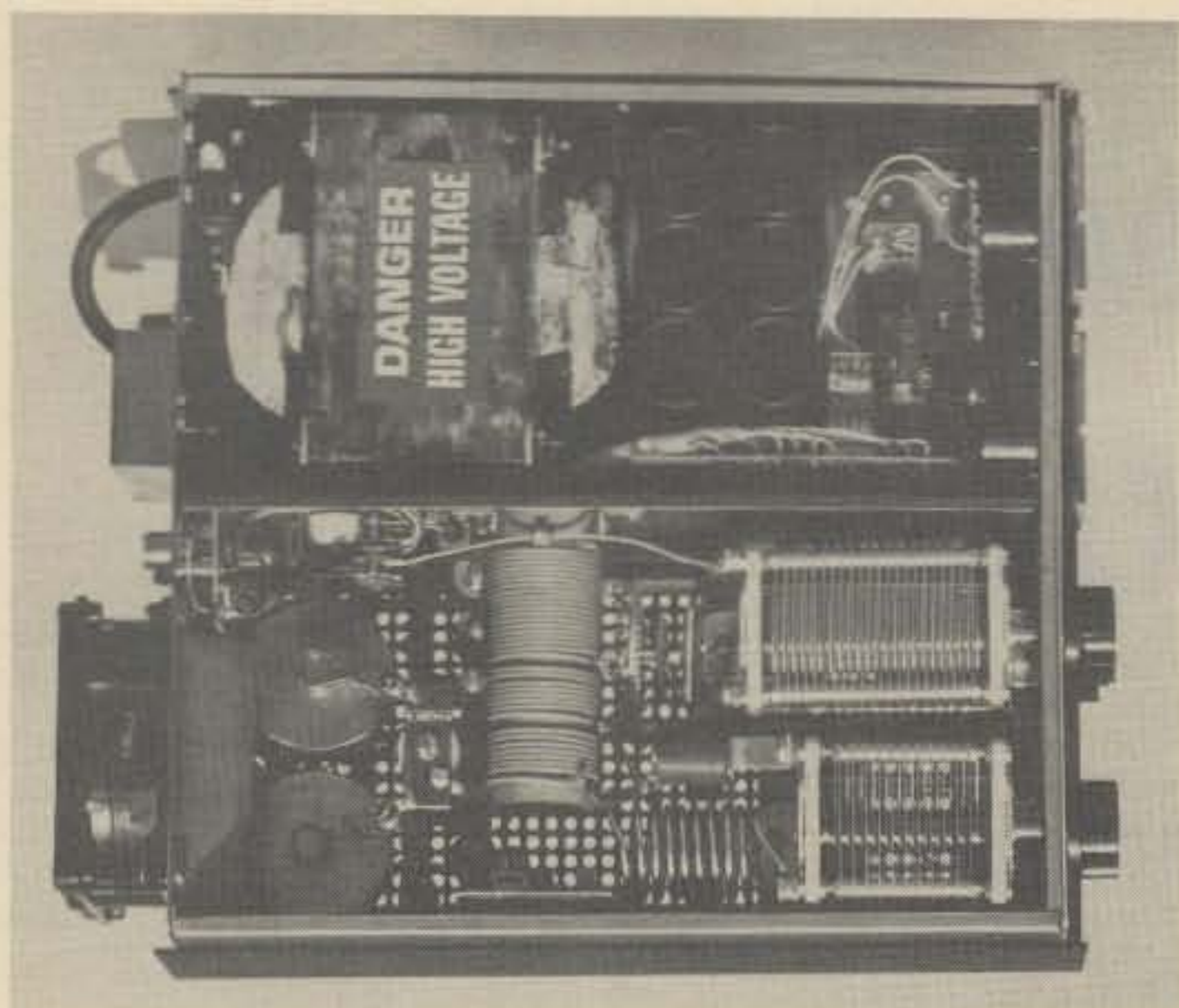
The meter on the right reads plate voltage, plate current and grid current as selected by push button switches located directly below the meter. Additional push type switches place the amplifier in a stand-by mode when one desires to use only the exciter and to bypass the thermal switch and place the blower on high speed at all times when operating RTTY or slow scan TV.

