



ELECRAFT® KXPA100

100-WATT AMPLIFIER

OWNER'S MANUAL

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Key to Symbols Abbreviations and Text Styles

 **Important – read carefully**

 Operating tip

TEMP *Tap* switch function (labeled *above* a switch)

PK HOLD *Hold* switch function (labeled *below* a switch; hold for 1/2 sec. to activate)

LED Light Emitting Diode

Installation

The KXPA100 is designed for installation in either a home station or mobile environment.

Two important mounting criteria must be observed. The heat sink fins must be oriented vertically to optimize natural convection air currents and the power cable run must be as direct as possible.

There are three recommended mounting positions: base down flat, with the heat sink horizontal and fins pointing up; front panel down, with the fins vertical; and rear panel down with the heat sink fins vertical. Do not place other equipment, papers, etc., on top of the KXPA100. Keep the KXPA100 out of direct sunlight if possible.

The KXPA100 draws as much as 24 A of power supply current. The power cable should be as short and direct as possible to minimize voltage drop. The red power lead connects to positive (+) 13.8V and the black lead connects to the negative terminal. The negative terminal is common to chassis ground. If the supplied cable is not long enough, make a cable using no smaller than #10 AWG conductors. For mobile installations, connect the power cable directly to the battery terminals.

The following text uses braces to refer to numbered elements in the front- and rear-panel illustrations below. For example, {14} refers to 14, the RF OUTPUT connector.

