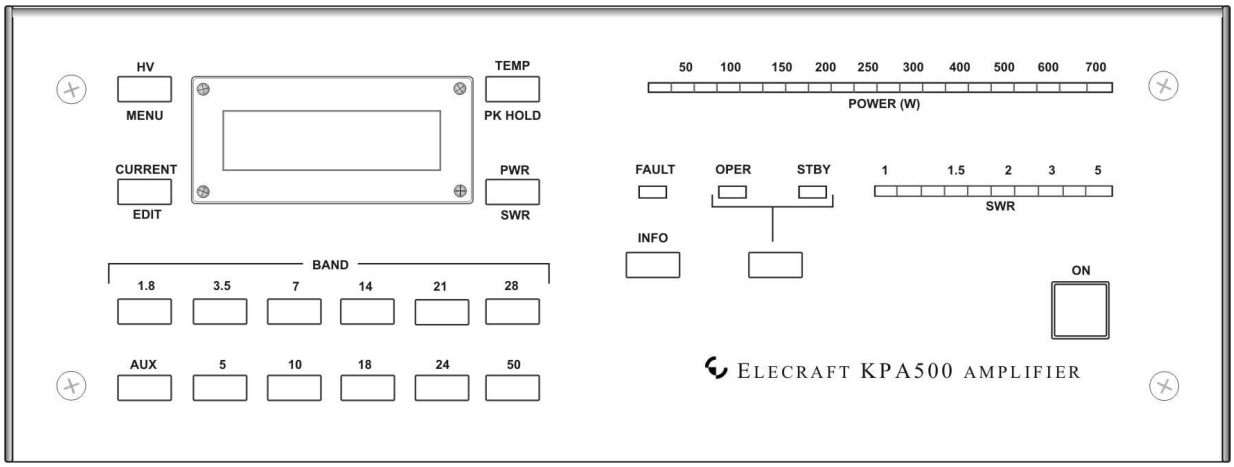
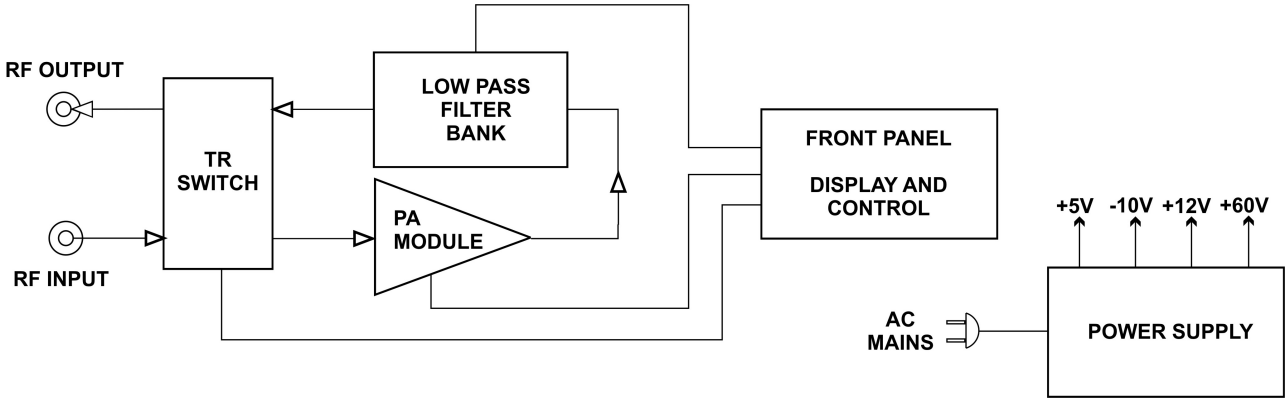



# ELECRAFT® KPA500

## 500-WATT AMPLIFIER

## OPERATIONAL DESCRIPTION

# Theory of Operation




When the KPA500 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 VRF2933 FETs.

The PA module output is routed to the Low Pass Filter (LPF) bank input. The LPF bank provides 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 filter also may be selected by band data provided by the transceiver or by front panel switches on the KPA500. However, the automatic selection based on the incoming signal frequency overrides either of those inputs to ensure the correct bandpass filter is always in the signal path.

If power input in the restricted frequency range between 26MHz and 28 MHz is detected, the amplifier automatically disables operation. The display shows “INVALID” and no power gain occurs. Toggling the OPER/STBY switch will not resume operation. Reset is accomplished only after the input frequency counter detects that input drive power is no longer in the restricted frequency range. The frequency counter is an integral part of amplifier operation: if the counter is disabled or shows an invalid count, amplification ceases within milliseconds.

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

During receive or when the KPA500 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 KPA500:

1. If an undesirable, but not critical, fault conditions occurs, a 3 dB attenuator is switched in line with the PA input and the red FAULT LED is blinked at a 1 Hz rate to alert the operator. An example of such a fault is overdriving the KPA500 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 red FAULT LED is lighted continuously and the fault conditions are displayed on the front panel.