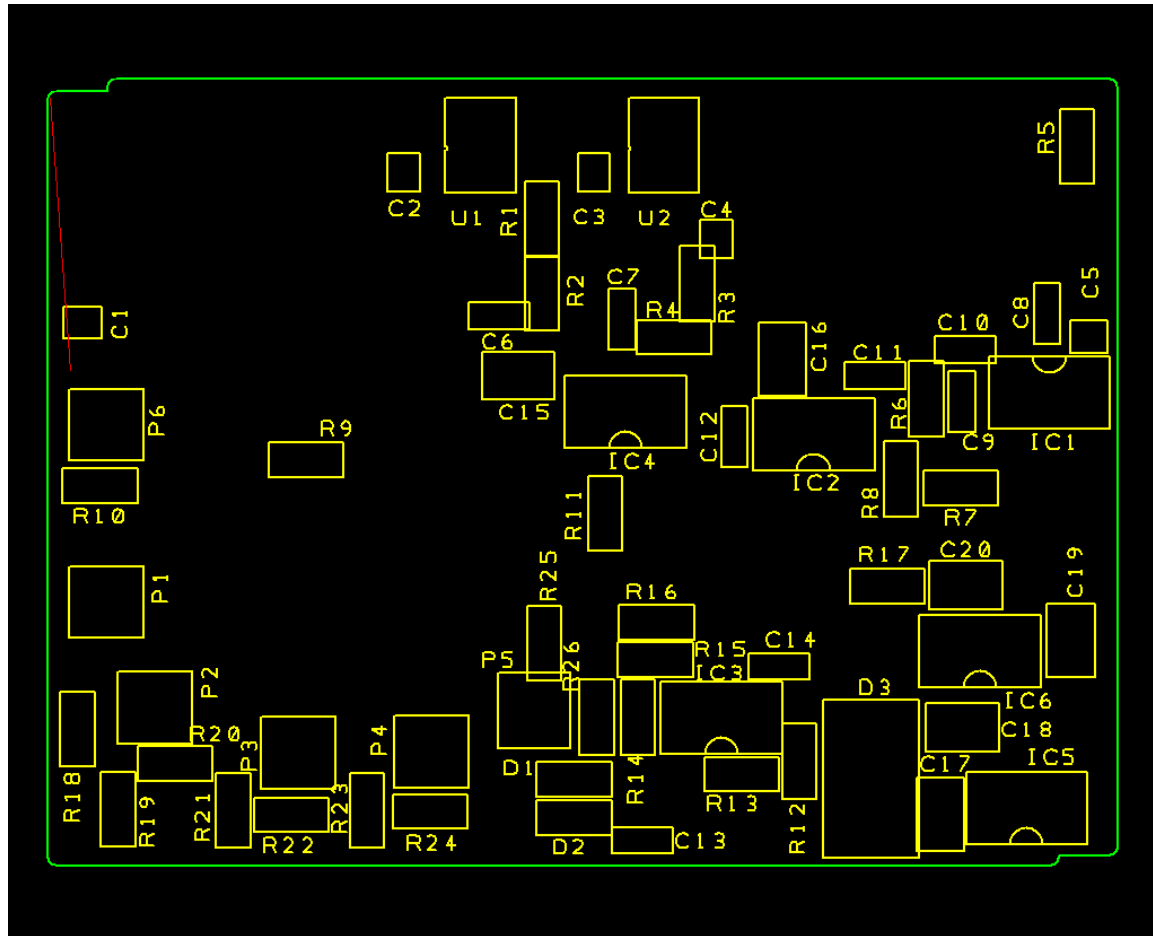