

## DEM 2MLDPA and 4MLDPA

### 2M and 4M power amplifiers designed for the FLEX-6700/6500 Transceivers

#### Description:

We have redesigned our **2M** and **4M** Low Drive Power Amplifiers to compliment the FLEX-6700/6500 transceivers. The main difference is the physical size and appearance. It measures approximately 6 ½" square and 4 ¼" tall with the Fan. The electronic design remains basically the same as the past version except for features that were made to take advantage of the FLEX 6000 transceiver capabilities. Still found are our popular VHF Low Noise Amplifier design with its robust IP3 performance, a bar graph RF power meter, sequencer, and cooling fan speed controller. It also still includes the bypass feature to allow additional transverter operation with the FLEX-6700/6500. So please note the changes to the new available options and special configurations. Also, understand that the redesigned features cater to the FLEX transceiver line but these amplifiers may be utilized with any transceiver or transverter with low drive levels that require additional RX amplification such as our 144-28INT.



### Specifications

Model #'s and Frequency	4MLDPA 70-72 MHz (Flex 6500 or 6700) 2MLDPA 144-148 MHz ( <b>NOTE: For Flex-6700 only!</b> )
Liner Power Output:	25W nominal for 4MLDPA 75W nominal for 2MLDPA
Noise Figure and Gain:	<0.8 dB NF, 17 dB Gain minimum
DC Power requirements:	13.8 VDC nominal 11 to 16.5 VDC operational. Current drain: 5 -6 amps 4MLDPA. 12-15 amps 2MLDPA

#### Product Features, New and Old! :

The DEMI 2 and 4MLDPA'S have some features that require detail explanations for full understanding of why they are implemented and how they perform in this design. They will be specifically listed and described in the following text.

#### **Transmit Output Power:**

Because of the availability of new hybrid power modules, the 2M version is now available again with a 75 watt nominal output level. The 4M version will only be available at a 25 watt

nominal level. All models will have 4 poles of band pass filtering (shared with the RX section) before its TX gain stages that boost the FLEX transceivers 70 or 144MHz XVTR port levels. Final output filtering includes a Low pass design that ensures a -65dBc spurious level on all bands. ALSO, over drive prevention with the standard FLEX transverter ports have been made.

**High Dynamic Range Receive Preamp / Filter Section:**

With the latest PHEMT technology, we were able to design one of the most robust low noise preamplifiers available to the Amateur Radio market today. This ensures that lowest amount of possible IMD interference will be introduced to the transceiver while maintaining a low system noise figure. Utilizing a diplexer between the LNA and band pass filter, high levels of reflected out of band signals and noise are absorbed and not allowed to “re-mix” in the LNA which produce the intermodulation distortion. Gain is a nominal level of 17 dB to maintain system noise figures and final gain is managed by the FLEX transceivers with their gain and attenuation controls.

What is **NEW** with the redesign is the availability of an external LNA operation option. We have added this option so that the LDPA’s can control a Mast Mount RX preamplifier and bypass



the internal LNA. This allows the user to increase the signal to noise performance without increasing the overall system gain. A manual switch on the front panel bypass the LDPA’s LNA and places a sequenced DC powered signal for your mast mount LNA either delivered through the coax or on an independent line through the AUX connector. This option carries and additional cost and is included in the “Remote Mode” option.

**Built in sequencer option:**

As in the past, we have provided a simple 4 step sequencer in all amplifier versions. It is all solid

state switching. This is a perfect complement to the FLEX transceivers allowing it to be completely isolated and dependent to the specific amplifier in use. The sequencer use is optional and is intended to provide additional switching circuits for controlling high performance 4M and 2M system utilizing high power amplifiers and mast mount preamplifiers. With simplicity in set up, and some simple common sense when using, this sequencer is an economic alternative to any external device on the market that would be consider if required. All external switching signals are accessible through a multi-pin connector located on the amplifiers back panel. The amplifier may be activated by the sequencer or directly by an external “Push to Talk” circuit either High or Low.

