

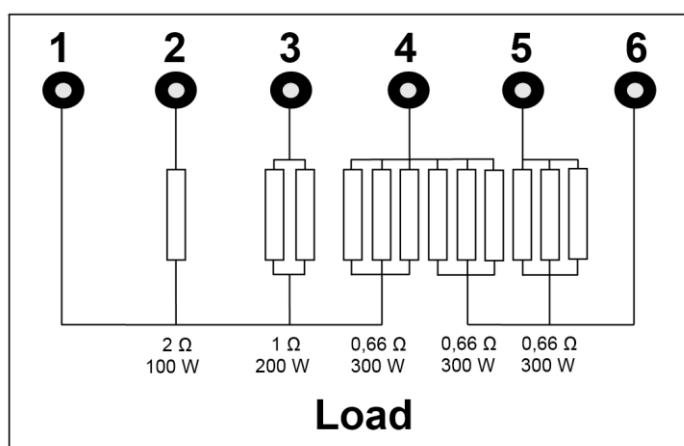
Homebrew DC Dummy Load

Matthias, DD1US, January 10th 2019

Recently I have been building some RF power amplifiers and thus needed also suitable DC power supplies. In order to test these power supplies, I decided to build a resistive load. I considered using light bulbs as the load but as they have a very low resistance when they are cold I decided to use power resistors instead.

The resistors are mounted on a large heatsink which is cooled by 2 strong fans. I built an enclosure to guide the airstream and thus to provide optimum cooling for the heatsink and the resistors. One fan is blowing cool air into the encasing, the other fan, on the opposite side of the encasing, is drawing the warm air out.

First, I used different power resistors I had on hand but finally decided to buy 12 pieces of 2 Ohms / 100 Watts resistors on Ebay in order to optimize the setup with respect to the maximum power dissipation. In order to be able to provide different loads, the resistors can be combined in various ways by using patch cables plugged into the respective jacks 1-6 on the front panel.

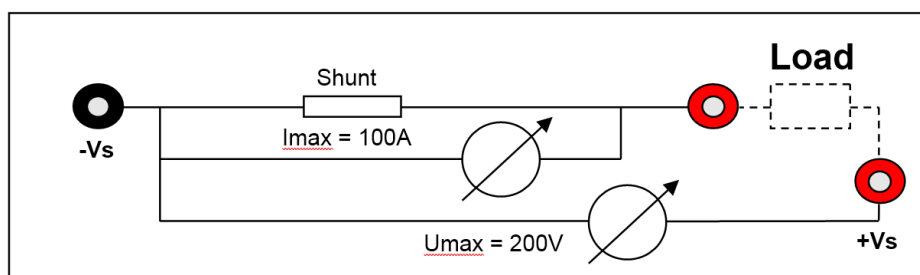


By different combinations of the resistors I can now get the following loads and respective currents at a different supply voltage:

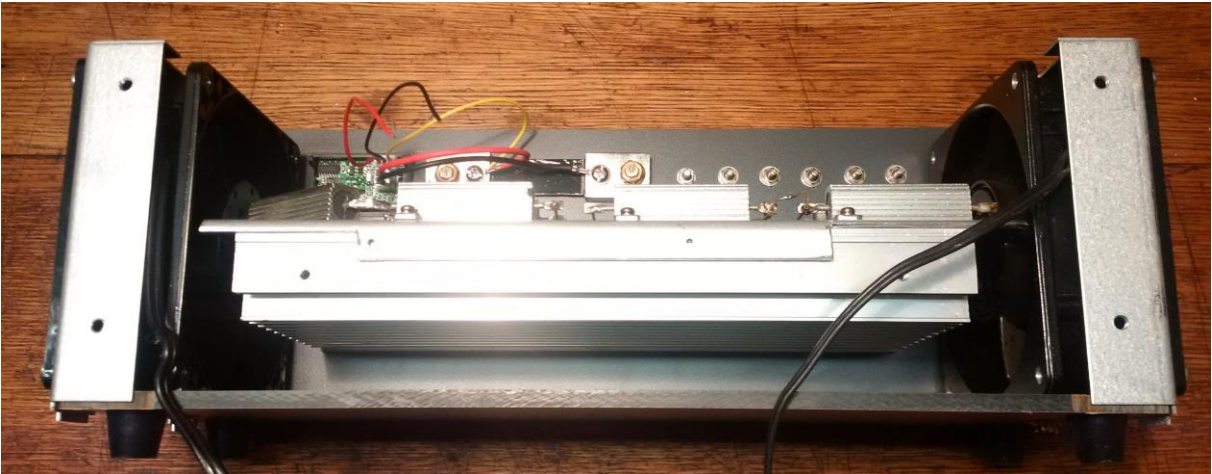
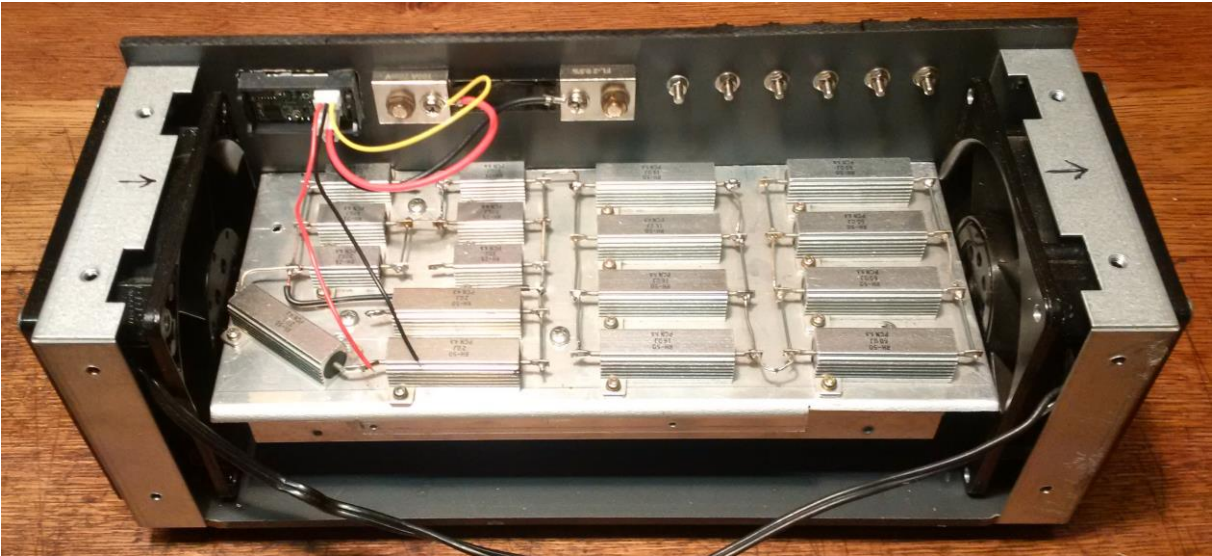
In Out Bridged	2 5	3 5	2+3 5	1 5	3 4	1 6	1 6 4+5	1 6 2+3+4+5	4+5 6	1+6 2+3+4+5
R	4 Ω	3 Ω	2,66 Ω	2 Ω	1,66 Ω	1,33 Ω	1,0 Ω	0,67 Ω	0,33 Ω	0,17 Ω
P max	200 W	600 W	1200 W	900 W	330 W	600 W	450 W	1200 W	600 W	1200 W
I @ 5 V	1,3 A	1,7 A	1,9 A	2,5 A	3,0 A	3,8 A	5,0 A	7,5 A	15 A	30 A
I @ 12 V	3 A	4 A	4,5 A	6,0 A	7,2 A	9,0 A	12 A	18 A	36 A	72 A
I @ 13,8 V	3,5 A	4,6 A	5,2 A	6,9 A	8,3 A	10 A	14 A	21 A	41 A	83 A
I @ 28 V	7 A	9,3 A	11 A	14 A	17 A	21 A	28 A	42 A	84 A	168 A
I @ 48 V	12 A	16 A	18 A	24 A	29 A	36 A	48 A	72 A	144 A	288 A