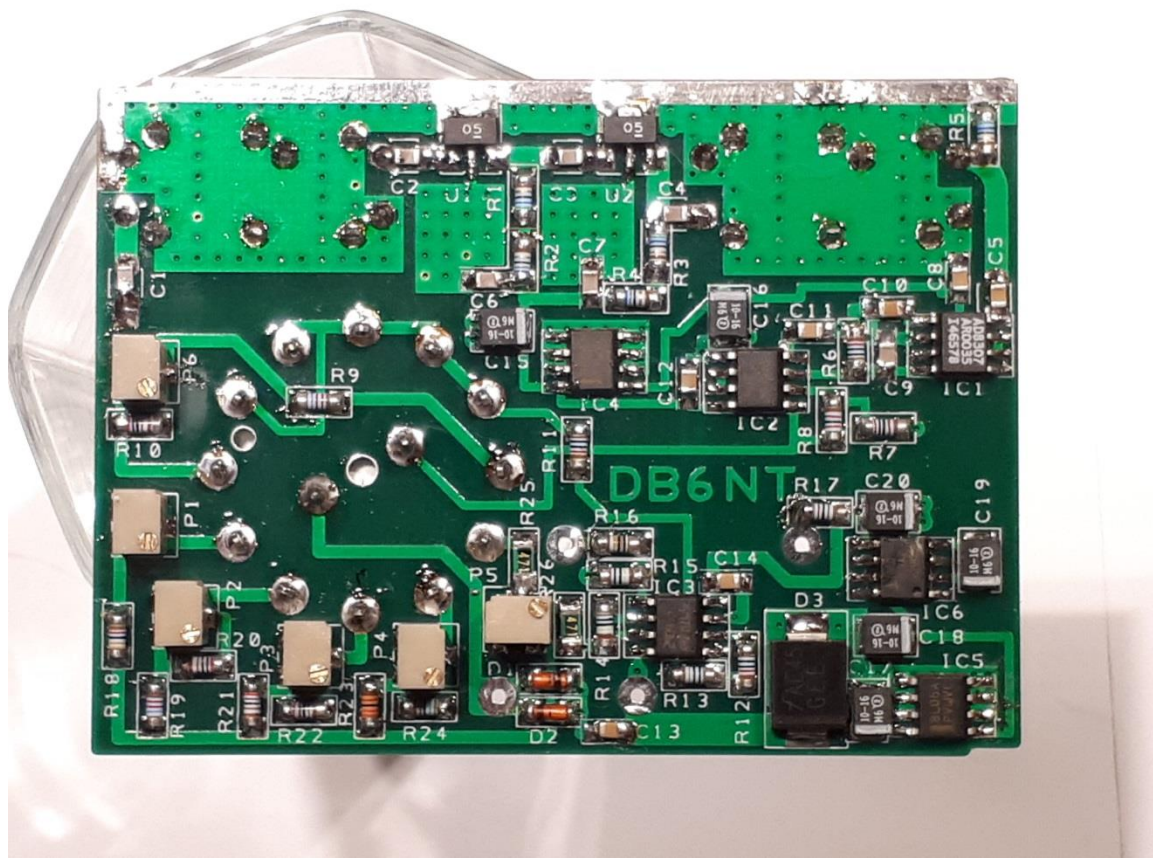# Moon Noise Meter
DB6NT 5.2018

