Reverse engineering on Jingling 30V-5A power supply

Vendeur européen : Formedia_SARL (eBay.de)

Egalement disponible directement en Chine sous la dénomination PS-305D ou YH-305D

Release 2.0

Overview

Début 2013 après réception postale d'une très prometteuse 1ère alimentation low-cost mais finalement, totalement HS, puis d'une seconde avec de sérieux problèmes de conception et surtout de solidité («auto-explosée» au transport), il a alors été décidé de :
- retourner la 1ère (en Allemagne, malheureusement à mes frais)
- garder la 2ème pour reverse engineering et en améliorer la conception

Le remboursement de la 1ère alimentation a été effectué depuis, mais avec beaucoup de difficultés
Mais les promesses écrites de renvoi d'une face avant correcte, en vue de réparation définitive n'ont jamais été tenues (potentiomètres doubles spécialement dédiés)

After receiving a first totally unworking Power supply, and then a second one also affected with serious irregularities, it was decided to :
- send back the 1st one
- keep the 2nd faulty one and check-on, by understanding what's really happening

- The 1st one was remboursed again with some difficulties
- A correct promised frond-end was asked many times but never sent until now

Abstract

1- First power supply – then sent back
2- Second power supply – and problems checking
3- Benchmarking
4- Conclusion – improvements to do

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1- 1st Power Supply received

1st Power supply

Absolutely no functionality :

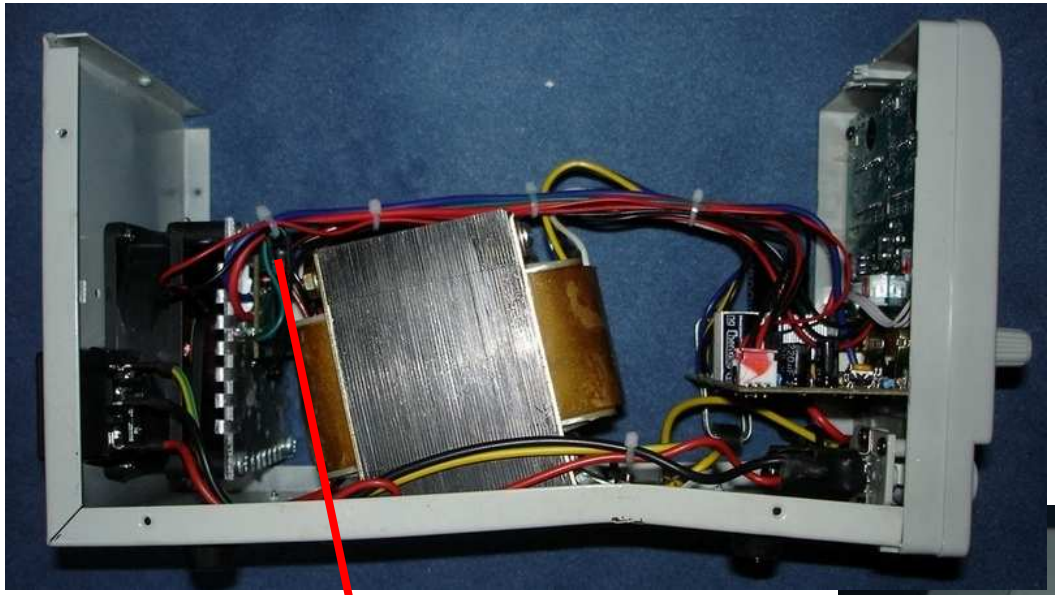
- Voltage mode : even with both Voltage Potentiometer coarse and fine in high position → only 0.00V indication ! !
- Current limitation mode (cable between + and -) → only 0.33A maxi + no red CC LED on !