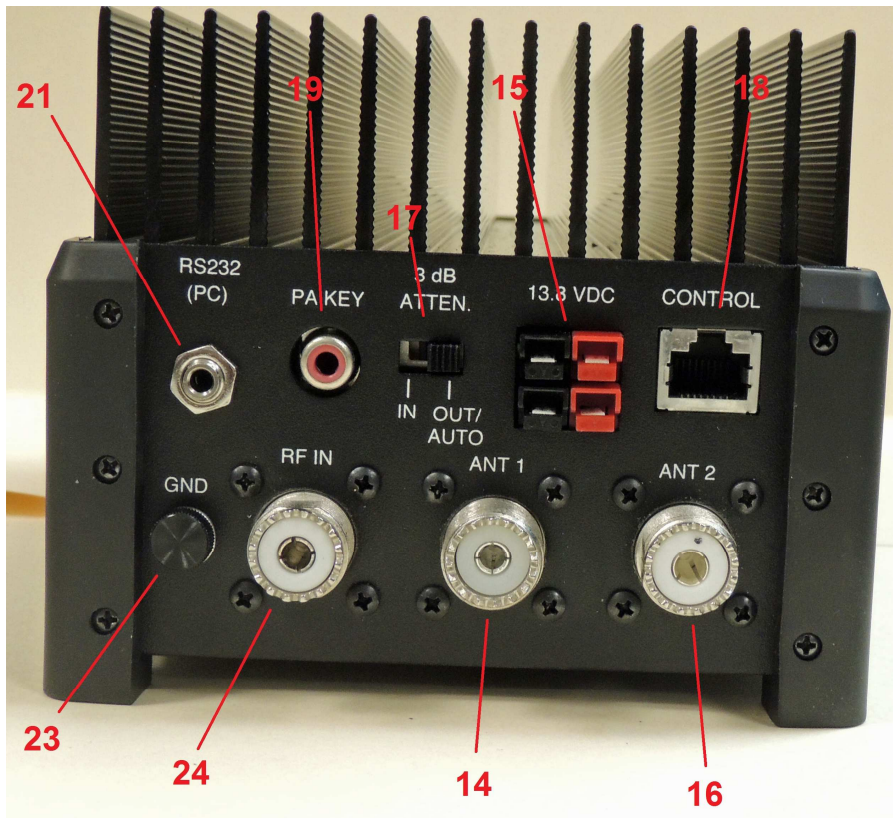


Figure 1. KXPA100 Rear Panel

Cabling

1. Connect your station ground to the GND thumbscrew {23}. A good station ground is important for safety and to minimize local radio frequency interference (RFI).
2. Attach the RF INPUT {24} to the output of your driving transceiver or transmitter using a 50 ohm coaxial cable with an PL-259 male connector on the KXPA100 end. The driving transmitter must supply up to 5 watts for full output from the KXPA100.
3. Attach the RF OUTPUT {14} to a suitable load with an SWR of less than 1.5:1. A dummy load is strongly recommended for initial testing.
4. Connect the PA KEY {19} to the driving transmitter Key Output. This line must be grounded to transmit, and 1 mA of current is sourced. The KXPA100 PA KEY jack is pulled up to 5VDC when not transmitting.
5. **Optional:** RS232 (PC) {21} connects the KXPA100 to your personal computer with a Elecraft KXUSB adapter cable. Required for updating the KXPA100 firmware.
6. **IMPORTANT:** Position the amplifier so the cooling fins may take advantage of natural convection. Three positions are recommended: base down with the fins pointing up, Front down, with the heat sink fins vertical, or Rear panel down with the heat sink fins oriented vertically. Ensure that there is at least 2 inches (5 cm) clearance above the amplifier for proper air flow.

Operation

Power On

1. Ensure a suitable 50 ohm load is attached to the ANT 1 connector on the rear panel (Figure 1, {14}). A dummy load is strongly recommended for initial tests.
2. Enable the power supply by sliding the front panel switch (Figure 2, {11}) to the On (I) position. The POWER LED should light.

⚠ IMPORTANT

Switches with a legend above and below the pushbutton have two functions. **Tap** (*press briefly*) to activate the function labeled **above** a switch. **Hold** to activate the function labeled **below** the switch. In the text, *tap* functions are shown like this: **TEMP**. An example of a *hold* function is **PK HOLD**.

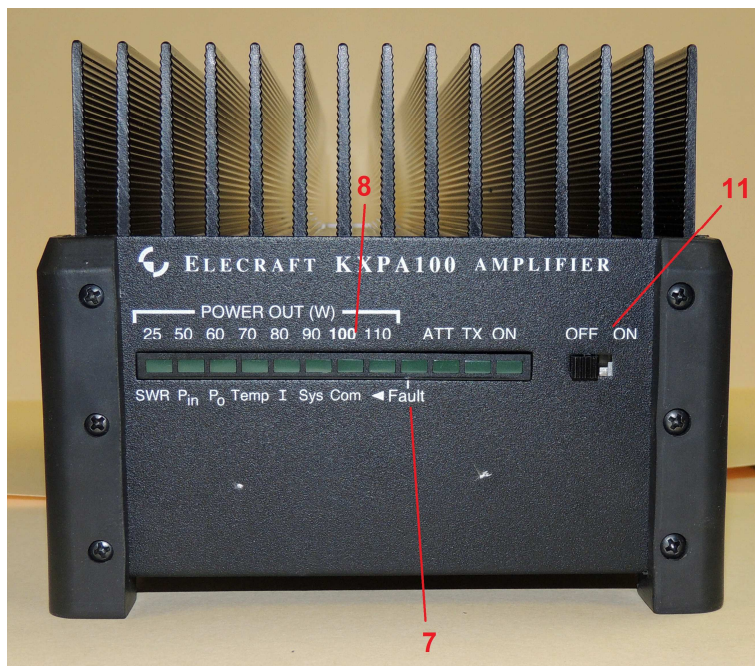


Figure 2. KXPA100 Front Panel.

⚠ NOTE: If at any time the FAULT LED {7} lights, refer to *Fault Conditions*, pg. 8.

Band Switching

The KXPA100 automatically measures the frequency of the RF drive and selects the proper band. The PA KEY input must be connected to the driving transmitter.

⚠ Important: The automatic band selection function is active whenever PA KEY is low (in transmit mode) and overrides band selection made by any other means to protect the KXPA100 from damage by wrong-band operation.

Transmitting

1. Apply a watt of RF drive and note that the POWER (W) LEDs {8} illuminate to indicate the RF output power.
2. Increase the drive power and confirm that the SWR LEDs indicate less than 1.5 while the output indicated by the POWER (W) LEDs increases. Up to 5 watts of drive is required to produce the full 100 watts output from the KXPA100. If more than 5 watts is applied, enable the input attenuator (3 dB ATTEN) {17} by sliding its switch to the ON position.

⚠ Important: Never exceed 10 watts of drive to the KXPA100 at any time.

Monitoring

KXPA100 operation is monitored by the LEDs.