The dB linear display instrument described below is based on the publication of VK3NX. The circuit was somewhat modified, supplemented and a circuit board was designed for it. I needed a device to detect the sun and moon noise for my own EME rig. It is a great help and hardly to recall during the practical EME operation.

The device is connected to the transverter (10 GHz to 144 MHz IF) via a 3 dB coupler. The gain of the transverter with additional external preamplifier is about 32 dB. This amplification is enough to get into the linear display range of the measuring device.
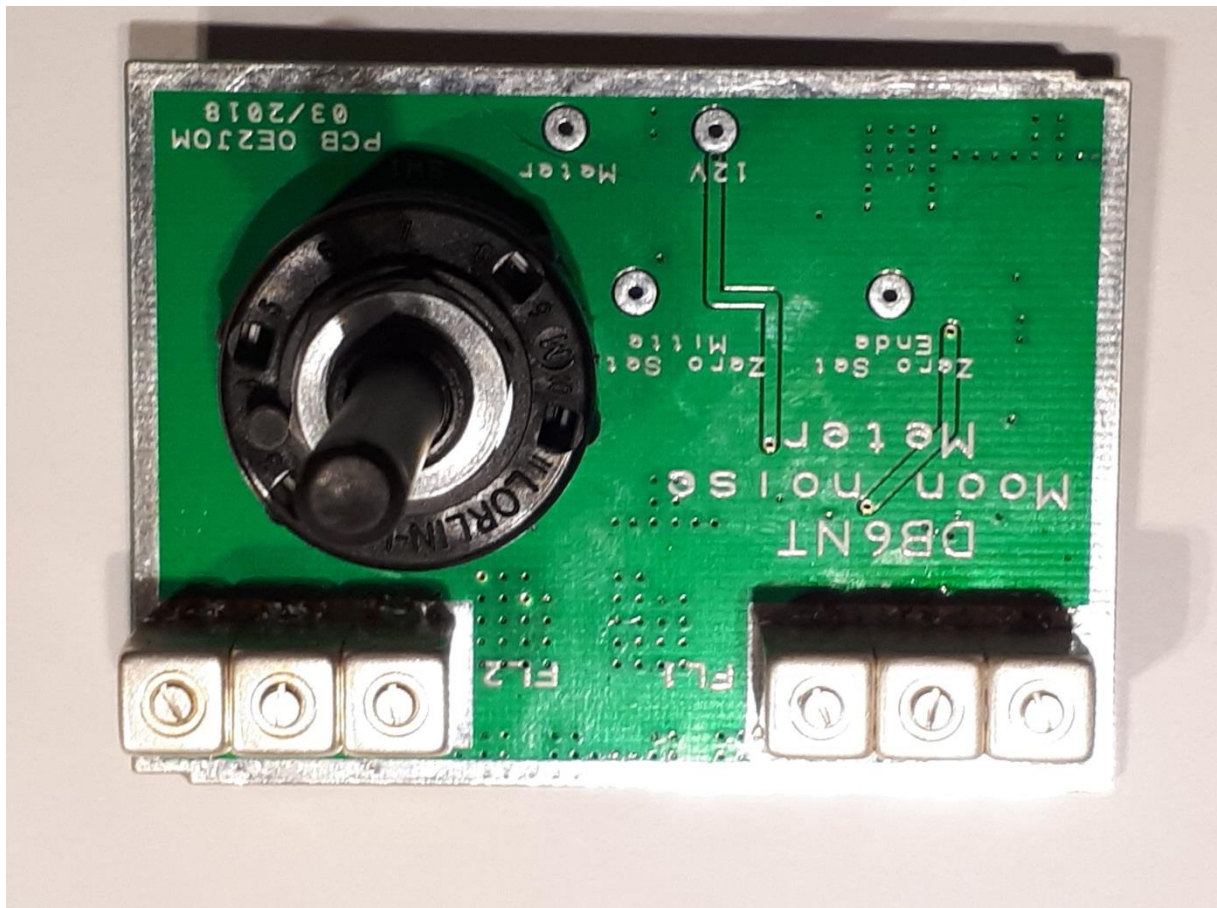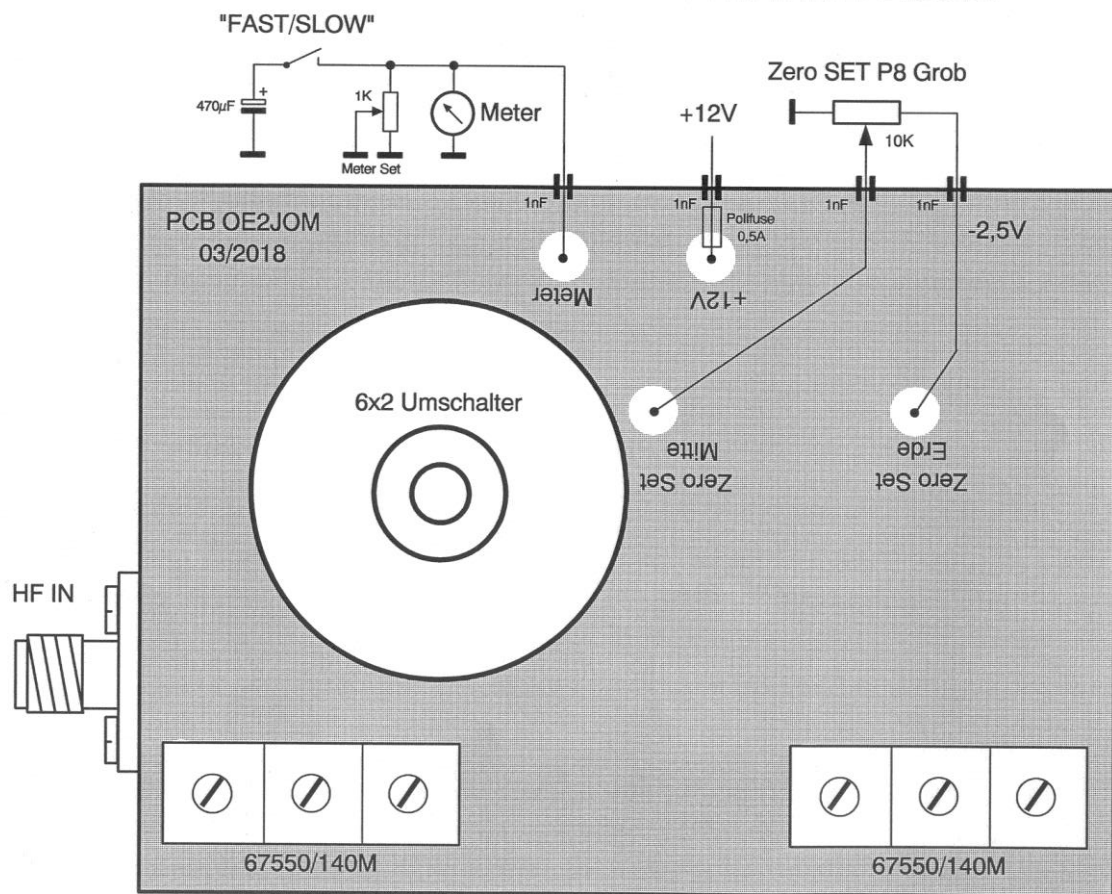
Circuit description:
The incoming receiver noise is fed via two helix filters for band selection and two MMICs for amplification to the actual log. Detector IC. The following OP amplifier stages are used for level and offset adjustment.

