Attention:

The use of Linear Amplifiers are controlled by specific laws within the country of use. These laws must be known to the user and are entirely the responsibility of the user. The manufacturer declines any responsibility from unlawful use.

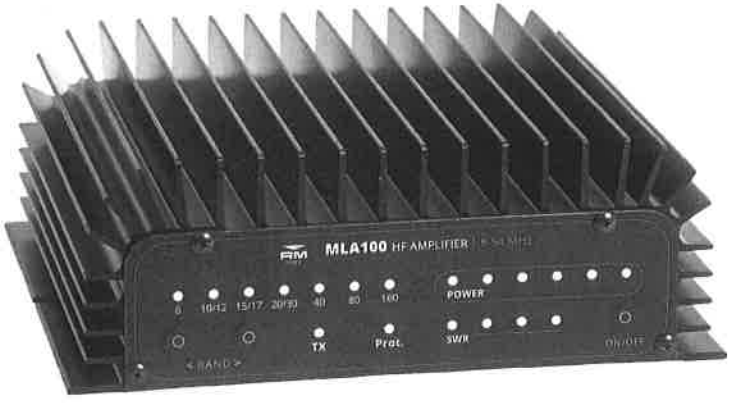
Warranty:

This product is covered by a 24 month warranty commencing from the date of purchase. The original purchase receipt will be required for any claim. This warranty does not cover aesthetic damage or damage to the RF power transistors from incorrect use.

www.rmitaly.com **e-mail: Info@RMItaly.com**

MLA100

HF & 6m Linear Amplifier



Ver 1.0 May 2018

Specifications:

Operation Frequency:	1.8—30 MHz & 50—54 MHz
Modulation Types:	SSB,CW,AM, FM, data etc (All narrowband modes)
Transistor:	2x Mitsubishi RD100HHF1
Max I/P Current:	16A
Power Supply:	13VDC+/- 1V 25A
Input Fuse	1x20A
Input RF Power:	1-10W max (All modes)
Output RF Power:	100W max HF 80W 6m
Maximum bypass power (Amplifier off):	50W max
Input VSWR:	1.1—1.8:1
Output VSWR Maximum:	2.5:1
Harmonic Output:	>-50dBc 1.8-30MHz & >-60dBc 50-54 MHz

WARNING: Before using this product please read carefully all o the information in this manual or at least the quick start guide!!! To avoid dam age or incorrect operation this is extremely important!!!

Quick Start Guide:

A more complete guide to the installation is featured later

Connect the RTX input connector ⓫ to transceiver with 50 Ohm patch cable

Connect the ANT Output ⓬ of the Amplifier to ATU / VSWR Bridge, (If required), and then the Antenna (50 Ohm load Impedance)

Connect the PTT cable from the transceiver to the amplifier. PTT is Active low. (The MLA100 will work without the PTT connected but it is recommend to use it for CW and SSB modes).

Connect the DC power Cable to the amplifier ⓭ to a suitable 13VDC (± 1V) Power Supply or Auto Battery. Pay attention to the correct polarity

Make sure that the amplifier is switched off ❶

Adjust the Transceivers RF output power to 5W, if it is capable of more than 5W output.

Test that the antenna connected is suitable for the band required, if not use an ATU to match the antenna with the amplifier switched off.

Switch on the Amplifier, press and hold ❶ 2 secs.

The amplifier will automatically select the correct band filter on the first transmission.

Front / Rear Panel Description

Front Panel

1. Amplifier ON / OFF switch
2. VSWR LED display
3. Protection LED indicator
4. TX indicator LED
5. Manual band filter select down
6. Manual band filter select up
7. Active band filter indicator
8. Output power indicator 0-100%

Rear Panel

9. 13.5V DC Power supply input connector (Polarity marked on rear panel)
10. 20A Input Fuse, Blade / Auto type
11. RTX Input SO239 connector (Connect to transceiver)
12. PTT input RCA/PHONO connector. Active low, (ground to switch amplifer to transmit)
13. Antenna SO239 Connector , Connect to suitable antenna or ATU / Antenna

ıtroduction:

ıe MLA100 is a wideband HF & 6m amplifier capable of 100W HF, (80W 6m), output from
V input drive, suitable for any of today's QRP transceivers. It features automatic / manual
ınd selection, rapid switching between receive and transmit by PIN diode RF switching,
aking it suitable for all modes of narrow band modulation and QSK operation. Both output
›wer and antenna VSWR are displayed on the front panel by dual LED bar graph displays.
ıe amplifier is protected against excessive temperature, antenna VSWR and input overdrive.