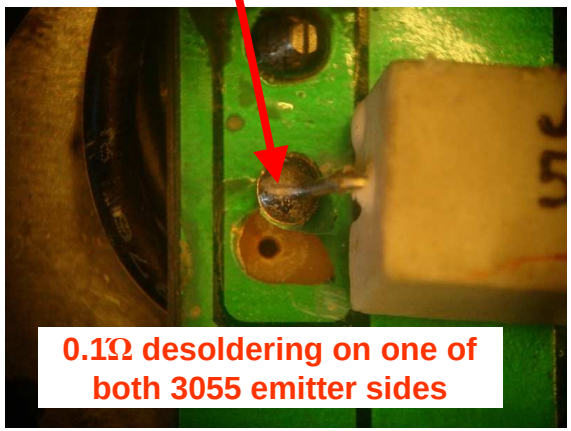
So, back-sending to seller was immediately decided via Colissimo (30€ given to the french Post-Office)

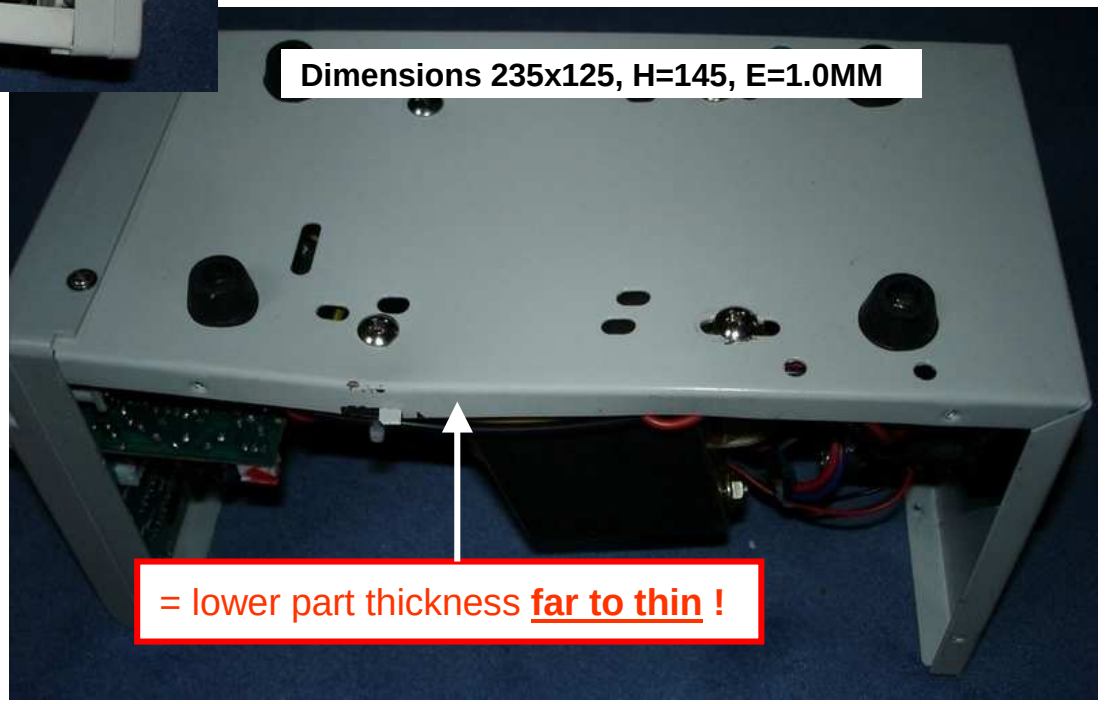
2- 2nd Power Supply received