The measuring ranges can be switched by a six-pole rotary switch. This information is related to the display range of the measuring system. That means, when the "P8 Grob" Helipot sets the measuring device to "zero", the corresponding higher levels in dB are displayed when the noise level is increased. The potentiometer "P9 Zero Set" is used for fine adjustment of the zero point, but is not absolutely necessary.

Construction:
The circuit board is made of 1mm Epoxi material which is soldered into a tinplate case. For this, the circuit board has to be drilled and cut accordingly. The circuit is installed in a Schubert sheet metal case Nr. 5.   55 x 74 x 30 mm. The voltage supply is via a socket on the back of the case.

Adjustment:
First, the measuring instrument is set to 300 µA with the limit switch connected in parallel with the limit switch. The measuring device is not yet connected to the rest of the circuit. Then the input is fed by a TX-measuring instrument at -70 dBm at 145 MHz. Now the helix filters are adjusted to maximum. This adjustment takes place by means of reciprocating rotation on the filter screws. The DB switch is initially set to "FULL". After this adjustment, the voltages specified in the circuit diagram can be measured. The individual measuring ranges are then calibrated with the setting controllers provided for this purpose. For this, the measuring transmitter, which, of course, has a corresponding setting accuracy must be used.

"FAST/SLOW"

470µF

1K

Meter Set

Meter

Zero SET P8 Grob

+12V

10K

-2,5V

PCB OE2JOM
03/2018

1nF   1nF   Polifuse
              0,5A

1nF   1nF

Meter   +12V   Zero Set
                 Mitte

Zero Set
Erde

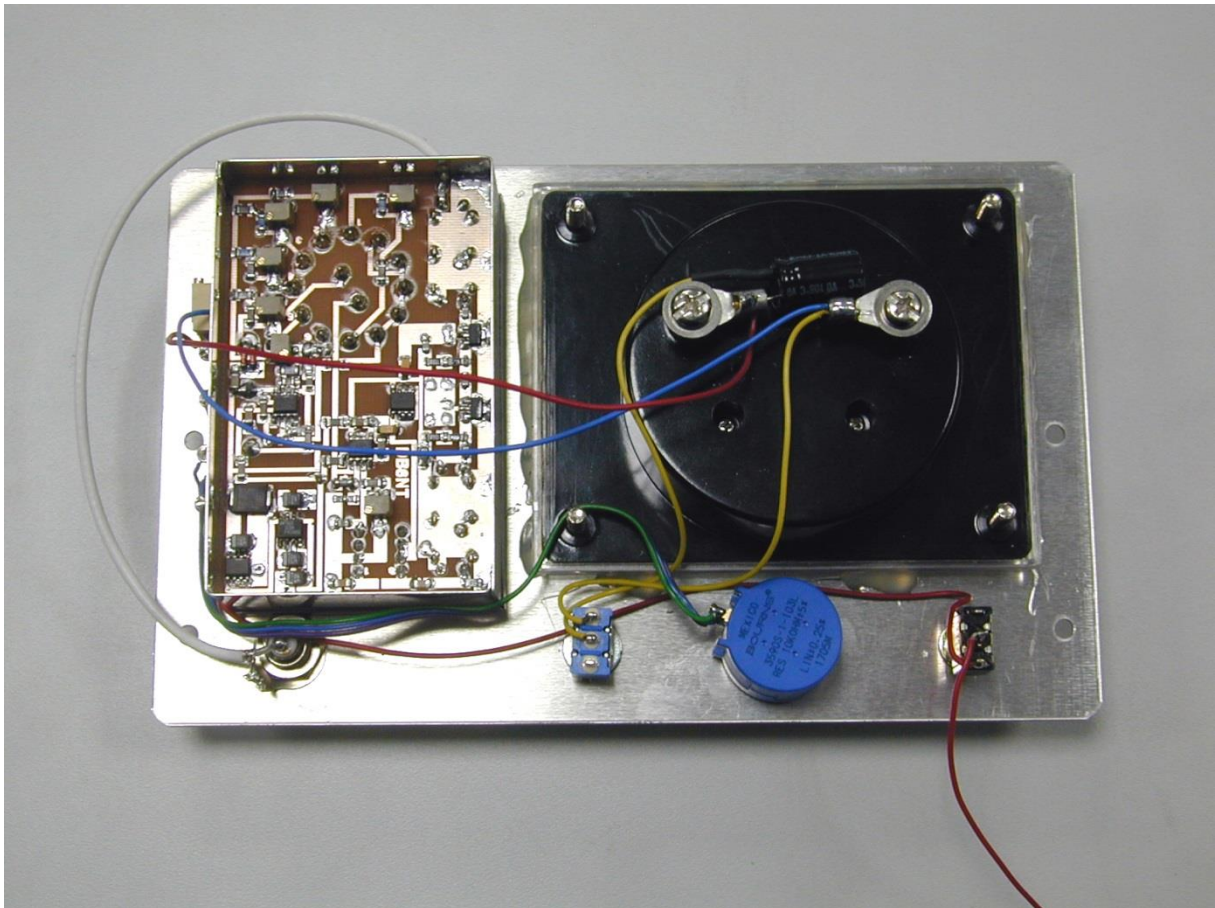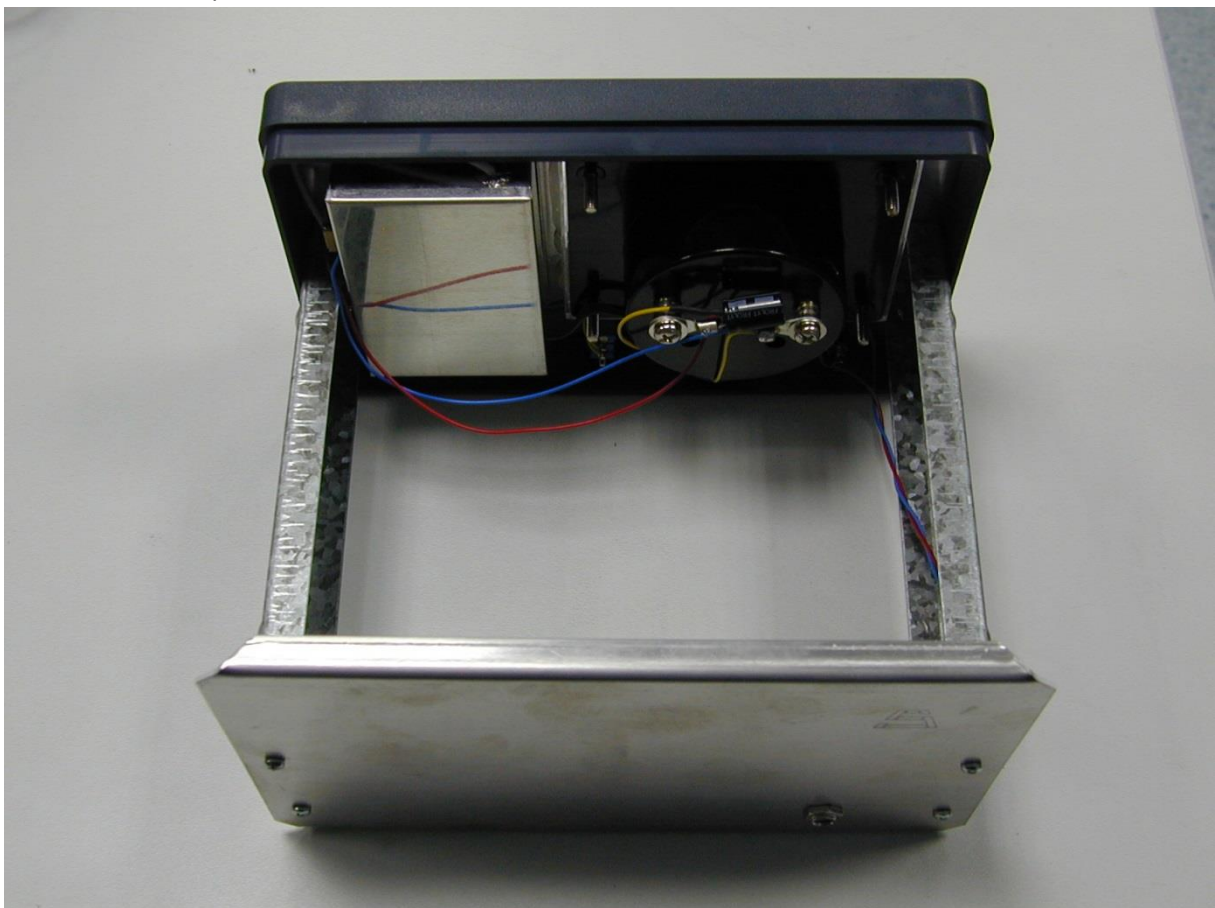6x2 Umschalter

HF IN

67550/140M

67550/140M

Back of the front panel with the first version of the PCB.