The meter to the left reads RF Watts output. The accuracy is within plus or minus 10% at the higher



Front view of the Dentron MLA-2500 linear amplifier.
(Photo by Sandra R. Paul)

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Interior view of the MLA-2500 linear amplifier. (Photo by Sandra R. Paul)

power levels, provided the s.w.r. is low. At higher s.w.r. levels or at lower power levels the accuracy can vary by as much as plus or minus 25%. In most cases the r.f. wattmeter was reading low when compared to a Bird thru-line wattmeter. The power measuring circuitry has adjustment which will allow you to calibrate the output indication against a standard such as a Bird.

The components used in the MLA-2500 have been selected to provide good safety margins with regard to power ratings, etc. The large inductor visible in the interior photograph is made by Dentron and is teflon coated. The variable capacitors are heavy duty transmitting types. The final PI network has been carefully designed with enough fixed capacity inserted where required, that the output is at a nominal 50 ohms impedance with the variable loading control at the #1 position. Only slight tuning of the variable loading control is required to achieve full output on each band. The result is that you won't experience arc overs during the tuning process. The final is capable of loading impedances of as much as 100 ohms. With 52 ohm coax and a v.s.w.r. of 2 to 1 or less, tuning the amplifier is a "piece of cake."

During lab testing of the MLA-2500 we found that 1 k.w. d.c. input could be achieved with from 35 to 40 watts of drive applied. Efficiency at 1 k.w. input averaged 62% across the various bands. At 2 k.w. d.c. input the efficiency increased to an average of 66%. These efficiency factors were calculated after subtracting the drive power, which averaged about 95 watts at maximum input. Maximum d.c. input power achieved with 220 v.a.c. applied to the primary of the power transformer, and with 95 watts of drive power was just over 2200 watts.

Dentron rates their amplifier at 1 k.w. d.c. input on a continuous duty basis. I'm sure that by continuous duty they mean hour after hour operation. We ran the unit under test at 1 k.w. d.c. OUTPUT for extended periods of time with no ill effects. The power transformer is extremely rugged and does not overheat like those used in many table top amplifiers.

Dentron recommends that the amplifier be operated from a 234 v.a.c. primary circuit, but it can also be operated from a 117 v.a.c. circuit by merely switching a jumper and adding a second jumper on a barrier strip located behind a protective cover on the back of the amplifier. At my home QTH I don't have 234 v.a.c. in the shack so "on the air" tests were made while operating on 117 v.a.c. primary power. High voltage regulation is not as good as it was with 220 v.a.c. in the lab, but I was still able to load the amplifier to almost 1.9 k.w. d.c. input. I might add that I have a separate 30 amp. service without any other load on it just for this purpose. I would not nor would your insurance company recommend using a standard lighting circuit for powering this amplifier.

The final test of a linear amplifier is not just how much power it will put out, but how clean is the output. This is especially true in light of the new FCC regulations concerning spurious emissions. The Dentron MLA-2500 is clean if the transmitter used to drive it is clean. Dentron claims third order products at least 30 db down. My TS-520 has third order products just under 30 db down from the single tone of a two tone test and that's what we found when looking at the output of the amplifier with a spectrum analyzer. The second harmonic was about 43 db down.

Performance of the a.i.c. circuitry in the MLA-2500 is excellent. Adjustment procedure for this circuit is outlined briefly in the owner's manual in case you should have some difficulty with a particular exciter. No adjustment was required for use with the TS-520 and it required a deliberate effort to overdrive the amplifier and achieve flattopping.

The instruction book is fairly good, but did lack some basic information such as how much grid current you should read under normal operating conditions (about 50 ma at full load). A few more details concerning the control circuitry could prove helpful in the event of trouble in this area. In the photograph you can see a wire bail that serves to elevate the front of the amplifier. This bail is a flip up type, which the manufacturer recommends you use to insure maximum flow of cooling air underneath the unit.

The Dentron MLA-2500 has been designed and built with integrity. The MLA-2500 is priced at \$799.50. It represents good dollar value in today's market. For more information contact Dentron Radio Co., Inc., 2100 Enterprise Parkway, Twinsburg, Ohio 44087. ■