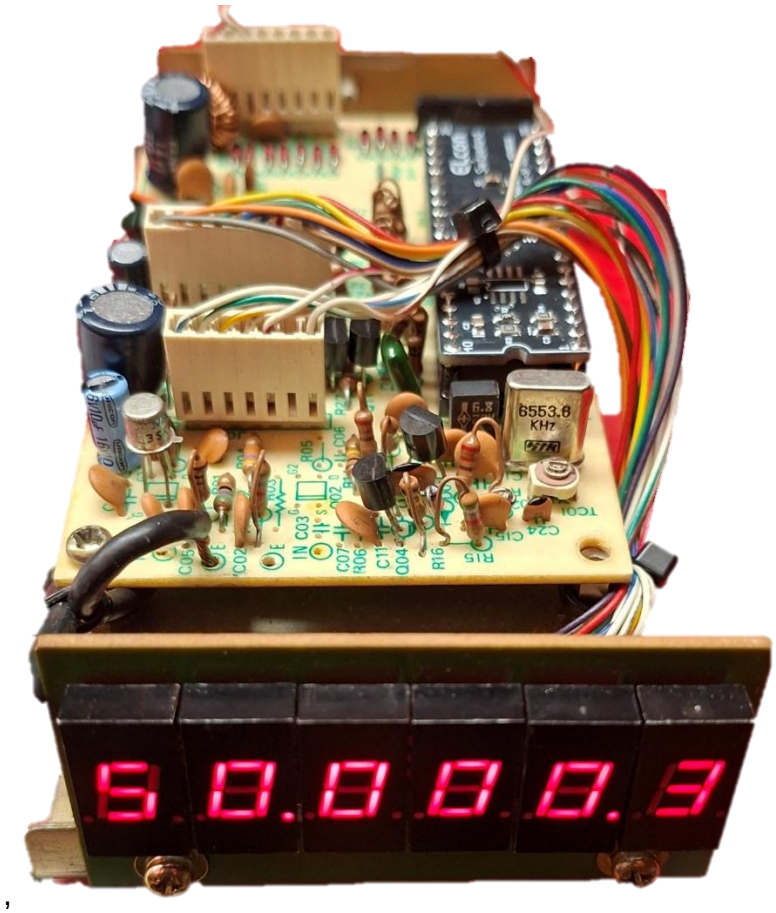
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EL-37

Replacement Display Controller
for the
YAESU FT-902D, FT-707, FT-107, and others



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Installation and Function Description

from SW-Version 2.2a

October 23, 2026

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Important! Advices or tips for the correct function of the EL-37



Caution! The instructions must be observed carefully.

1 Introduction and Functional Description

The EL-37 replaces the OKI MSM9520RS display controller—which is no longer available—in the Display Counter UNIT (PB-2086A) of Yaesu transceivers. It plugs into the 40-pin socket on the circuit board; no modifications are required on the Counter UNIT.

Function

- Counts the measured frequency and controls the 6-digit frequency display. The resolution is 100 Hz. → e.g., 
- Emulates the control logic and interface signals of the MSM9520RS so that the display, button functions, and behavior of the transceiver remain unchanged.
- By closing a jumper, the display of the digit 7 can be changed from the original YAESU  to the standard 
- Uses modern electronics that are available for the long term and is powered by 5 V from the Counter UNIT.

Compatibility

- FT-101 Mark II (has WARC – with 30m 17m 12m)
- FT-101 Mark III (has WARC – with 30m 17m 12m)
- FT-107
- FT-707
- FT-901 D / DM – late series
- FT-902



Note: You can tell if a device is compatible by checking for the 40-pin MSM9520RS connector on the Counter UNIT.

2 Package Contents and Tools

Included in the package

- EL-37 Module
- 40-pin IC socket

You will need

- Temperature-controlled soldering iron with a fine tip, desoldering station or desoldering braid (solder wick)
- Side-cutting pliers, magnifying glass, multimeter
- Screwdriver compatible with the mounting screws
- Plastic alignment tool for TC01
- Cell phone or camera to take pictures of the cable routing before removal

3 Installation in the Display Counter UNIT (PB-2086A)

3.1 Safety Instructions

- Caution: Danger to Life: Before opening the unit, unplug it and disconnect it from all power sources. The tube-based units (FT-101, FT-901, FT-902) contain high voltage. Capacitors may remain charged after the unit is turned off. After unplugging the unit, you must wait 5 minutes.
- ESD: The EL-37 contains sensitive semiconductors. Discharge yourself before touching it (by touching a grounding strap or a metal part) and hold it only by the edge.
- Never energize the device with the counter unit removed or loose unless it is designed to do so.
- These projects are intended for people with soldering experience. If you are unsure, consult a professional.

