



## PRODUCT SERVICE BULLETIN

### 816R-xC Grid Tuning Instructions

10-22-02

1. Proper adjustment of the grid inductors should allow the PA Grid Tune and Coupling capacitors to tune the IPA VSWR to minimum with PA Grid current from 90 to 105 mA. Adjust all three-grid inductor (parallel bars) to a position that allows the PA Grid Tune capacitor to be in its center tuning range. Adjust in small increments such as 1/8 inch. Allow PA Grid Coupling to fall where it will. The output power from the IPA can be adjusted to a lower power to begin tune up and then increased slowly (Use the exciter to increase and decrease drive). The input impedance will decrease as grid input power is increased. Continue to adjust PA Grid Tune and Coupling as drive power is increased. This may take several tries. Also, you will notice that as plate voltage is increased so will reflected power.
2. Adjust the efficiency capacitor for minimum plate current and maximum power out. Do this with the transmitter in Auto power control. The efficiency capacitor will have a large effect at the low end of the band (88Mhz) and almost no effect at the top of the band (108Mhz).
3. Check PA neutralization by adjusting PA tuning in the raise mode. Watch PA grid current. If it rises then the amplifier is regenerative. If it stays the same then neutralization is perfect. If it falls then neutralization is degenrative which is the preferred mode.
4. Move neutralization tabs out to make amplifier more degenerative. This also has the effect of decreasing grid current. Likewise moving them in increases grid current and makes the amplifier more regenerative. Adjust in small increments such as 1/8 inch or smaller.
5. The resistive swamping circuit on the input should be used to broadband the input. Move parallel plates together to increase swamping effect. Often this will aid in cold starting ability. Moving the plates too close can result in excessive power absorbed by the resistor and to little drive to grid.

- 6.** Use the four bypass capacitors and their sliders to improve PA efficiency. Move the ends of the capacitors close to the socket and then away to change the overall effect of the efficiency capacitor. Again this may take several tries to find the best operation of the efficiency control. Sometimes it is only necessary to move one to two capacitors to achieve the desired effect.
- 7.** It is helpful to have a thermometer on the exhaust stack to monitor the temperature during these adjustments. Often the temperature will indicate positive and negative changes faster than can be noticed using meter readings from the amplifier.
- 8.** 700W amplifiers should use RG-142 coax cut to length by the following formula.  
$$L \text{ (inches)} = 4075 / \text{Frequency (In Megahertz)}$$
- 9.** Dual 400W amplifiers use RG-142 cut to length by a chart provided by the factory.
- 10.** Each of these adjustments may take several tries to find the best operation. Likewise, these adjustments will interact with each other, so allow the transmitter to stabilize after each adjustment. This will allow you to see what the changes did to tuning and help in determining if additional changes are needed.