LEDs

Standing wave ratio (SWR) of the load and output power are displayed on LED bar graphs. Excessive levels may trigger a fault and either bypass the KXPA100 or shut the power off (see *Fault Conditions* below). Also two green LEDs indicate whether the amplifier is in standby (STBY) or operating (OPER) mode.

Fault Conditions

The FAULT indicator {7} lights to indicate a fault condition has occurred and the KXPA100 is automatically switched to standby mode.

Low Level Faults

If the FAULT indicator is blinking, one of the following low level faults has occurred and will clear automatically when the condition is corrected.

Fault	Cause/Correction
Over Drive	RF Drive > 6 Watts (12W if the Attenuator is enabled) / Reduce RF drive to the KXPA100
Over Output	Excessive RF Output / Reduce RF Drive to KXPA100.
High Reflected Power	Reflected Power > 20 Watts
Invalid Frequency	Frequency counter detected transmissions in a restricted frequency band. Amp is automatically bypassed until the counter detects this error has been corrected.

High Level Faults

If the indicator is on steady, one of the following high-level faults has occurred and the KXPA100 has automatically switch to STBY mode. Clear the fault, then tap the OPR/STBY switch to resume operation.

Fault	Cause/Correction
Over Drive	RF Drive > 6 Watts over a period of time, or over 15 Watts momentarily. / Reduce RF drive to the KXPA100
Over Temp	Power Amp Heat Sink > 90°C / Check to ensure heat sink fins are oriented vertically and are clear of obstructions.
Over Current	Excessive Current to Power Amplifier / Check and reduce SWR.
High Reflected Power	Reflected power > 20W for an extended period of time or > 30W momentarily.
Open Load	Indicated SWR > 18:1
Over Dissipation	Finals are dissipating more than 120W of heat

Firmware Updates

New features and improvements are available to all KXPA100 owners via firmware upgrades

Please visit the Elecraft Software page (www.elecraft.com) to obtain our free firmware download application, ***KXPA100 Utility***. Versions of the Utility program are provided for PCs, Macs, and Linux platforms.

If you don't have Internet access, you can obtain a firmware upgrade on CD. If you don't have a computer, you can send your KXPA100 to Elecraft to be upgraded. See Customer Service, pg.11.

Specifications

Frequency Range	All Amateur Bands from 1.8 to 29.7 MHz and 50 to 54 MHz
Supply Voltage and Current	12-15V DC (13.8V Nominal), 24A (17A Nominal)
Weight	4 lbs
Size	Enclosure only, 4.0 x 10.7 x 10.0 in., HWD (10.2 x 27.2 x 25.4 cm). With projections, 4.4 x 11.1 x 11.8 in. (11.2 x 28.2 x 30.0 cm)
Power Output	100 watts
Duty Cycle at 100 Watts	10 minutes key down / 5 minutes off
Drive Power	4 watts for 100 watts output
Input VSWR	Less than 1.5:1
SWR	TBD
Heat Sink Temperature	90°C, maximum
Key In	+5V open circuit on receive, closed to ground on transmit (1 mA max.)
Efficiency	Approximately 50%

Customer Service and Support

Technical Assistance

You can send e-mail to k3support@elecraft.com and we will respond quickly – typically the same day Monday through Friday. If you need replacement parts, send an e-mail to parts@elecraft.com. Telephone assistance is available from 9 A.M. to 5 P.M. Pacific time (weekdays only) at 831-763-4211. Please use e-mail rather than calling when possible since this gives us a written record of the details of your problem and allows us to handle a larger number of requests each day.

Repair / Alignment Service

If necessary, you may return your Elecraft product to us for repair or alignment. (Note: We offer unlimited email and phone support, so please try that route first as we can usually help you find the problem quickly.)

IMPORTANT: You must contact Elecraft before mailing your product to obtain authorization for the return, what address to ship it to and current information on repair fees and turn around times. (Frequently we can determine the cause of your problem and save you the trouble of shipping it back to us.) Our repair location is different from our factory location in Aptos. We will give you the address to ship your kit to at the time of repair authorization. *Packages shipped to Aptos without authorization will incur an additional shipping charge for reshipment from Aptos to our repair depot.*

Elecraft 1-Year Limited Warranty

This warranty is effective as of the date of first consumer purchase (or if shipped from the factory, the date the product is shipped to the customer). It covers both our kits and fully assembled products. For kits, before requesting warranty service, you should fully complete the assembly, carefully following all instructions in the manual.