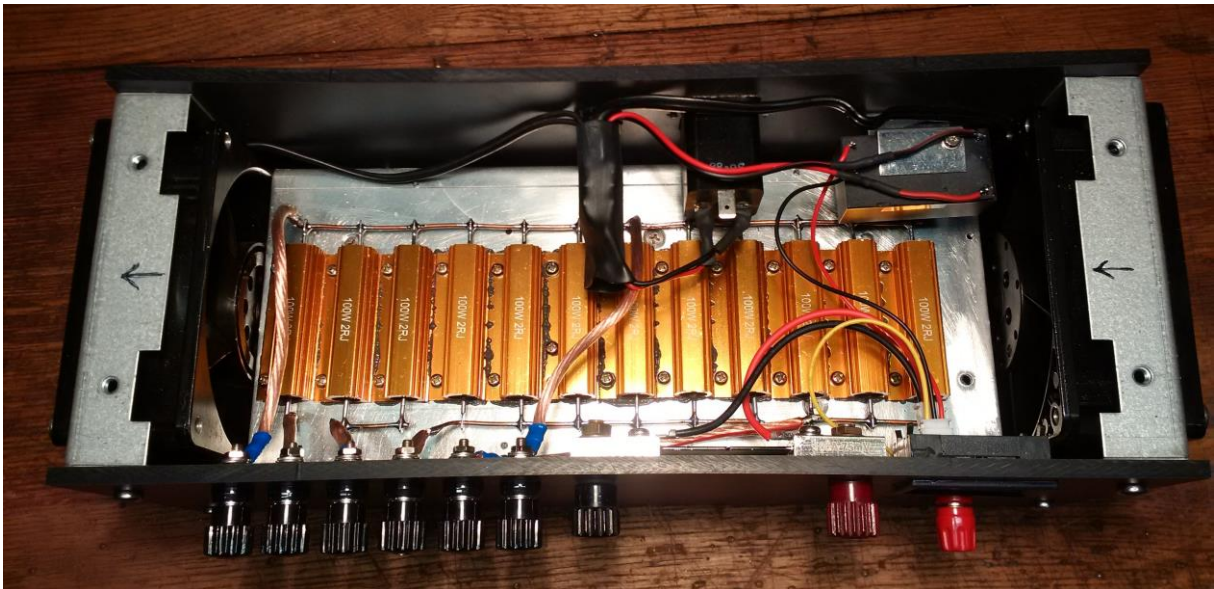
When a current is marked red the maximum power dissipation is exceeded and this condition must not be used.

I also added a LED meter which measures simultaneously the voltage and using a shunt also the current applied to the load.

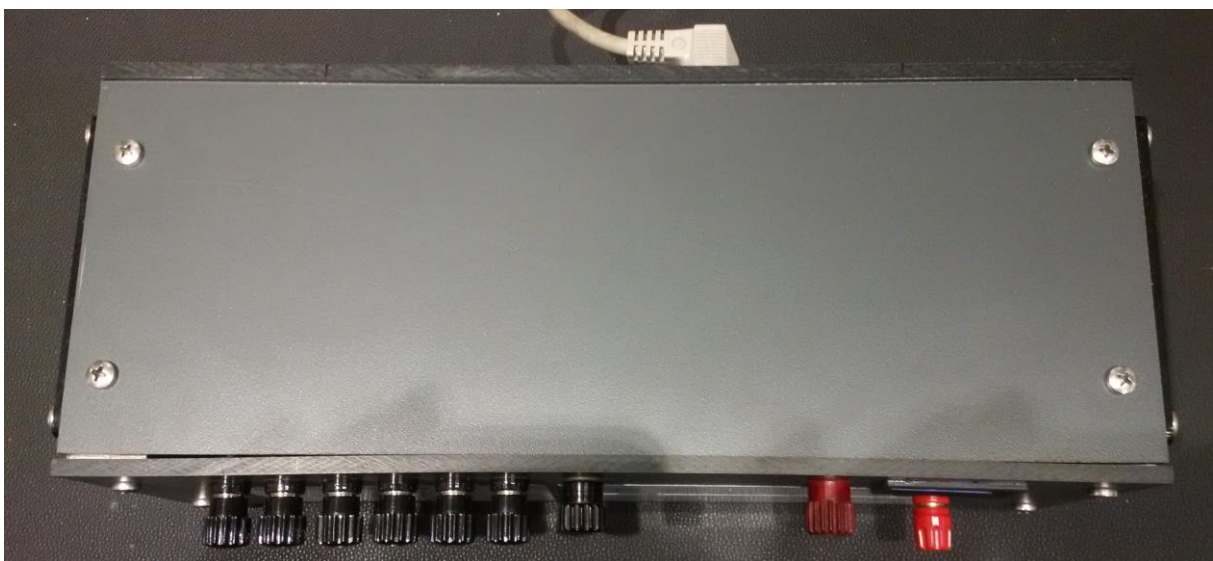
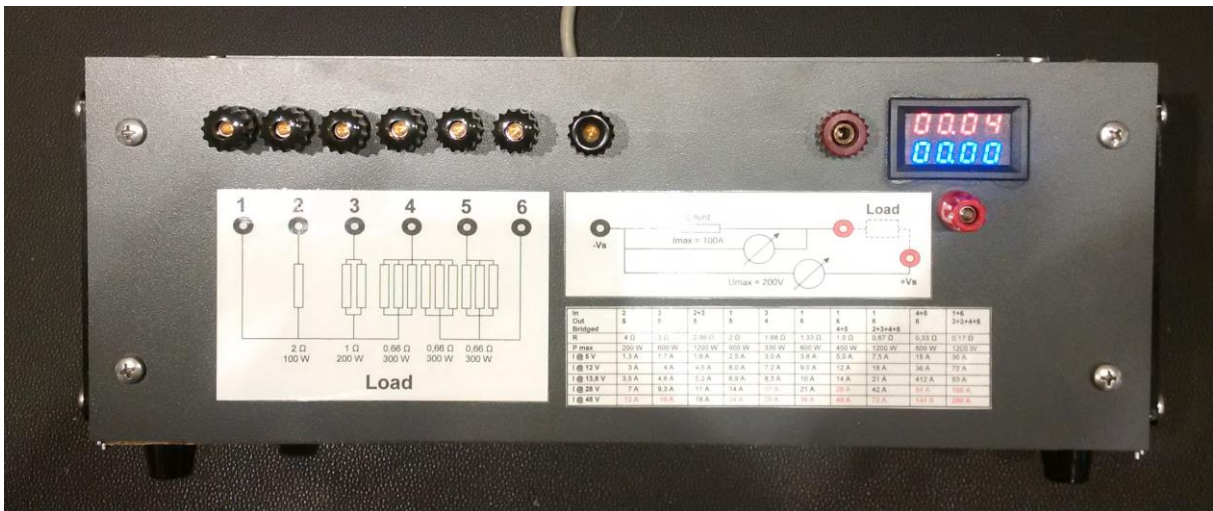