**Relative output power monitor circuit:**

The relative output power monitor bar graph display is standard in all amplifiers. This monitor circuit and 10 segment LED display calibrated for 9 bars in both 25 and 75 watt versions. The output monitor may be calibrated to indicate other levels if required. Understand that is a relative forward power meter and is not a reflected power meter. The RF detection circuit may be used separately or in conjunction with the 10 segment LED display in case of a requirement to monitor output power with the amplifier in a remote location. Consult DEMI for this option.

**Variable speed cooling fan:**

The 2MLDPA will have a cooling fan attached to the heat sink. The fan is controlled by a variable speed circuit on the amplifiers circuit board. The activation and speed will vary depending on the heat sink temperature and the ambient air temperature. The fan is required for the 2MLDPA but may be an option for the 4MLDPA if digital or FM use is not required.

**Other Amplifier Options:**

The amplifiers may be configured with different options depending on your specific operation. The “TX out - RX in” side or “Antenna Port” of the amplifier may share a common connector through an internal TR relay or be configured as two separate ports if driving a larger power amplifier. As briefly discussed before, the amplifiers RF power detect voltage may be routed out the AUX jack if you intend to remote mount the amplifier. The sequencer outputs may be configured to switch 12VDC or to ground on either TX or RX. An external DC voltage such as 28 VDC may also be switched if provided. Keying of the amplifier has options. Either a high or low will activate the amplifier directly or via the sequencer. Keying may also be done with a voltage signal on the input coax if desired to eliminate a configuration wire and if the transceiver being utilized has that capability.

**FLEX-6700/6500 Performance Enhancement Circuits in Manual Mode:**

One feature that is designed for the FLEX transceivers is the XVTR bypass function. When the LDPA is powered down, the signal from the FLEX XVTR port is bypassed around the amplifier and back out the connector panel. This enables the ability to route the XVTR signal to another amplifier or transverter. This makes it possible to “Daisy Chain” a 2MLDPA, and a 4MLDPA, then

continue on to a higher frequency transverter and/or a control box for multiple transverters. This is enabled by the on and off functions of the amplifiers which control the routing. PTT keying of the LDPA’s may be controlled by one of the three relay controls from the FLEX transceiver.

The LDPA’s have a standard gain LNA to establish an excellent system noise figure. If the gain is either excessive or not enough, the RX gain controls within the FLEX transceivers are used for adjustment. It may even be desirable to use the RX attenuator function of the FLEX.



In the same fashion, the output power of the amplifier, since it is linear, is controlled by the drive level from the FLEX transceivers. The drive should be adjusted in the CW mode to obtain 9 bars on the bar graph of the LDPA which is the full specified power. This should be near the maximum power derived from the FLEXX XVTR port. At any time the drive level may be lowered to operate at a lower output level. Driving the LDPA’s with anything more than the specified XVTR level will drive the amplifier out of its linear region.

## NEW! Remote Mode Option

New to this redesign is an added option for the ability to control all functions of the LDPA with the click of a Mouse! Through your latest version of Software for the FLEX 6500 and 6700 series products, you will be able to toggle the LDPA on and off for use. Toggling the LDPA off places it in the Bypass mode to allow additional amplifiers or Transverter to utilize the same port utilized by the LDPA. You will also have full control of the external Mast Mount LNA control that was described previously. It will allow the user to bypass the LDPA's internal RX amplifier and introduce a sequenced controlled voltage to an external device of your choice either through the RF coax or the LDPA's AUX connector. This allows the ability to remotely locate the LDPA for whatever reason! The limit will be the USB cable. This option is an additional charge but will come complete with a interface cable that plugs in to one of the two USB ports or hub utilized with your FLEX 6500/6700 Transceiver. This cable will also include the PTT function for the LDPA freeing up one of the three relay controls to be utilized by other accessories. Then as other features become available such as output power monitoring, they will be introduced to further enhance the compatibility of the FLEX and LDPA.

