

STAMPFL Stressless

0.1-30 MHz AM - RECEIVER KIT

Hardware: HB9KOC
Heinz Stampfl

Software: DL2EBV
Dr. Ernst Kirschbaum



Key features

- Principle: Double superheterodyne, IF 21.4 MHz, 455 kHz
- 1st IF breakdown: > -46 dB
- Operating mode: AM (A3E)
- Frequency range: 100 kHz - 30 MHz
- Frequency display: 5" TFT LCD display, 480 x 272 pixels, resistive touchscreen
- Frequency memory: 50 presets
- Signal strength indicator: Single LED
- Intermodulation IM3: +20 dB, 17.600 MHz - 10 dBm, 17.610 MHz - 10 dBm
- Sensitivity: 100 kHz - 30 MHz, 12 dB S/N at -101 dBm, modulation 1 kHz, 80%
- Selectivity: 6 kHz (+/- 3 kHz 6 dB)
- Power supply: 11 - 15 V DC, 360 mA
- Dimensions: Width 305 mm diameter, 120 mm height, 185 mm depth
- Weight 1.7 kg
- Local oscillator: SI5351, 30 MHz TCXO



YouTube

Instructions can be found on YouTube at:

www.youtube.com/watch?v=Tvcj9M8n1yU

Kit description

STRESSLESS is an AM receiver primarily designed for receiving LW, MW, and SW broadcast bands. It is a modular receiver kit consisting of a housing, VFO, and receiver module.

It is aimed at technology enthusiasts, novices, beginners, and discerning SW listeners. All mounting holes are pre-drilled in the housing, and the aluminum housing shells are painted in RAL 7035.

The VFO module and the receiver module were tested and calibrated.

Assembly primarily involves mounting work. Suitable Torx and hex screwdrivers are included. Only minimal soldering is required to complete the device, significantly reducing assembly time.

Technical description

A five-stage preselector suppresses image frequencies and FM interference. A preamplifier is not used. The slight step-up transformation provides several dB of sensitivity gain. The secondary side is terminated with 180 ohms. With a turns ratio of 1:2.5, this results in a good match to the preselector output.

A relay-controlled attenuator is located before the mixer. Due to the high large-signal handling capability, it is unlikely that this will ever need to be activated. The balanced circuitry of the mixer provides an additional 3 dB of dynamic range. A dual-balanced mixer from Analog Devices with a high dynamic range is used.

From the antenna connector to the mixer output, the signal level increases by 5 dB. This 5 dB is absorbed by the diplexer (–1 dB) and the crystal filter (–4 dB). The diplexer terminates the frequencies reflected by the crystal filter with 50 ohms, thus counteracting intermodulation distortion. L234 (2.2 μ H) and C35 (22 pF) form a matching network for the 8-pin crystal filter. The crystal filter exhibits excellent attenuation in the stopband and suppresses reception at a frequency offset of 910 kHz from the receiving frequency.

After the intermediate frequency passes through the crystal filter, a bandwidth of 12 kHz remains. The second local oscillator is generated using a 20.945 MHz crystal in the A4100D. Fine-tuning can be achieved by adjusting coil L2.

In the second mixer (TDA4100D), the 21.4 MHz intermediate frequency and the second local oscillator at 20.945 MHz are combined. The resulting difference of 455 kHz is output at pin 4. LC1 suppresses the sum of $21.4 \text{ MHz} + 20.945 \text{ MHz} = 42.345 \text{ MHz}$. Furthermore, the conversion ratio of LC1 to R24 (1 kilohm) ensures matching to the ceramic filter. The ceramic filter provides near-field selectivity.

IF gain, AGC control, demodulation, audio filtering, and preamplification are performed internally by the A4100D. The relative signal strength is indicated by the (field) LED.

The low-frequency output is delivered to the 3.5 mm stereo headphone jack via a transformer.

The VFO features a precise reference frequency oscillator (TCXO).

THERE IS NO WARRANTY FOR THE KIT
If short circuits and smoking heads occur please use "FIRST AID!"



UUUPS! SHORT, MALFUNCTION, PROBLEMS? - FIRST AID (HELP INSTRUCTION GUIDE)

1. Write a detailed Report
2. Make Photos of your kit and attach it to the E-mail 2x (front and back of the print)
3. Initiate calming measures
4. Wait for Help