ıstallation:

ıpack the amplifier from it's shipping carton and inspect for any signs of damage. The ampli-
:r should be installed (base or mobile installation), in a place that allows good ventilation and
ovides a suitable base to support it. Failure to allow for reasonable ventilation will cause the
ıplifier to overheat and shutdown prematurely. A short 50 Ohm patch lead should be used to
ınnect the amplifiers RTX SO239 input ⓫ connector to the output, (Antenna socket), of the
ransceiver. This length of this cable is not critical but should be of good quality and be kept as
ort as practically possible. The ANT output ⓯ connector of the amplifier should then be con-
:cted to the antenna being used. (If an external ATU/SWR/Power meter is required, the ampli-
:r should be connected to the input and then the antenna to the output of this device, This or-
:r of connection is very important. Check also that the Antenna is suitably rated for the power
ıtput level. (Antenna SWR should not change much from low to high power). The antenna
ould be tuned before switching on the power amplifier. In SSB / CW mode the PTT input ❾
ould be connected to the transceiver PTT output . This ensures that there is minimum delay
ıen the transceiver is put into TX. For transceivers without a PTT output the amplifier will
ll function correctly however there will be some additional delay as the amplifier will only
vitch to TX when there is RF present on the input. There is a predetermined delay, (0.5-1S),
t for SSB, so that the amplifier remains in TX between pauses in speech.

ıe amplifier must be connected via the input power connector ❷ to a suitable power supply of
e correct voltage output and sufficient current rating. The output should be between 13.5 or
.8V DC but the amplifier may be connected to a supply from 12V to 14V DC without dam-
ge. The current rating of the power supply must be at least 25A continuous. Be aware that the
ırrent rating must be greater still if the drive radio is also connected to the same power supply,
though this is not generally advised.
ıe voltage output and current rating are very important for low voltage (12V) RF transistors as
›ltage sag, (poor load regulation) or insufficient current capability can drastically reduce the
ıtput power or cause distortion. If full output is not seen then the first thing to check is that the
›ltage remains above 12.5V at full load. Anything less indicates the power supply is not suit-
›le for the amplifier at full output.
ıe cross sectional area of the cables used to connect the amplifier to the PSU should not be
ss than 6mm^2 or 10 AWG. They should also be kept as short as practicably possible to avoid
›ltage drop due to ohmic losses. This is less of a problem in a fixed installation where the
›wer supply may be placed close to the amplifier.

For a mobile installation the leads should not exceed a length of 3m and they should be connected directly to the auto battery. An additional fuse at the battery is recommended to provide protection in case of cable short circuit to chassis ground from the amplifier to the battery.

The installation location must also provide a suitable ground system both for RF and the AC power supply, (if used). This is very important safety requirement for any radio transmission equipment but as power increases becomes increasingly important. A good RF ground will also help to prevent any returned RF from causing problems with the equipment. Usually erratic operation of equipment when in transmission may be attributed to RF being present or poor RF grounding. Installations where a good RF ground is not possible like operation above the ground floor may require alternative solutions such as artificial earths or the connection of 1/4 wave counterpoises to the operating equipment. Correct RF earthing techniques are however beyond the scope of this manual.

Mobile use should ensure that the ground connections are well bonded to the vehicle chassis ground for best results.

Operation:

Before using the amplifier the user must be familiar with all of the controls and be sure that it has been connected correctly. Refer to Page 3,4 of this instruction manual.

Important!!

Before the amplifier is switched on, the output power of the drive radio should be adjusted correctly if it is capable of outputting a power greater than 5W. This may be done with the amplifier connected but switched off. 10W is the maximum permissible input power to the amplifier, but approximately 5W input should be sufficient to realise full output, and an input power of 0.5-5W is OK as it is not necessary to run the amplifier at full output if not required.

Switch on the amplifier by pressing and holding switch ❶ for 2 seconds. There will be a single audible tone followed by a short self test after which the amplifier will be ready to use. The currently active band filter will be shown by the position of the Illuminated LED ❼ above it.

The band filter may be chosen manually by the user or automatically by the amplifier during the first transmission. To change the current band use the right ❺ and left ❻ 'BAND' buttons. If the wrong band filter is selected by the user the amplifier will automatically change it on the first transmission without error.

When the amplifier is in transmission LED ❹ is illuminated. When it is OFF the amplifier is in receive state.

