

## **1.1 TUNNING PROCEDURE**

### **1.1.1 General**

For each band and operating frequency, the transceiver settings must match the position of the BAND switch on the front panel of the DX-1d, while the PLATE and LOAD knobs must be adjusted for optimum operation which gives – in conjunction with the input drive level, the maximum output power that can be obtained for that input power. When the tuning is correct, this will also result in a minimum plate current, minimum plate dissipation and good linearity.

### **1.1.2 Preliminary tuning**

- Turn the BAND switch to the same band setting as the transceiver.
- Put LOAD and PLATE knobs in the initial positions given in Table 1.
- DX-1d must be powered ON and "Ready", with the OPR/STBY switch in OPR position.
- Start with the transmitter at minimum power, in a "carrier" mode e.g. RTTY or CW - key down.
- Key the transceiver ON and gradually apply power to the DX-1d. When 0.5 to 1 W of drive is reached, the EBS is activated and the plate current jumps from zero to about 0.3 A
- Increase the drive until there is some output power indicated. If the current plate  $I_p$  reaches about 0.5 A and there is still no output indication, turn PTT off and check the connections, the band and the initial settings.
- As soon as there is any power indication, tune PLATE for maximum output (and minimum plate current).
- Apply more drive and adjust PLATE again for maximum output. Keep PTT ON for short time only (about 10 seconds). Go gradually, in several steps. When about 4 - 500W output is reached, adjust LOAD for maximum output. If there is no red Ig2 indication, it is likely that LOAD needs to be turned clockwise, towards higher numbers on the dial.
- Apply more drive and adjust both knobs again. When screen current appears (red Ig2 indication), increase loading by turning anti-clockwise the loading knob. (LOAD towards lower numbers on dial) until Ig2 drops almost to zero. Then adjust PLATE for maximum output power and maximum Ig2. At this point, Ig2 is the most sensitive indicator of resonance on the working frequency. If Ig2 goes too high (e.g. starts blinking), increase the loading again, then tune PLATE.
- Repeat the above steps, while gradually increasing the input drive power, until the overdrive indicator just starts turning on. Now the DX-1d is tuned for operation at full power on that particular operating frequency.

**NOTES:**

1. The maximum power is obtained from a DX-1d when:
  - onset of the overdrive indication
  - PLATE is tuned for maximum output power, maximum screen current Ig2 and minimum plate current, Ip
  - Ig2 indicator shows 2 or 3 red LEDs.
2. The above conditions will also give the best linearity.
3. During the preliminary tuning, switch PTT on and off several times, to allow time for tube cooling. The tube dissipation (at a given drive level) is minimum when tuning is optimum. In short, be brief, with tuning "bursts".
4. Preliminary tuning, as described above, is only necessary when operating for the first time in a certain band. When the final settings for PLATE and LOAD have been found for the particular working conditions - especially the antenna used, note your settings on Table 1. The new settings will normally differ to some extent from the ones indicated, depending on the "purity" of your antenna load.

### 1.1.3 Final tuning

Once the preliminary tuning has been done for each band / antenna combination, the values found for PLATE and LOAD can be used for final tuning, with no need to repeat the preliminary tuning every time.

#### Tuning for full power

- Start with low drive level and the PLATE and LOAD knobs in the known initial positions
- Put PTT ON and increase the power (fairly quickly), to the onset of the overdrive indication. If the screen current (red Ig2) goes too high, adjust LOAD, by turning the knob to the left (increasing the load).
- Adjust the drive level and LOAD until the overdrive indicator is just about to turn ON, and at the same time Ig2 shows two or three red LED's ON.
- Fine tune PLATE for maximum output and maximum Ig2. Repeat the step above if required.

#### Tuning for less than full power

- Start at low power, with the initial values for PLATE and LOAD
- Put PTT ON and apply drive until the output is about 1/2 of the desired power.
- Adjust LOAD for maximum output. Most likely, the knob will have to be rotated to the right, towards higher numbers on the dial.
- Adjust PLATE for maximum output

- Apply more power
- Repeat the 3 steps above until the required power is achieved. If screen current is indicated by Ig2, is should, display one to three red LED's. Maximise this Ig2 indication (and the output power at the same time), by tuning PLA TE

Please note that the tuning at lower power is different from the setting at full power.

- If the output goes higher then desired, reduce the drive *and re-tune*. **Never reduce the output by de-tuning the amplifier!**

**NOTE:** If the output is low (say, less than about 400W), Ig2 will never show any screen current at all. Ig2 might even indicate a negative current, in green - this is normal and is no cause for concern).

However, if there (green) negative current indication, usually this will go away with better tuning of the PLATE control.

If there is no Ig2 red indication., simply rotate LOAD to the right in small steps, and each time maximise the output by turning PLATE, until the highest possible maximum in the output power is achieved.