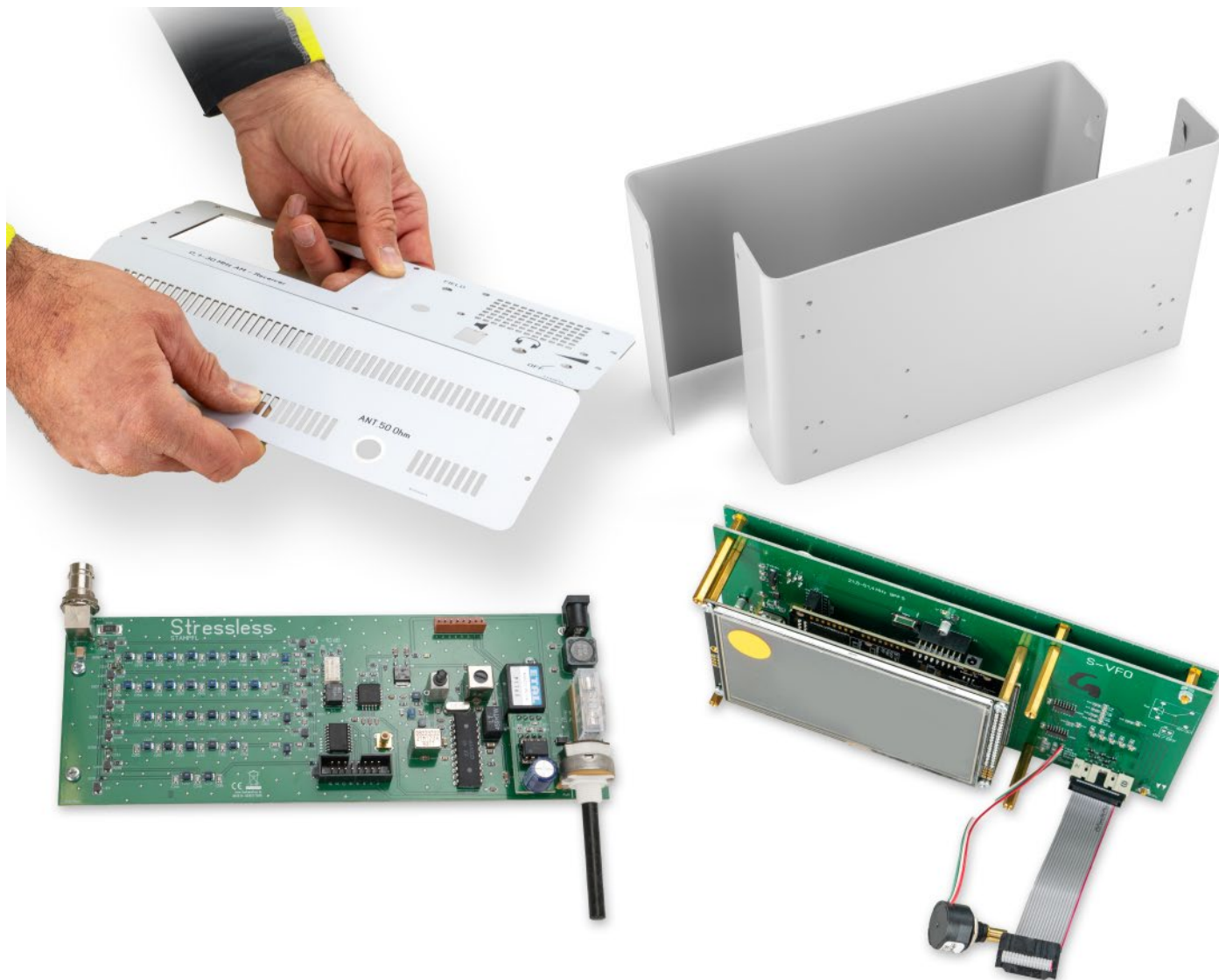
E-MAIL ADDRESS
info@heinzstampfl.ch



Parts list 1/2



Parts list 2/2



1x axle coupling
 1x axle extension
 4x threaded studs, hex socket, M4 x 4 mm
 1x rotary knob (17 mm diameter)
 1x rotary knob cap (red)
 1x Torx angle screwdriver (T10)
 1x hex angle screwdriver (1.5 mm)
 1x hex angle screwdriver (2 mm)
 1x tuning knob with finger groove (32 mm diameter)
 1x pre-assembled SMB coaxial cable (200 mm length)
 1x 3.5 mm stereo headphone jack
 1x M10 x 3 mm aluminum washer
 1x 8-pin straight PCB connector, brown

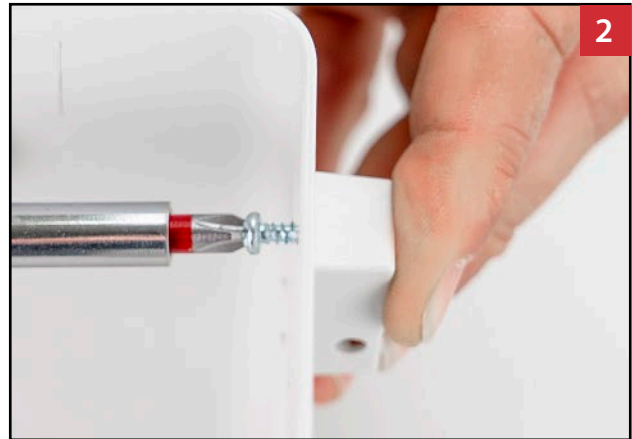
1x spare fuse 3.15 A
 4x cable ties
 1x 8 Ohm speaker
 1x bottom housing shell
 1x top housing shell
 1x front housing panel
 1x rear housing panel
 1x VFO module
 1x receiver module
 1x 2m DC cable 5.5 x 2.1 mm
 1x rocker switch
 1x heat shrink tubing

4x Phillips-head pan head screws M4 x 10 mm
 4x M4 washers
 4x M4 hex nuts
 1x LED signal light
 4x plastic feet
 4x rubber inserts
 2x folding feet
 4x M3 x 10 mm pan head screws for plastic
 16x M3 x 10 mm Torx pan head screws
 8x M3 x 5 mm Phillips-head pan head screws (6 extra)
 4x aluminum brackets

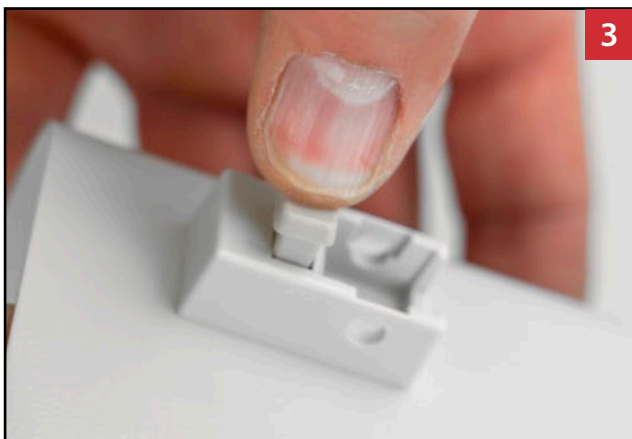
Assembly instructions 1/5



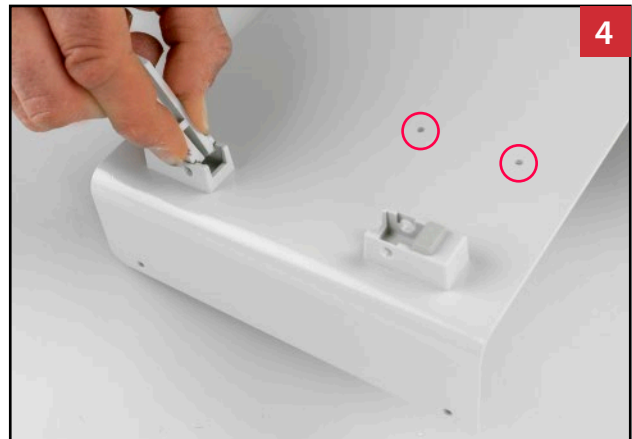
Remove 8 protective covers from the housing shells.



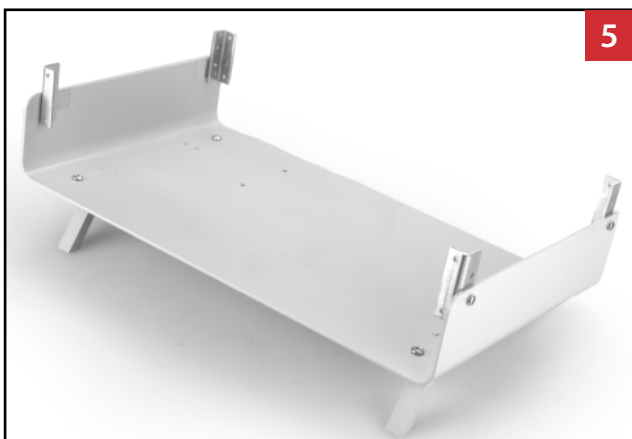
Attach 4x plastic feet using 4 x M3 x 10 mm pan head screws for plastic.