To switch off the amplifier press the ON / OFF button ❶ for about 3 seconds. The amplifier will beep 3 times and then switch off.

The amplifier is protected against excessive input power, antenna VSWR, and temperature. Maximum input should not exceed 10W. The best performance of the amplifier will be obtained if the amplifier is operated at just less than full output which should be achieved with about 5W input.

ıntenna Considerations:

he amplifier is designed to work into a 50 ohms resistive load and any antenna outside of this :quirement must use an antenna tuning unit, (ATU / AMU), between the output of the ampli- er and antenna.

is recommended to check that the antenna to be used is sufficiently rated for at least 200W ɔwer handling before connecting this product. It is also recommended to check that the VSWR ɔes not change considerably with increased power as this would indicate that the antenna was ɔt suitable for high power use.

able losses particularly increase with increasing frequency. Always use a good quality 50 hm feeder and keep the length as short as possible. Not only will this allow more power to :ach the antenna but will also increase the signal strength at the receiver.

his amplifier should not be operated into mismatched loads, (high VSWR) An acceptable level ıould be less than 1.5:1. VSWR up to 2.0:1 is also possible but some reduction in power may ɜ seen and the amplifier will work less efficiently and generate more heat. At about 2.5:1 the nplifier will signal an error ❽ and will no longer transmit. The antenna should be tuned cor- ctly and the amplifier maybe used again. The amplifier will automatically return from this ror after a signalling the error tone followed by flashing the Prot. LED to signal the current ror. (See error table pg. 9).

Iode:

he MLA100 may be used for all of the common narrow band transmission modes such as SB, CW,AM,FM, SSTV and data modes etc. QSK operation is also possible up to about 30 pm.

Varning: Transmit Time.

i Duty cycle modes such as FM and Data modes etc. operate the amplifier at full power all of e time unlike modes like SSB and CW that are either intermittent or only reach peak output r very short times, these high duty cycle modes will run the amplifier much harder and gener- e more heat in the same amount of time. It should be noted that the amplifier although capa- e of being used with these modes should not be operated continuously. A transmission time of ore than a few minutes should be avoided to avoid excessive transistor junction temperature. ıe exact time for transmission in these modes will depend on numerous factors such as, how ɔod the ventilation around the amplifier is if there is sufficient space for freely flowing air to rculate, etc. If the ambient temperature is high this will reduce the total time in transmission. ɔmmon sense should be exercised if the heat sink is becoming too hot then sufficient time ould be allowed to let it cool down before reuse. The MLA100 is thermally protected and ill signal an error ❸ when the transistor case temperature reaches a certain point in order to otect the transistors. (See error table pg. 9).

Input drive and power output:

The amplifier should give full output with approximately 5W input on the HF bands and 8W on 6m band. Excessive input power should be avoided and the amplifier should always be operated in a responsible manner. If excessive input power is used the amplifier will signal an error ❸ and disable itself for a short period of time before resetting. See error table page 9.

Maximum output power considerations:

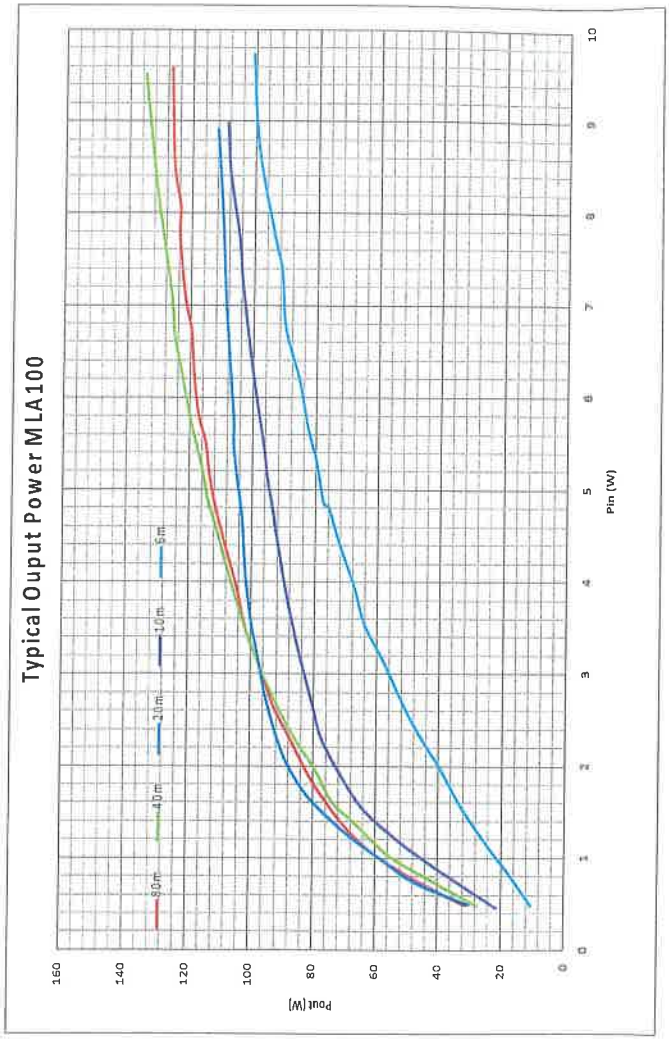
All amplifiers have a maximum output and this occurs shortly after gain compression where by Pin no longer produces a proportionate increase in power output . The amplifier should always be operated at a point below its saturated output. Trying to extract every last watt by overdriving the amplifier will not actually help your signal to be stronger, you will in fact cause higher levels of distortion which will make your signal less intelligible at the distant receiver station.