3.2 Installation

The circuit board must be removed from the transceiver for installation.

Proceed as follows:

- ☐ Unplug the power cord and follow the safety instructions (see above).
- ☐ Take a photo of or mark the locations of the connectors and cables.
- ☐ Disconnect all connectors attached to the circuit board. (3 connectors)
- ☐ Unplug the 3-pin connector connected to the 5-V regulator IC on the back.
- ☐ Unsolder the coaxial cable from the PRE-MIX UNIT or disconnect the RCA plug.
- ☐ Disconnect the black ground wire by loosening one of the mounting screws on the PRE-MIX UNIT. No desoldering is required at this point.



Caution: Do not lose any washers or screws. Pay special attention to the plastic screws on the two front mounts and the insulating washer under the circuit board. Reinstall them in the same places during reassembly.

- ☐ Remove the defective MSM9520RS (40-pin). Desolder it carefully using a desoldering station. If you do not have a desoldering station, cut off all the legs attached to the IC body from the top side of the circuit board, remove the IC, and desolder the individual wire stubs one by one.
- ☐ Clean the solder eyes with desoldering braid (solder wick) until all holes are clear. Be careful not to overheat or damage the solder eyes or conductor tracks. Soldering iron temperature: approx. 320°C.
- ☐ Solder in the included 40-pin IC socket. The notch on the base points toward the quartz.



No modifications may be made to the Display Counter UNIT.

- ☐ Check all solder joints very carefully!



A magnifying glass can be helpful here, because even the tiniest, unintended solder bridges can have disastrous consequences.

- ☐ Then reassemble the circuit board using the four screws.

- [ ] Reconnect all the plugs that were unplugged, and connect the RCA plug and the ground wire as well.
- [ ] Carefully insert the EL-37 module into the 40-pin socket.

IMPORTANT: Be sure to observe the installation orientation, as failure to do so may damage the module. Before turning on the power, check the orientation and fit of all pins again.

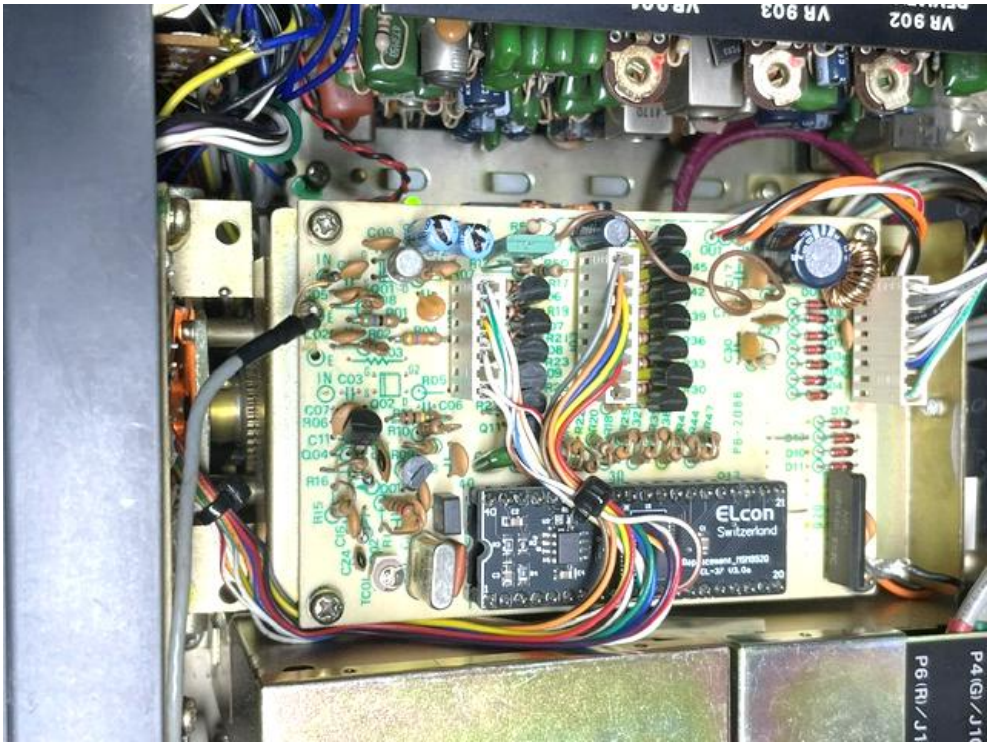


Figure 1

3.3 Calibration of the Frequency Measurement Circuit

Calibration is performed using the TC01 trimmer (located directly next to the crystal; see Figure 1) at a known frequency.