Press in 4 rubber stoppers



Snap the two folding feet onto the front feet of the device (press them together slightly). Back

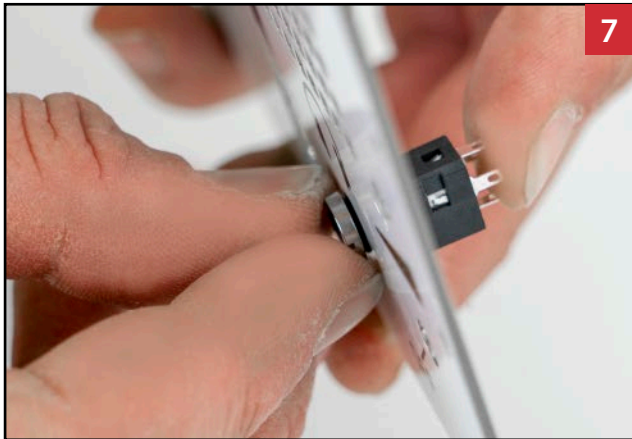


Attach four aluminum brackets to the lower housing shell using four Torx M3 x 10 mm countersunk screws. A Torx angle screwdriver (T10) is included. Tighten the self-tapping screws carefully.

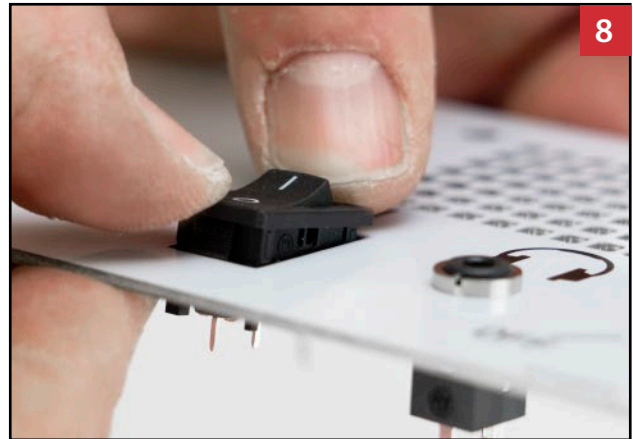


Separate the front and rear panels of the housing.

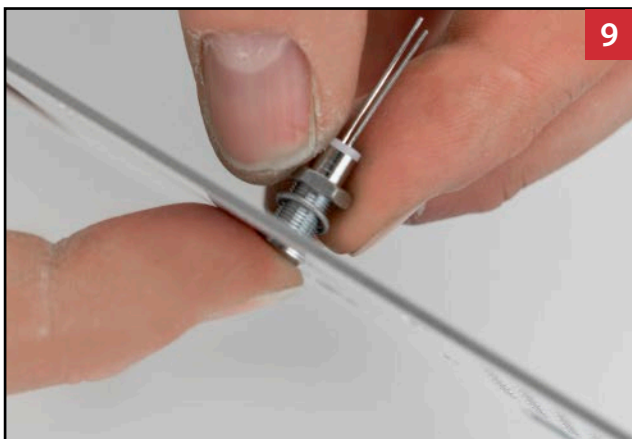
Assembly instructions 2/5



Install 1x 3.5 mm stereo headphone jack.



Snap one rocker switch into the front panel.



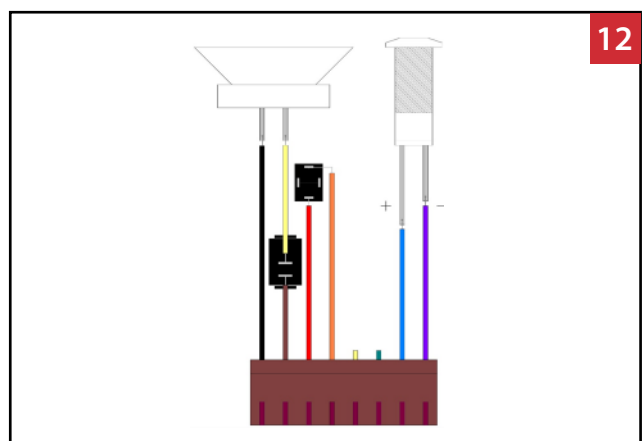
Mount 1x LED signal light.



Mount 1x the front housing panel to the lower housing shell using 2x Torx M3 x 10 mm pan head screws.

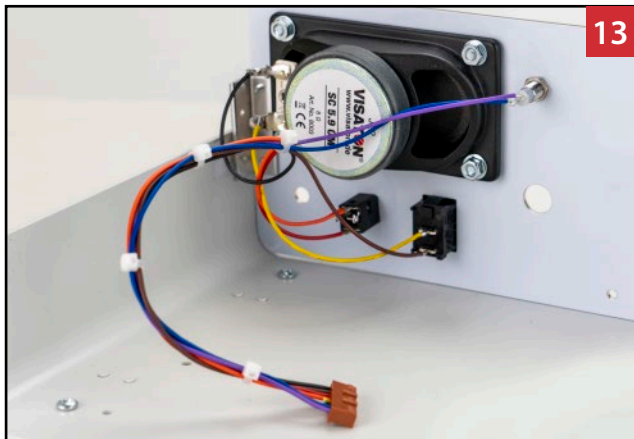


Mount the speaker to the front panel using 4x M4 x 10 mm Phillips head screws, 4x M4 washers, and 4x M4 hex nuts. The solder tabs should face outwards.
Before tightening, slide the speaker as far as it will go against the aluminum bracket.

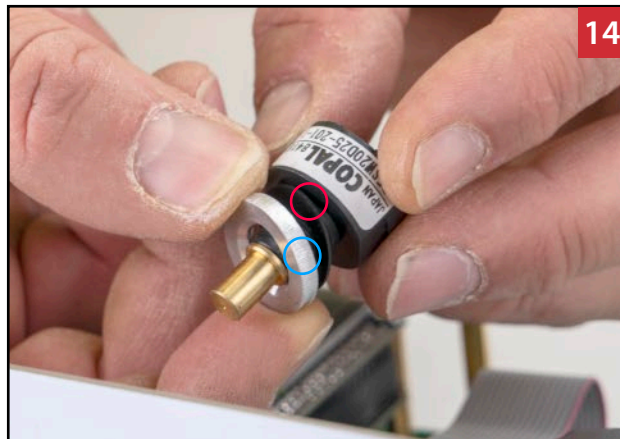


Prepare the wiring for the speaker, headphone jack, and field LED. Cut off the yellow and green wires at the circuit board connector. Do not shorten the wires.

Assembly instructions 3/5



Use 4 cable ties to pull the strands together.



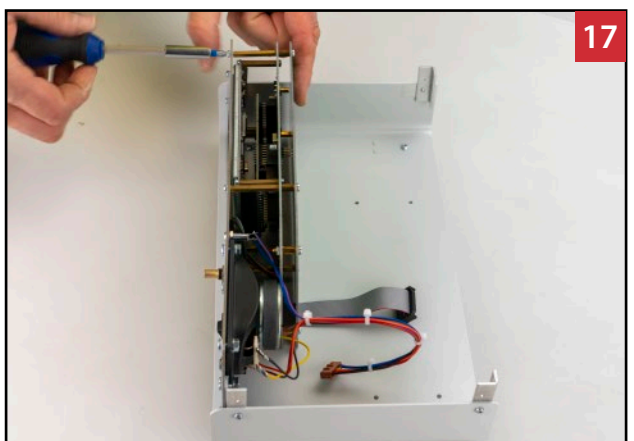
The rubber and aluminum washer M10 x 3 mm goes between the front plate and the encoder.



