

## 91B BIAS LEVEL ADJUSTMENTS

**Equipment required:** Digital Multimeter, 14 pin IC clip, clip-lead to short IC clip pins.

Remove amplifier cover and defeat both safety interlocks (microswitch at rear and HV crowbar at center of amp). Connect the transceiver T/R relay control to the 91B RELAY jack. Make no connection to the 91B RF input at this time (connect radio RF output to dummy-load or antenna, but NOT to amplifier input).

The following steps will allow adjustment of the bias switching circuitry:

1. Remove knobs and front panel screws to provide access to Control Board adjustments. Insure that cables between front panel and Control Board are properly seated.
2. Set DVM to measure DC voltage. Connect DVM positive lead to chassis. Connect negative lead to B- (anode of D16 or D17 on HV Diode Board).
3. Connect the 14 pin IC clip to U4.
4. Turn on amplifier.
5. Place 91B in OPERATE. Short IC clip pins 4 and 5 (this step actually keys the amp simulating RF applied). Verify 3.8 vdc on DMM, adjust R62 BIAS pot as necessary. Remove short on IC pins.
6. Key the transceiver, verify 0.5-0.7 vdc on DMM; adjust R61 EBS ADJ pot as necessary. Unkey transceiver.
7. Check the adjustments in steps 5 and 6 several times, there is some interaction between them.

8. With amplifier unkeyed, verify that voltage on U4 pin 6 is 0.50 vdc; adjust R41 EBS LVL pot as necessary. Remove IC clip.
9. When reassembling the amplifier, set TUNE and LOAD capacitors to fully meshed and install knobs so that  $TUNE = 100$ ,  $LOAD = 0$ .

## Alpha 91B Tuneup:

Please limit the transceiver drive to about 60w for tuning up and operating the amp.

Set Multimeter to Ip (Plate Current). Set TUNE and LOAD controls to numbers indicated in the tuneup sheet originally included with the amplifier.

Key radio with 20w drive and adjust TUNE control for a peak in RF out which would be at the same point as a dip in Ip.

Increase drive to get 1000w output, going back and forth between the TUNE and LOAD to peak the RF output. If more output is desired, increase drive from radio slightly, increase LOAD for a peak in RF out, then peak RF out with TUNE control.

When the amplifier is tuned correctly on 160m thru 40m, the Ip should not need to be more than 0.9A (read on the 0-to-1.5A scale) for 1500w output, and drive should not need to be more than about 60w. On 20m the Ip will usually be about 1.0A for 1500w output.

Plate current (Ip) is the most useful parameter to monitor with the Multimeter during normal operation of the amplifier.

**CAUTION !** Disable VOX function of radio BEFORE changing bands on the amplifier. The bandswitch detent makes a noise that can activate the VOX and key the amp while the bandswitch is still moving. This will burn the bandswitch contacts!

**NOTE!!! Do NOT use the radio internal antenna tuner when the amplifier is connected to the output of the radio, even if the amp is off or in bypass, because the relays and wiring in the amp become part of the feedline that the tuner is matching to the antenna. Depending on the antenna impedance, there can be very high voltages at points along the feedline even when running only 100w from the radio alone. This can damage the T/R relays in the amplifier.**