

6.3 Initial Setup and Tuning

6.3.1 Control Functions

The following chart shows the controls that allow you to adjust and monitor the amplifier.

BAND	Used to select amateur band desired (in MHz).
TUNE	Sets output tank circuit to resonance within each band. Higher frequencies tend to tune toward the “0” end of the dial scale, while lower frequencies tend to tune further toward the “100” end.
LOAD	Sets amplifier plate loading and determines the power level at which best efficiency and linearity are achieved. In general, loading is heavier at greater scale settings. Higher frequencies tend to load more toward the “100” end of the dial scale and lower frequencies toward the “0” end.

6.3.2 Tune-Up

The objective of tune-up is to adjust the amplifier (and the drive applied to it) to obtain optimum efficiency and linearity at the desired output power. Any linear amplifier must be adjusted for optimum efficiency and linearity at each specific power level. If operation at higher power is then attempted without appropriate readjustment, the result will be flat topping also known as “splatter,” and (usually) excessive amplifier grid current. If operated at a much lower power level than it has been adjusted for, the amplifier’s efficiency decreases considerably.

Recommended practice is to tune first into a dummy load or artificial antenna, then connect the antenna and make any slight final adjustments that may be needed.

6.3.3 Grid Current Information

The ALPHA 8406 operates in Class AB1 when delivering maximum output power consistent with excellent linearity. A small amount of grid current flows and the green GRID MIN LED illuminates as drive approaches the optimum level. The green GRID LED will flicker on SSB voice peaks and illuminate under CW/SSTV/RTTY carrier conditions.

As overdrive approaches, grid current increases rapidly and the red GRID MAX LED illuminates. At maximum output and efficiency, the red LED lights dimly; full illumination of the red LED indicates overdrive and must be avoided. If the red LED lights up before the desired value of plate current and/or against grid current fluctuations.

On SSB, optimum output consistent with good linearity, occurs when the green forward LED’s illuminates on most voice peaks and the red LED flickers dimly on only the highest peaks. Excessive grid current results from overdrive and/or inadequate loading. The solution is to restrict drive, and/or increase amplifier loading. The 8406’s 4CX1500B tube is well protected and these adjustments tend to be less critical than in many other amplifiers. Grid bias is

stabilized against grid current fluctuations.

6.3.4 ALC

The 8406 grid current limiting circuits provide substantial tube protection against possible damage, therefore no ALC control is necessary. It is only necessary to set the drive power from the radio as detailed in this manual.

6.3.5 Turning On The Amplifier

Please Note: Every time the ALPHA 8406 is powered up, there is a built-in 180 second warm up wait.

1. Place the OPR/STBY switch to STBY (standby).
2. Rotate the multimeter selector switch to HV.
3. Depress the POWER/ON switch. The fan and blower should immediately begin to operate. If there is no air flow from the amplifier and no sound of blower operation, immediately turn the amplifier off and investigate.
4. Within two seconds, the HV display should be all the way to the right, certainly above 2,500 Volts. If it is lower than this, investigate further- perhaps the primary taps are not correctly set.
5. At this time the red LED representing 1800 W output power is illuminated, indicating 180 seconds countdown remaining ($1800/10 = 180$ seconds). As the timer counts down, the remaining time will be indicated by the currently illuminated LED on the power output bar graph moving to the left.
6. Move the multimeter switch to the Ip position. There should be no current indicated, and this should be true during the entire period the amplifier is warming up. Leave the switch in the Ip position during amplifier warm up. The “Wait” LED will be blinking about twice per second, indicating that warm up is still in progress. The FAULT, OPER and STBY LED’s should not be illuminated.