Installation in a Schubert Case Nr. 201

My special thanks to Hans **OE2JOM** who has completely revised the circuit board.

Reference information:

Rotary switches:	Reichelt DS 2PC
IC:	Reichelt AD8307 SMD SO8 Version
diode:	SMCJ12A Mouser
adjusting controller:	Bürklin 10K 66E8698
	5K 66E8696
Helixfilter:	Temwell TT6755D-140M
	Suitable filters are available in our ebay shop:
	https://www.ebay.de/usr/kuhneelectronic
Circuit board:	DB6NT db6nt@gmx.de
Case:	Schubert Typ. 201
Measurement instrument:	SEW Model ST-100R 100µA, or others with 100µA.

All other components are commercially available and can be obtained from various dealers.

Literature notes:

VK3NX: A Noise Meter Suitable for Sun & Moon Noise Measurements www.vk3nx.com/EME.html

			Stückliste Moon Noise Meter DB6NT				Mrz 18	
Bez.	Wert	Bauform	Lieferant	Best.Nr.	Bez.	Wert	Bauform	Lieferant
C1	1n	805	diverse		R1	56R	1206	diverse
C2	1n	805	diverse		R2	68R	1206	diverse
C3	1n	805	diverse		R3	56R	1206	diverse
C4	1n	805	diverse		R4	68R	1206	diverse
C5	100n	805	diverse		R5	56R	1206	diverse
C6	1n	805	diverse		R6	10k	1206	diverse
C7	1n	805	diverse		R7	20k	1206	diverse
C8	100n	805	diverse		R8	82k	1206	diverse
C9	1n	805	diverse		R9	18k	1206	diverse
C10	100n	805	diverse		R10	2k7	1206	diverse
C11	100n	805	diverse		R11	10k	1206	diverse
C12	100n	805	diverse		R12	10k	1206	diverse
C13	100n	805	diverse		R13	100k	1206	diverse
C14	100n	805	diverse		R14	1M	1206	diverse
C15	10µF	3528-18	diverse		R15	1M	1206	diverse
C16	10µF	3528-19	diverse		R16	100k	1206	diverse
C17	10µF	3528-20	diverse		R17	8k2	1206	diverse
C18	10µF	3528-21	diverse		R18	33k	1206	diverse
C19	10µF	3528-22	diverse		R19	18k	1206	diverse
C20	10µF	3528-23	diverse		R20	2k7	1206	diverse
C21	470µF		diverse		R21	2k7	1206	diverse
C30	1n	DUKO	diverse		R22	2k7	1206	diverse
C31	1n	DUKO	diverse		R23	1k2	1206	diverse
C32	1n	DUKO	diverse		R24	1k5	1206	diverse
C33	1n	DUKO	diverse		R25	470R	1206	diverse
P1	10k	SMD	Reichelt	44W-10k	R26	470R	1206	diverse
P2	5k	SMD	Reichelt	44W-5,0k	D1	LL4148	Mini Melf	diverse
P3	5k	SMD	Reichelt	44W-5,0k	D2	LL4148	Mini Melf	diverse
P4	5k	SMD	Reichelt	44W-5,0k	D3	TAZ12V	DO214AB	diverse
P5	5k	SMD	Reichelt	44W-5,0k	SW1	2X6		diverse
P6	5k	SMD	Reichelt	44W-5,0k	SW2	Ein/Aus		diverse
P7	1k	TrimmPoti	diverse		FL1	TT6755D-150M		Temwell
IC1	AD8307	SO8	diverse		FL2	TT6755D-150M		Temwell
IC2	LM2904	SO8	diverse		U1	GALI 5	SOT89	Mini Circuits
IC3	LM2904	SO8	diverse		U2	GALI 5	SOT89	Mini Circuits
IC4	78L05	SO8	diverse		P8	10k	HeliPot 10Gang	diverse
IC5	78L05	SO8	diverse		Meter	100µA		diverse

Version with external 8V voltage regulator.

73 de DB6NT