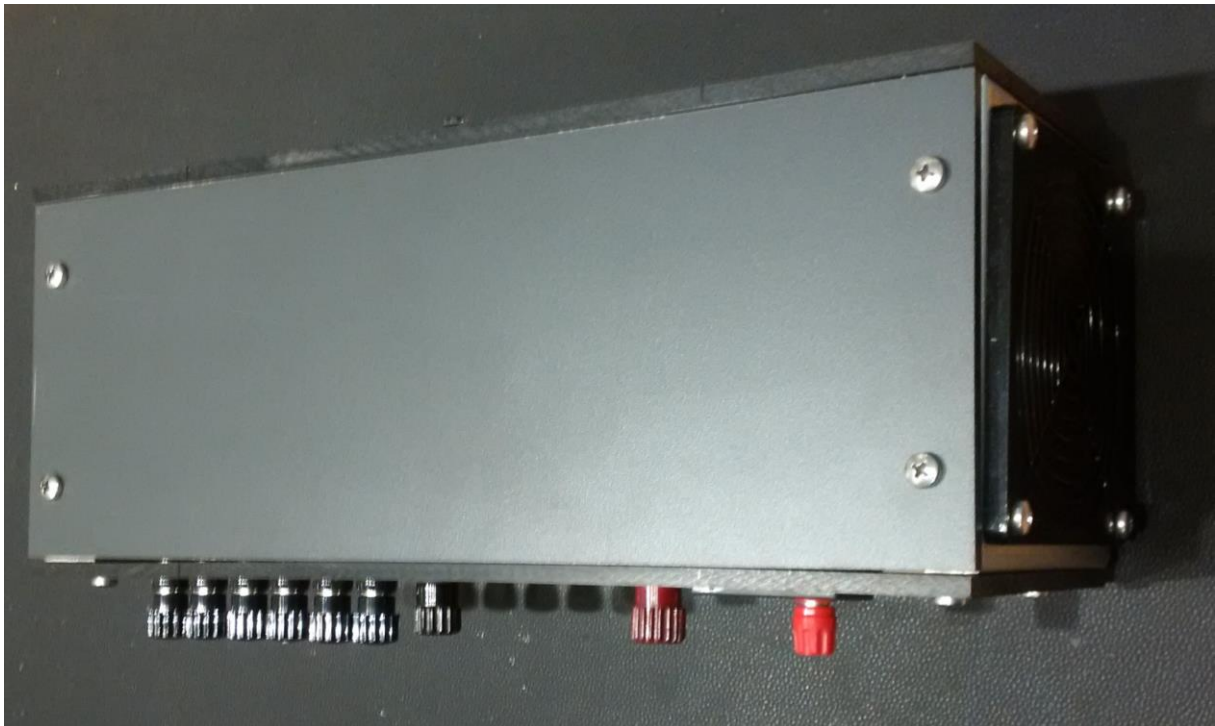
Here are some pictures of the resistive load during the construction phase:





Here are some pictures of the final version:





I am always grateful to get feedback and will be happy to answer questions.

Please send them to the Email address which you will find below.

Best regards

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