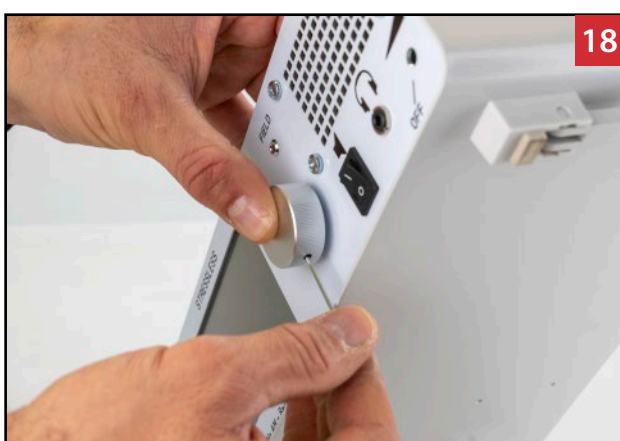
Only lightly tighten the encoder's hexagonal nut!



Remove the protective film from the display.



Mount the VFO module using 4x M3 x 5 mm cross-head pan head screws.



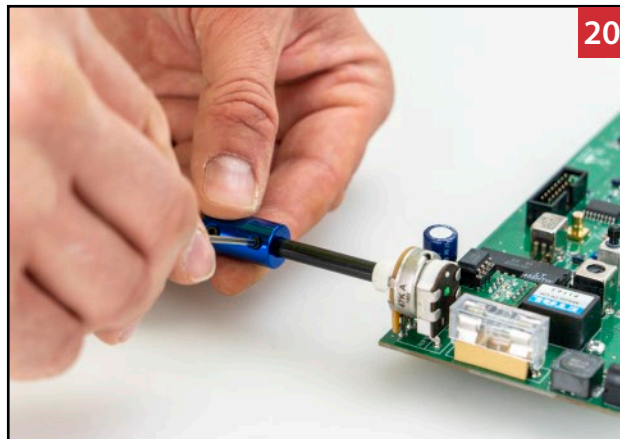
Mount the tuning knob. A suitable 6-point angled screwdriver (1.5 mm) is included.

Assembly instructions 4/5



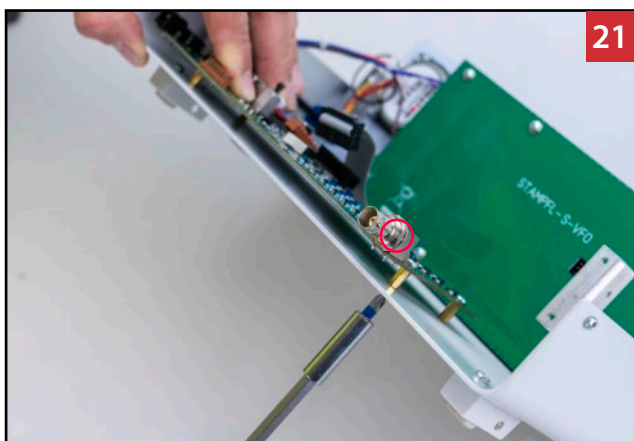
19

Screw 4x threaded studs In-6Kt M4 x 4 mm into the axle coupling using the 6-point angle screwdriver (2 mm) (included).



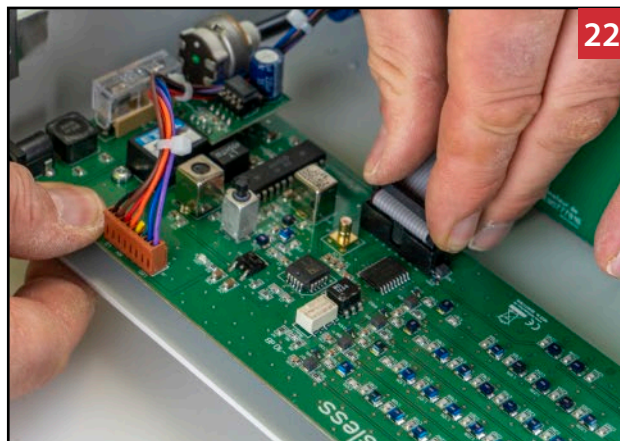
20

Mount the axle coupling on the receiver module.



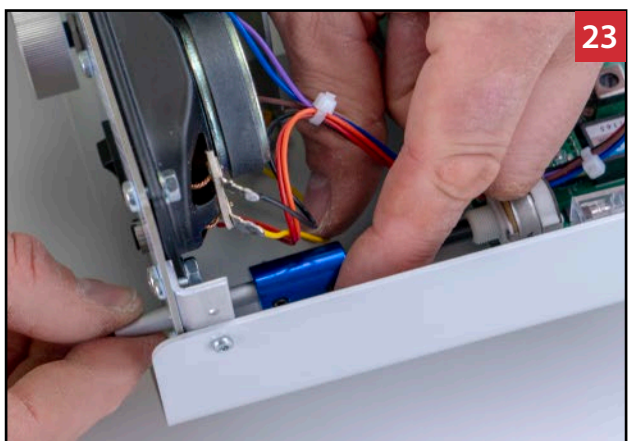
21

Insert the receiver module using 4x M3 x 5 mm Phillips head countersunk screws. Unscrew the hex nut and washer.



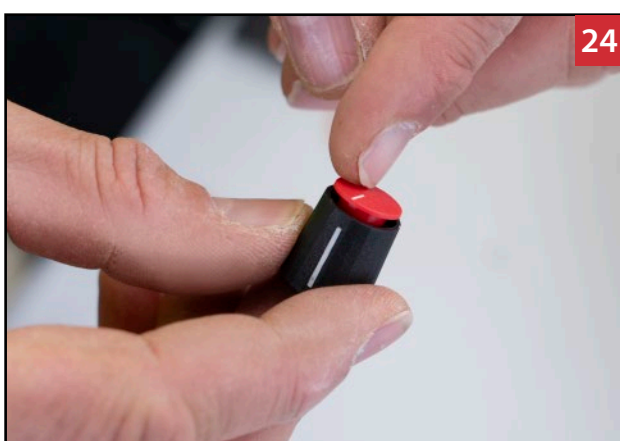
22

Connect the circuit board connector and the ribbon cable.



23

Install axle extension.



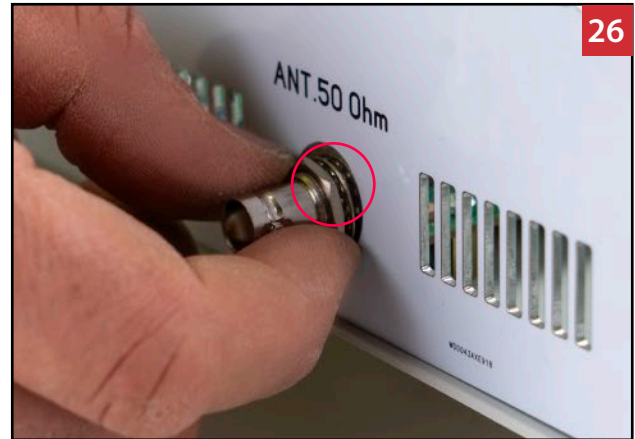
24

Mount the rotary knob and cap.