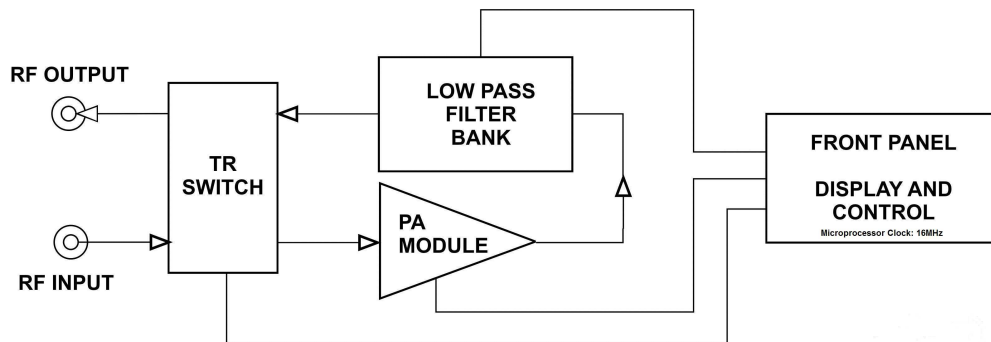
Who is covered: This warranty covers the original owner of the Elecraft product as disclosed to Elecraft at the time of order. Elecraft products transferred by the purchaser to a third party, either by sale, gift, or other method, who is not disclosed to Elecraft at the time of original order, are not covered by this warranty. If the Elecraft product is being bought indirectly for a third party, the third party's name and address must be provided at time of order to ensure warranty coverage.

What is covered: During the first year after date of purchase, Elecraft will replace defective or missing parts free of charge (post-paid). We will also correct any malfunction to kits or assembled units caused by defective parts and materials. Purchaser pays inbound shipping to us for warranty repair; we pay shipping to return the repaired equipment to you by UPS ground service or equivalent to the continental USA and Canada. For Alaska, Hawaii, and other destinations outside the U.S. and Canada, actual return shipping cost is paid by the owner.

What is not covered: This warranty does not cover correction of kit assembly errors. It also does not cover misalignment; repair of damage caused by misuse, negligence, or builder modifications; or any performance malfunctions involving non-Elecraft accessory equipment. The use of acid-core solder, water-soluble flux solder, or any corrosive or conductive flux or solvent will void this warranty in its entirety. Also not covered is reimbursement for loss of use, inconvenience, customer assembly or alignment time, or cost of unauthorized service.

Limitation of incidental or consequential damages: This warranty does not extend to non-Elecraft equipment or components used in conjunction with our products. Any such repair or replacement is the responsibility of the customer. Elecraft will not be liable for any special, indirect, incidental or consequential damages, including but not limited to any loss of business or profits.

Theory of Operation



When the KXPA100 is in Operating (OPER) mode, RF is routed by the Transmit-Receive (TR) switch to the Power Amplifier (PA) module where it is amplified by a pair of RD100HHF1 power MOSFETs.

The PA module output is routed to the Low Pass Filter (LPF) bank input. The LPF bank provides separate filters for each frequency band. The frequency of the incoming signal is monitored and the appropriate filter is automatically switched into the signal path.

The output of the LPF bank is routed to the RF Output via the TR Switch.

During receive or when the KXPA100 is in Standby (STBY), the TR switch routes the RF Input directly to the RF Output, bypassing both the PA Module and the Low Pass Filter Bank.

The MCU in the Display and Control module monitors and makes critical measurements of a number of operating conditions including two levels of fault conditions that automatically alter the operation of the KXPA100:

1. If an undesirable, but not critical, fault conditions occurs, a 3 dB attenuator is switched in line with the PA input and the FAULT LED is blinked at a 1 Hz rate to alert the operator. An example of such a fault is overdriving the KXPA100 input. When the fault is corrected, such as reducing the driving power, the 3 dB attenuator is switched out automatically and FAULT light stops blinking.
2. If a critical fault occurs, the amplifier is automatically switched to STANDBY, passing the RF drive directly through to the RF Output. The FAULT LED is illuminated continuously.

KIT ASSEMBLY PROCEDURE

TBD