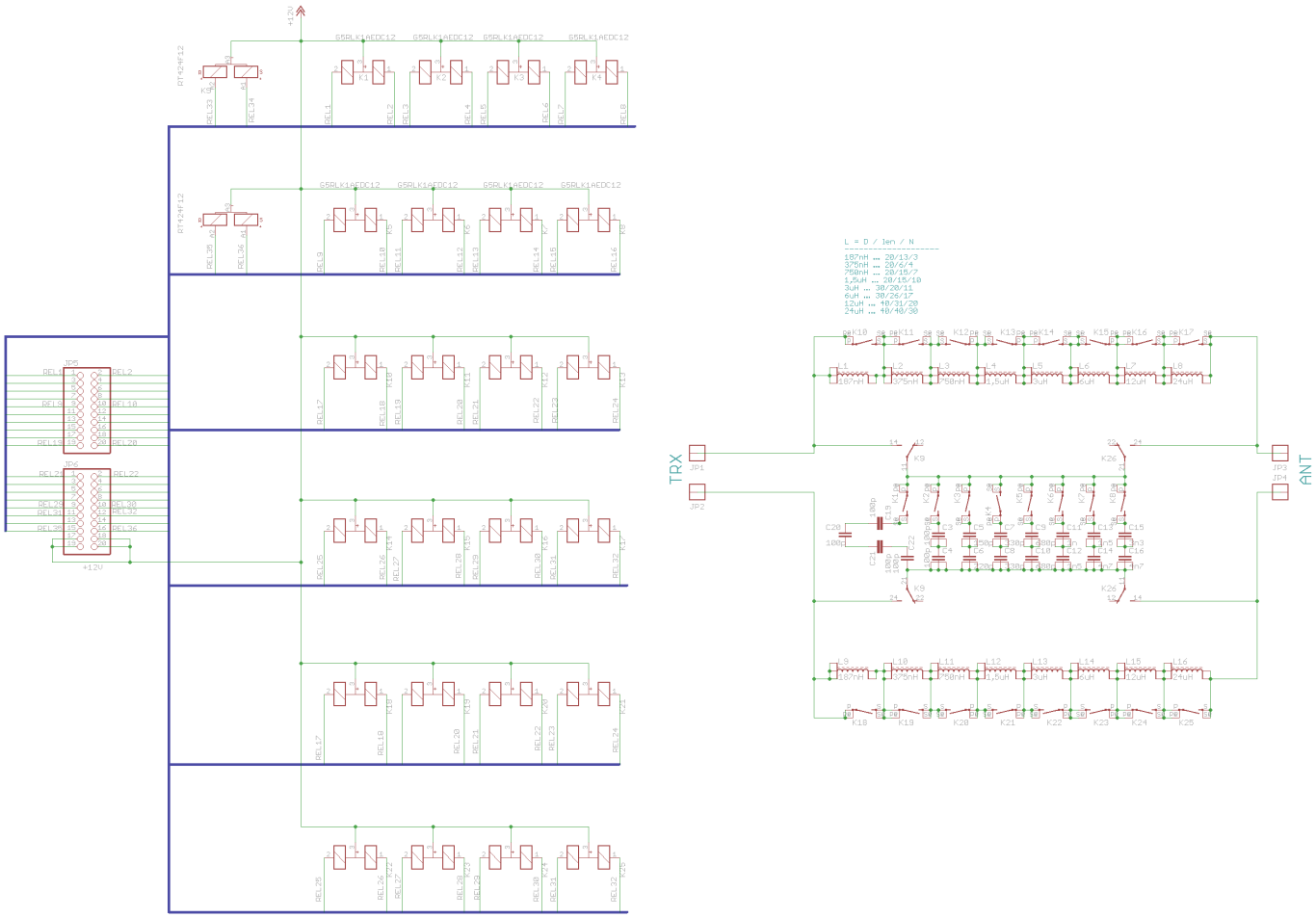
Symmetrical (and asymmetrical) remote-controlled and affordable kilowatt KW antenna tuner

Relay board:



the antenna is matched by a symmetrical L-element as a low pass.

The capacitors are FKP1 film capacitors with 2kV. Except for extremely bad antennas, the tuner should withstand 2kW well. The coils are designed exclusively as air-core coils for the highest quality. This high quality is very important for the quality of a tuner. Commercial tuners mostly use toroidal cores which, however, bring additional iron losses with them, which we do not want in the do-it-yourself tuner. I made all the coils with CuL wire 1.32 sqmm. The two largest coils were wound on a bobbin made of thin plastic, the other coils are stable enough even without a body. After calibration with an LC meter, the coils were sealed with silicone varnish.

The circuit board layout is designed so that the air coils are always mounted at a 90 degree angle so that they do not influence each other.

26 bistable relays switch the adapter elements (8x capacitors, 16x coils and 2 relays to switch the capacitors to the input or output).

As soon as the relays are switched they no longer need any electricity. Therefore the power consumption of the tuner from the 12V supply is very low.

The balancing of the 50 ohm coaxial cable to the balanced tuner input is not shown in the circuit diagram. It is just a ferrite ring core (e.g. the popular FT240-43) which is fully wound with two identical windings (1: 1). For this I wound up 2-pole speaker cable (approx. 2.5 sqmm). One winding is the input, the other is the output. That works great and can easily withstand 750 watts.