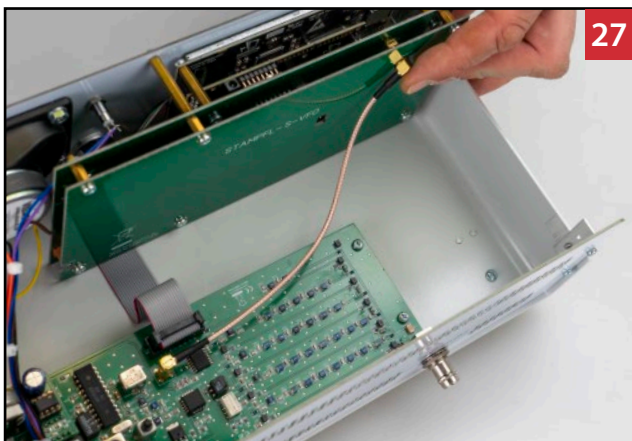
Assembly instructions 5/5



Secure the back of the housing with 4x Torx M3 x 10 mm pan head screws.



Screw the 6-sided nut and washer back on.



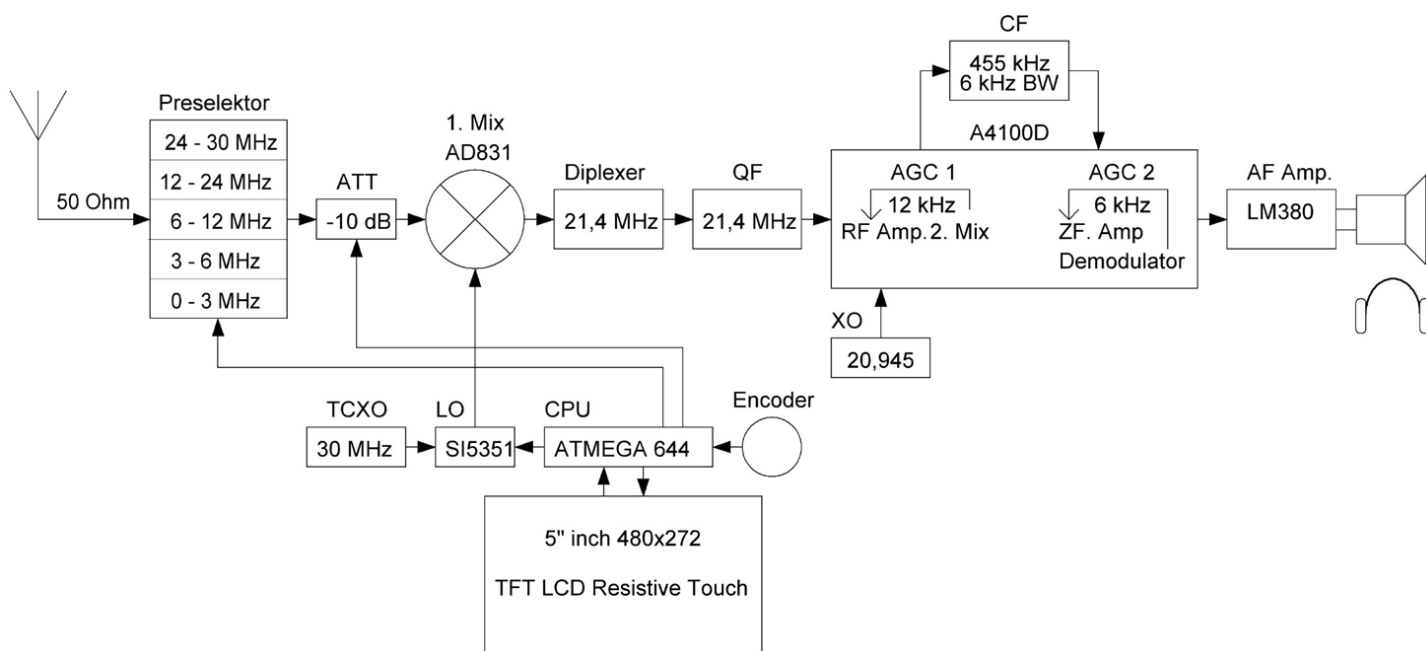
Connect the receiver board to the VFO module using a coaxial cable.



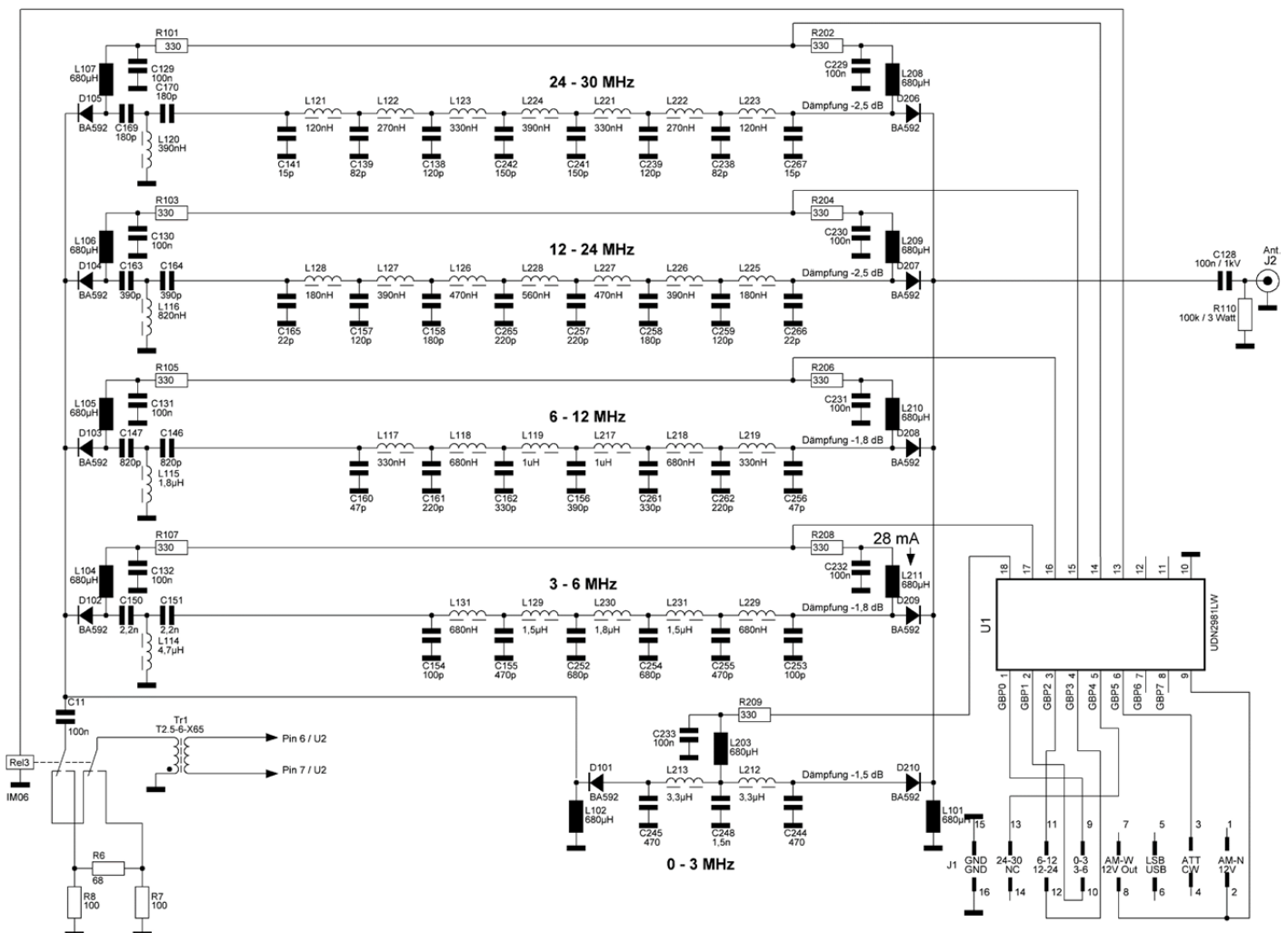
The receiver is now ready for use.

