

Bulletin 5

LCD backlight replacement in FM1000 control head with numeric keypad

In a number of FM1000 display consoles of the numeric keypad type, the LCD backlight lamp is faulty and has not been replaced.

The main specifications of the backlight lamp are as follows:

Connections:	wires
Colour:	green
Current consumption:	approx. 80 mA
Diameter:	approx. 3 mm

Unfortunately I do not have more detailed data. Because the lamp is controlled by a temperature-compensated 80 mA current source, its voltage specification is not terribly important, apparently any voltage between 4 volts and 8 volts may be used. The only alternative I have been able to find is a 40 mA green "micro lamp" sold by Conrad under order number **72 70 75-11**. In the product catalogue of Bürklin, Germany, I found the perfect replacement lamp but the required order volume of 100 pcs is beyond my capacity.

Below is a suggested method of replacing the lamp. Accurate work is required because the complete display is easily destroyed beyond repair (FUBR).

- 1.** Remove the display head from the transceiver and open the display case. The volume knob may be pulled from the potentiometer spindle. Remove the two screws from the display board. One is found near the volume pot, the other between the keypad keys. Carefully push a screwdriver blade between the PCB and the metal back side, near the two rows of 8 pins at the top side. Carefully prise until the connectors come loose. Remove the top board. Protect the pin rows by with pieces of polystyrene.
- 2.** At the underside of the display board you'll see 8 metal 'ears' which need to be turned horizontally using pliers so that they can pass through the slots in the PCB. Put the PCB on the table with the display towards you. Using your thumbs and index fingers, exert light force on the four corners of the display, pushing it up from the display board. You will hear and feel a weak glue connection coming loose. Remove the LCD and the light guide attached to it, and notice the mounting order of the white sheet and the grey plastic filler piece below the LCD. Find the two alignment notches on the lower rim of the LCD. Carefully lay all components on the table, observing the assembly order. Do not touch the connector bands on the LCD.
- 3.** The green lamp is now visible next to the volume pot. Carefully heat both solder connections at the underside of the board, then pull the faulty lamp from the board. Using a solder sucker or desoldering braid, clean up the solder holes. Mount the new lamp, observing its mounting height.
- 4.** Place the filler piece and the white sheet on the display board. Everything should fit snugly. Carefully place the LCD onto the board, keeping an eye on the 2 mounting notches which should go into the holes in the PCB. Inspect the position of the eight 'ears'. If one or several are too deep, you need to re-align the LCD or the two plastic adjunct until a perfect fit is obtained.
- 5.** Turn the 'ears' over the PCB surface. Inspect your work. Re-assemble the display unit and connect and secure it to the transceiver.
- 6.** If you find that a column of LCD symbols is missing (usually at the left side), then the LCD is not correctly positioned on the elastomer connector. You will have to disassemble the display again and re-adjust the LCD position

Using the above method I have successfully fitted a new lamp in more than 20 'ex-service' displays. The work time was approx. 15 minutes per display. The Conrad lamp will, unfortunately, not achieve the same light intensity as the original Philips lamp.