- [ ] Turn on the appliance and let it warm up for 30 minutes.
- [ ] Tune in to a well-known frequency, such as the WWV time signal transmitter at 10,000 MHz. Use USB or LSB mode.
- [ ] Carefully adjust the VFO knob to zero beat.
- [ ] Use a plastic calibration tool to adjust TC01 so that the display shows the known frequency ±100 Hz.
- [ ] To verify the results, check a second band if another time signal transmitter or measurement transmitter is available.

Connecting a frequency counter to one of the quartz terminals can interfere with the oscillation and is therefore not recommended.

3.4 Displaying of numeric 7

By default, YAESU uses the 7 (seven) numeric on devices with a digital frequency display, as shown on the right in Figure 3.

However, if you prefer the 7 (seven) numeric, as shown on the left in Figure 3, you must close jumper J2 on the module.

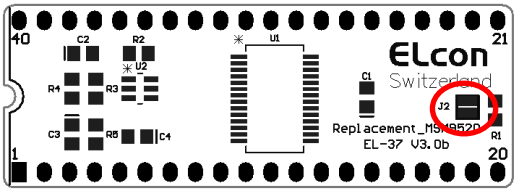


Figure 2



Figure 3

4 Troubleshooting

After powering on, the display should show the tuned reception frequency.

Symptom	Possible cause	Solution
The screen remains dark	5-V connector not plugged in, module inserted upside down or not fully inserted	Turn it off immediately; check the plug, orientation, and fit of the module
Some segments are missing or are lit incorrectly	Solder bridge or cold solder joint on the socket	Inspect solder joints under a magnifying glass; remove bridges
Display is stable, but the frequency is off by a fixed amount	Frequency measurement circuit not calibrated	Perform the adjustment according to 3.3
The display jumps or flickers	Possible error in the Counter-UNIT's AGC	
The module gets hot	Incorrect installation orientation or short circuit	Turn off immediately, remove the module, and check the socket and solder joints

5 Appendix

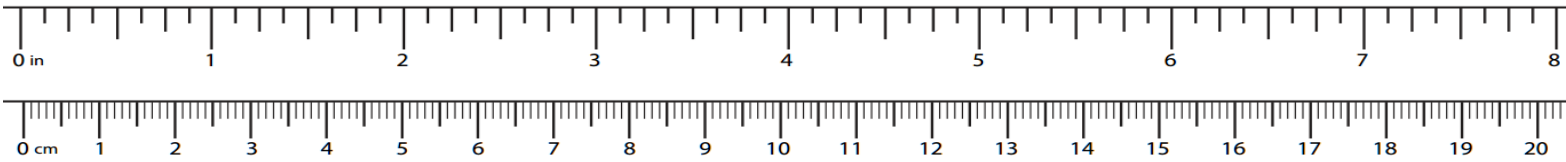
5.1 Specification

Measuring ranges:

Frequency:	10 -50MHz, Resolution 100Hz
Power supply:	5V von Counter UNIT, about 10mA
Dimensions:	52(L) × 18(B) × 13(H) mm
Design:	40-polig, Grid Dimensions 2.54mm, Row spacing 15.24mm

All specifications can be changed by ELcon without further notice or obligation.

5.2 Rulers



5.3 Repair / Warranty

We have no influence on the correct and proper assembly and can only guarantee the completeness and flawless condition of the components. We guarantee that the components will function in accordance with their characteristic values when not installed and that the technical data of the module will be adhered to when professionally processed in accordance with the installation instructions and commissioned or connected and operated as prescribed. We do not warrant or assume any liability for damages or consequential damages in connection with this product. We reserve the right to repair, rectify, deliver spare parts or refund the purchase price. Further claims are excluded.

The following criteria will not be repaired or are not covered by warranty:

- if acidic solder, solder grease or acidic flux etc. was used for soldering.
- if the kit has been improperly soldered, glued and assembled.
- during modifications and repair attempts on the module.
- in case of unauthorized modification of the module or the circuit.
- in case of improper removal of components not provided for in the design, improper free wiring, etc.
- Use of other components not originally part of the kit.
- in the event of incorrect assembly and wiring, as well as the resulting consequential damage.
- damage caused by non-observance of the operating instructions or the schematic and assembly diagram.
- if the module is connected to an incorrect voltage or type of current or if the polarity is incorrect.
- in the event of faulty operation or damage due to negligent handling or misuse.
- defects caused by bridged fuses or the use of incorrect fuses.

In all cases the transport costs of the kit shall be borne by you.

5.4 Notes