Never use discarded PC power supplies as a power source. These can severely interfere with reception. For good reception, the antenna must be located in an environment with as little interference as possible. Computers, solar panels, and especially power line modems are sources of interference!

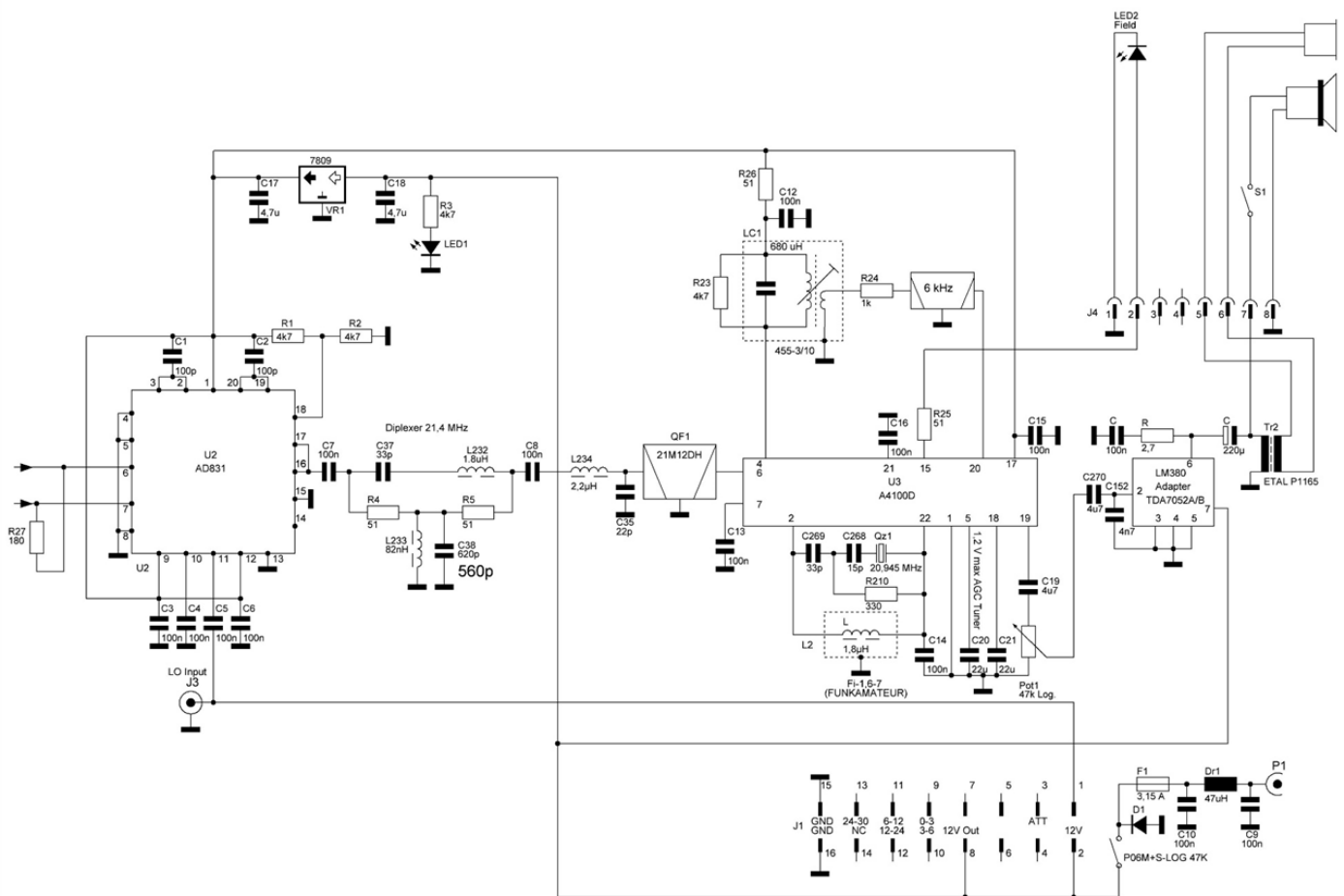
Block diagram



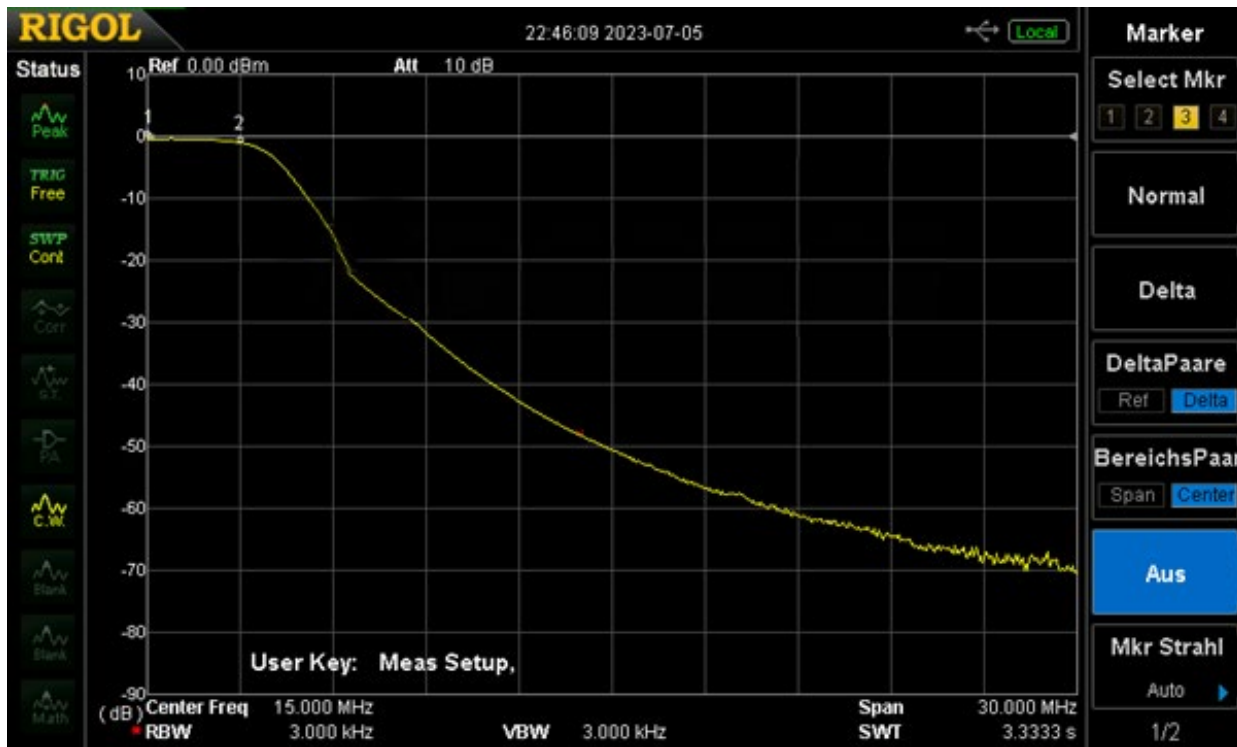
Bandpassfilter / ATT



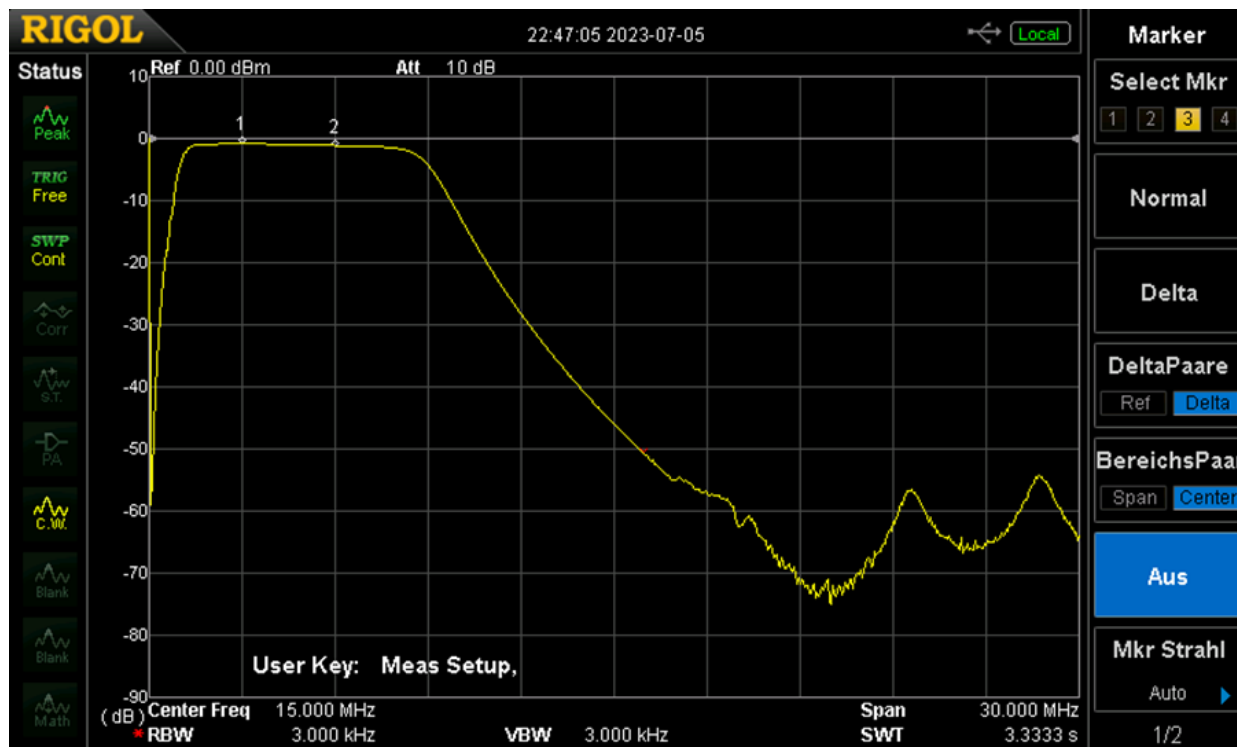
Mixer / Diplexer / Demodulator / Audio



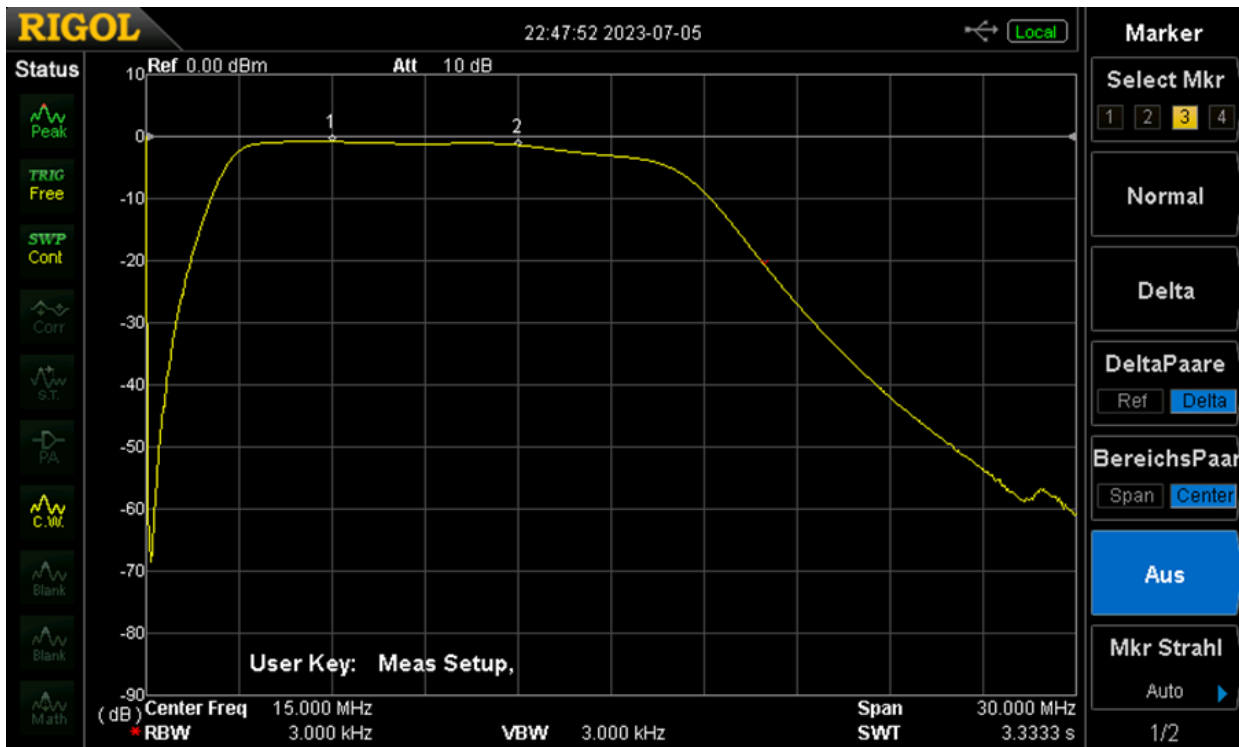
0-3 MHz



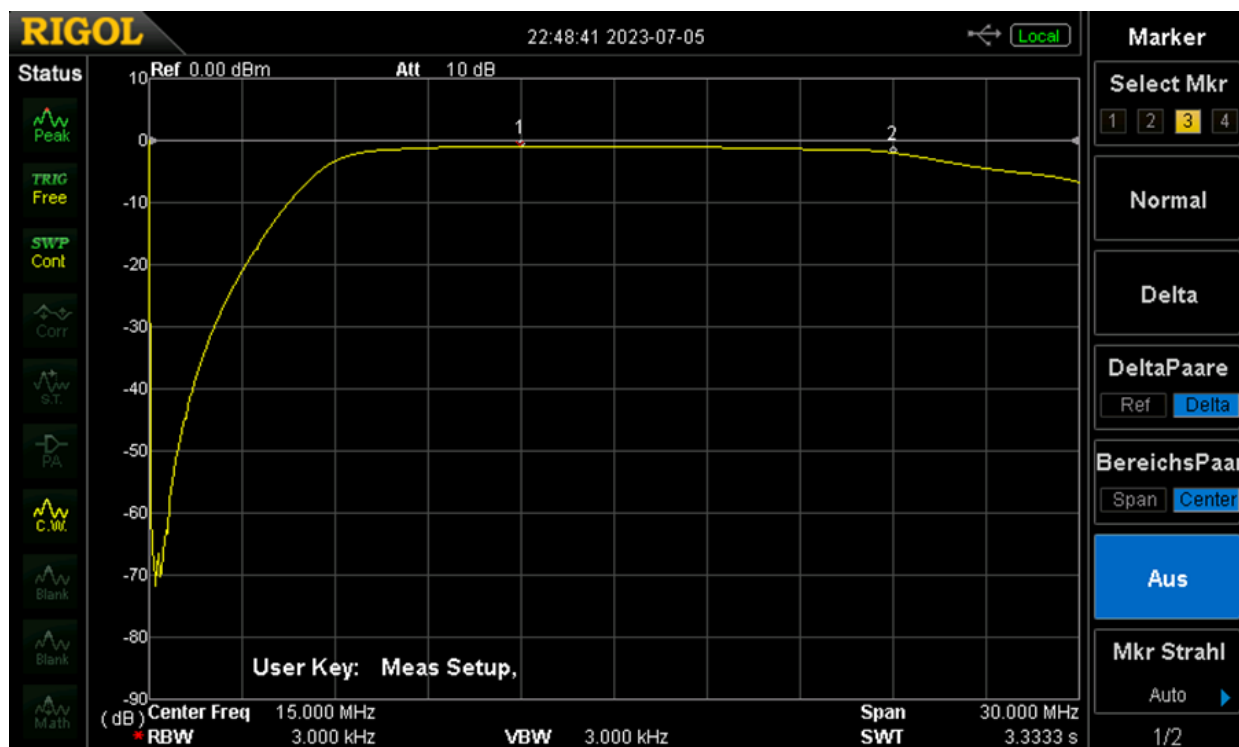
3-6 MHz