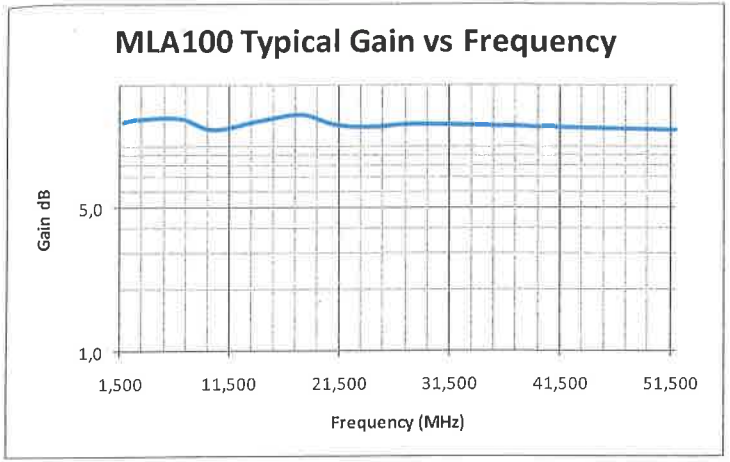
Running the amplifier a little under max output will also allow the amplifier to run cooler and make it more reliable for many years of use.

As an example consider the following situation.

1 'S' point on a receiver is usually approximately calibrated at 6dB so for example the difference between S5 and S7 2 'S' points is 12dB.

The difference between 5W and 100W is 13dB a healthy increase to your signal strength, a little over 2 'S' points, with the same antenna. Now lets say for example you run the amplifier at a moderate 90W output by slightly reducing the input power, the difference between 100W and 90W is less than 0.5dB which when you compare this to 6 dB per S point is actually very little and as the amplifier is not running at its absolute maximum will give a cleaner output with less distortion that will actually make a difference at the distant receiver for the better!!





Error	Warning	Action
PIN Switch RX	Cycle single flash LED Prot.	Reboot Amplifier. If the problem persists contact customer support
PIN Switch TX	Cycle 2 Flashes LED Prot.	Reboot Amplifier. If the roblem persists contact customer support
TX Frequency Error	Cycle 3 Flashes LED Prot.	No Tx 30 MHz to 50MHz
FCC	Cycle 4 Flashes LED Prot.	USA Model. Band Blocked 26-28 MHz. Change TX frequency
TX Frequency High	Cycle 5 Flashes LED Prot.	No TX Above 54MHz. Change TX frequency
TX Frequency Low	Cycle 6 Flash LED Prot.	No TX Below 1.5MHz . Change TX Frequency
Excessive Output Power	Cycle 7 Flashes LED Prot.	Reduce input power. Pin <10W.
Excessive Antenna VSWR	Cycle 8 Flashes LED Prot.	Investigate Antenna VSWR. Change antenna or use ATU to reduce VSWR >2.0:1
Excessive Input Power	Cycle 9 Flashes LED Prot.	Excessive Input Power. Reduce input power <7W.
Excessive Input VSWR	Cycle 10 Flashes LED Prot.	Check connection between transceiver and amplifier,. If problem persists contact customer support.
Excessive Amplifier Temperature	Cycle 11 Flashes LED Prot.	Amplifier too hot. Allow time to cool down, reset is automatic when temperature falls to within acceptable limits.