



SOCIETÀ PER L'ELETTRONICA s.r.l.

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Exhibit 11: Tuning Procedure

**External Radio Frequency
Linear Amplifier
Model 1.5K-FA**



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Tuning Procedure

TUNER (ATU)

The amplifier has an automatic tuner that handles load mismatches up to 3:1 VSWR (2.5:1 for 6 m). The amplifier contains a look-up table with all the permitted bands.

For tuner management, antenna data and other working data are stored.

Every band has a sub-band set, and for each of those, data related to the antenna and auto-ATU tuning is stored.

The CAT and the frequency counter detect the operating frequency and the correct sub-band. Thanks to the stored data, the tuner and the antenna are automatically set correctly.

The amplifier is equipped with two different memory banks, "Bank A" and "Bank B", which one can use to store two different configurations. This feature is particularly useful if one participates in a DXpedition.

If one of the memory banks is set as home station, when back, just recall the proper memory bank.

Furthermore, table driven management is useful to inhibit operation of the amplifier, for instance when an antenna for a particular band is not available.

All auto-tuner functions remain, on standby, whilst using the transceiver only.

Setting of the match data to write to the tables is performed automatically by pressing the [TUNE] key. The system will then find the correct match for minimum SWR.

To achieve a better match than that achieved with the automatic tune routine (most unlikely) it is possible to set the tuning manually by using the keys [◀C], [C▶], [◀L], [L▶].

When manual tuning has been performed, it is possible to read the tuning value, the working frequency and the associated sub-band on the appropriate screen page.

Both the types of tuning are always effected in "STANDBY" state.

Before beginning the matching process, the tuner measures the SWR of the system cable / antenna. If it is greater than 3.5:1, the procedure does not begin and an alarm is given.

It is possible to bypass the tuner with a specific command, in order to use an external tuner.

NEVER USE THE INTERNAL TUNER WITH AN EXTERNAL ONE, it could seriously damage the linear.

IF YOU WANT USE AN EXTERNAL TUNER, BEFORE EXCLUDE THE INTERNAL ONE.

The internal tuner may be excluded:

- Totally.
- For single band.
- For single band only with a specific antenna.

It is always automatically excluded:

- With the only receiving antenna set
- With tunable antenna set.

Note: the tuner, like all analog circuits, introduces a loss (0,8 dB max.) that may vary with tuning conditions. The power meter of the amplifier does not show this loss as the power is measured at the tuner input where the load resistance is always constant (50 ohm).



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Note: ATTENTION: When the amplifier is either in “STANDBY” or “OPERATE” mode, always disable the automatic tuner in your transceiver.

SET ANTENNA.

Press [SET] and open the “ANTENNA” menu page.

Assign an appropriate antenna for the band concerned. If you don't have an antenna for a band, input “N”. When all the antennas are programmed, exit and go back to STANDBY.

USE OF AUTOMATIC TUNER.

To complete the programming it is necessary to match the antennas to the amplifier by operating “TUNE” function. (read the “TUNER” chapter of the manual).

We recommend that you select each band (with available antenna) and then program the tuner for the sub-bands within which you will operate.

Refer to the table in section 19 of the manual to select the appropriate sub-bands for your operating preferences.

You are strongly advised to proceed with the utmost accuracy, not just match the current frequency, but all matching all the antennas on all bands that are available, allows you to enjoy all the features of the automatic linear.

To program the sub-bands, proceed as follows:

- 1) For every band find the central frequency in the table of each sub-band (refer to section 19 of the manual). Then set the transceiver to that frequency.
- 2) Next, set your transceiver to transmit a continuous tone (RTTY or FM).
- 3) Then press the [TUNE] key and then the PTT. The procedure for automatic tuning will start. You will hear the ATU relays operate and when they stop, the SWR will be at a minimum. Sometimes it is possible to improve tuning by repeating this step.
- 4) Repeat the previous steps for all sub-bands of bands you wish to use.
- 5) Repeat the previous steps for other antennas of the same band after having selected it using the [ANT] key.

Note: if the ALC link is not used, it is preferable to reduce the transceiver power to about 30 Watts during this operation.