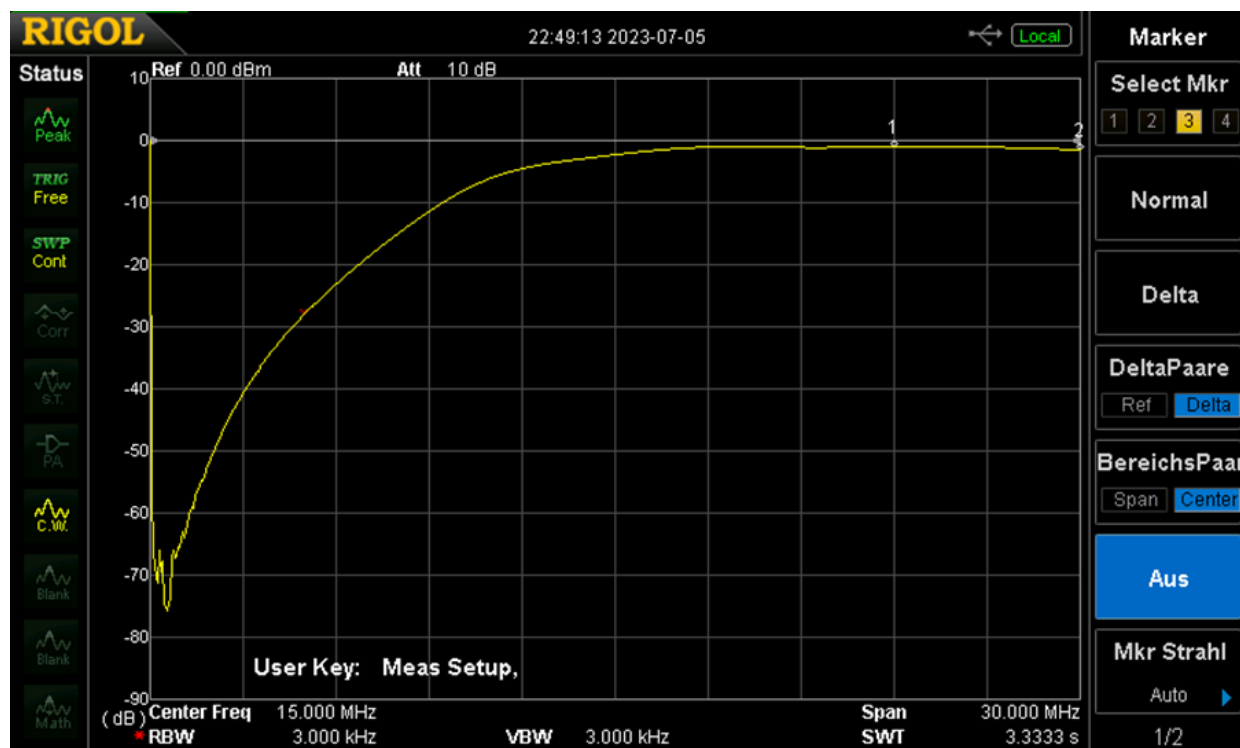
6-12 MHz



12-24 MHz



24-30 MHz



Recommended accessories

STAMPFL X ONE

ACTIVE DIPOL

90 kHz - 150 MHz



Specifications

Frequency range:	90 kHz bis 150 MHz
Polarisation:	Horizontal
power supply:	12 – 14 Volt / 270 mA
RF connection:	N inkl. BNC-Adapter
length:	0,8 m
Weight:	900 g