Again new problems with it, but not the same as with the 1st one

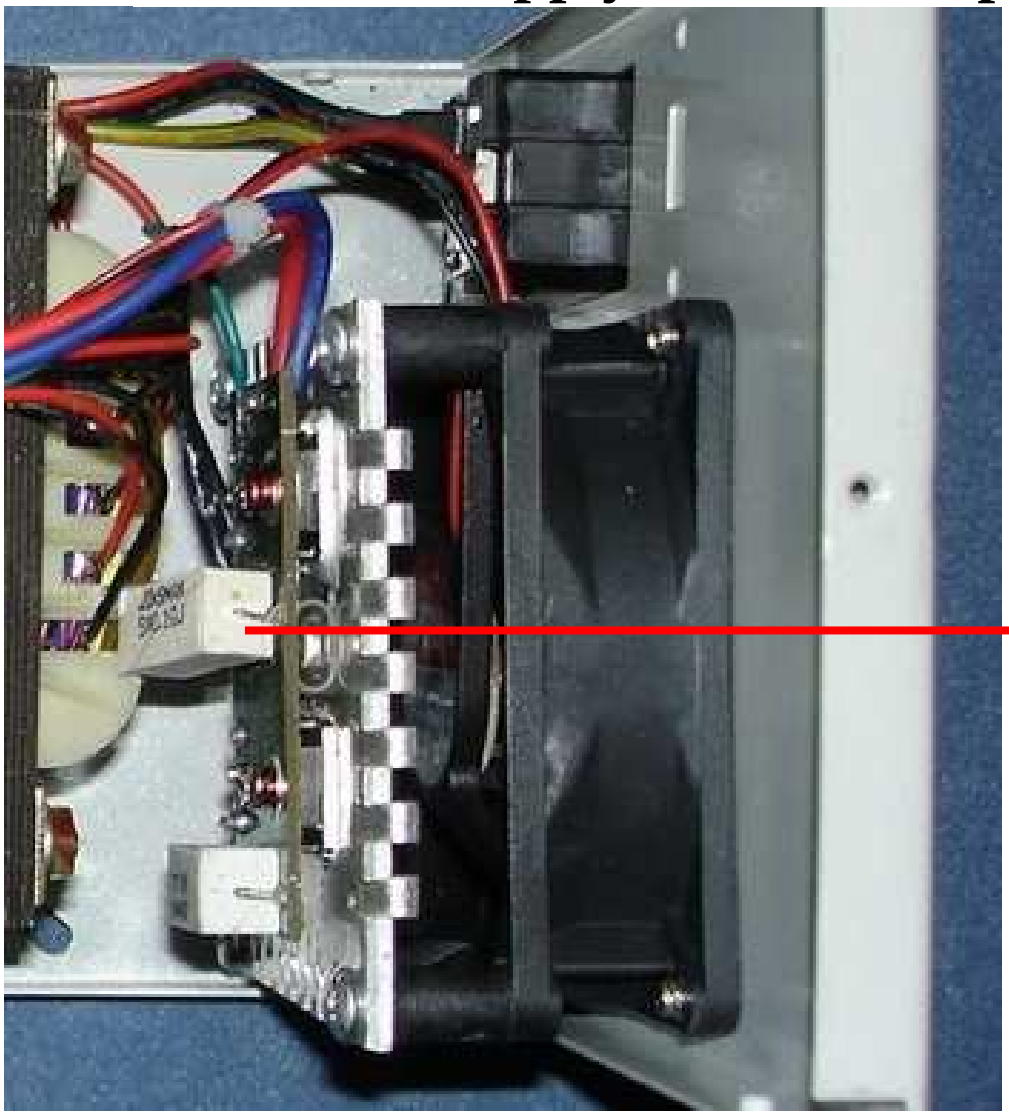
2nd Power supply : mecanical problems after receiving !

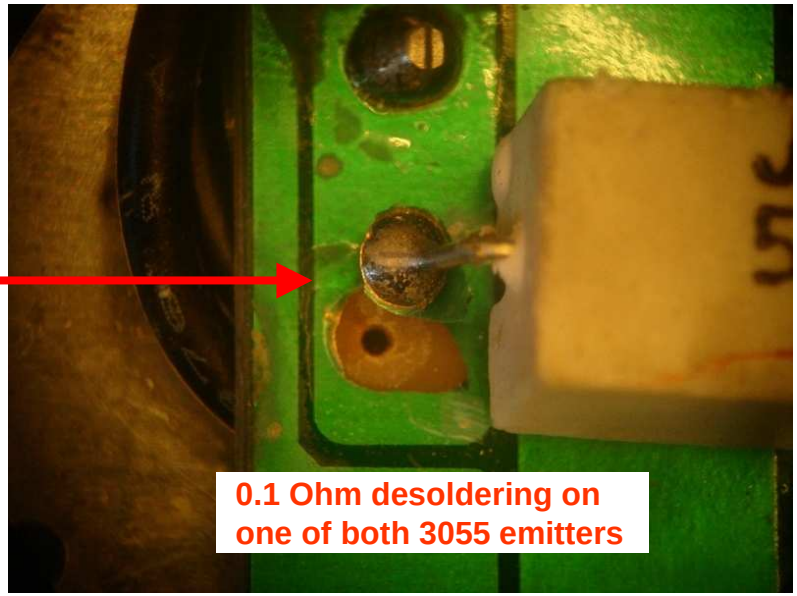




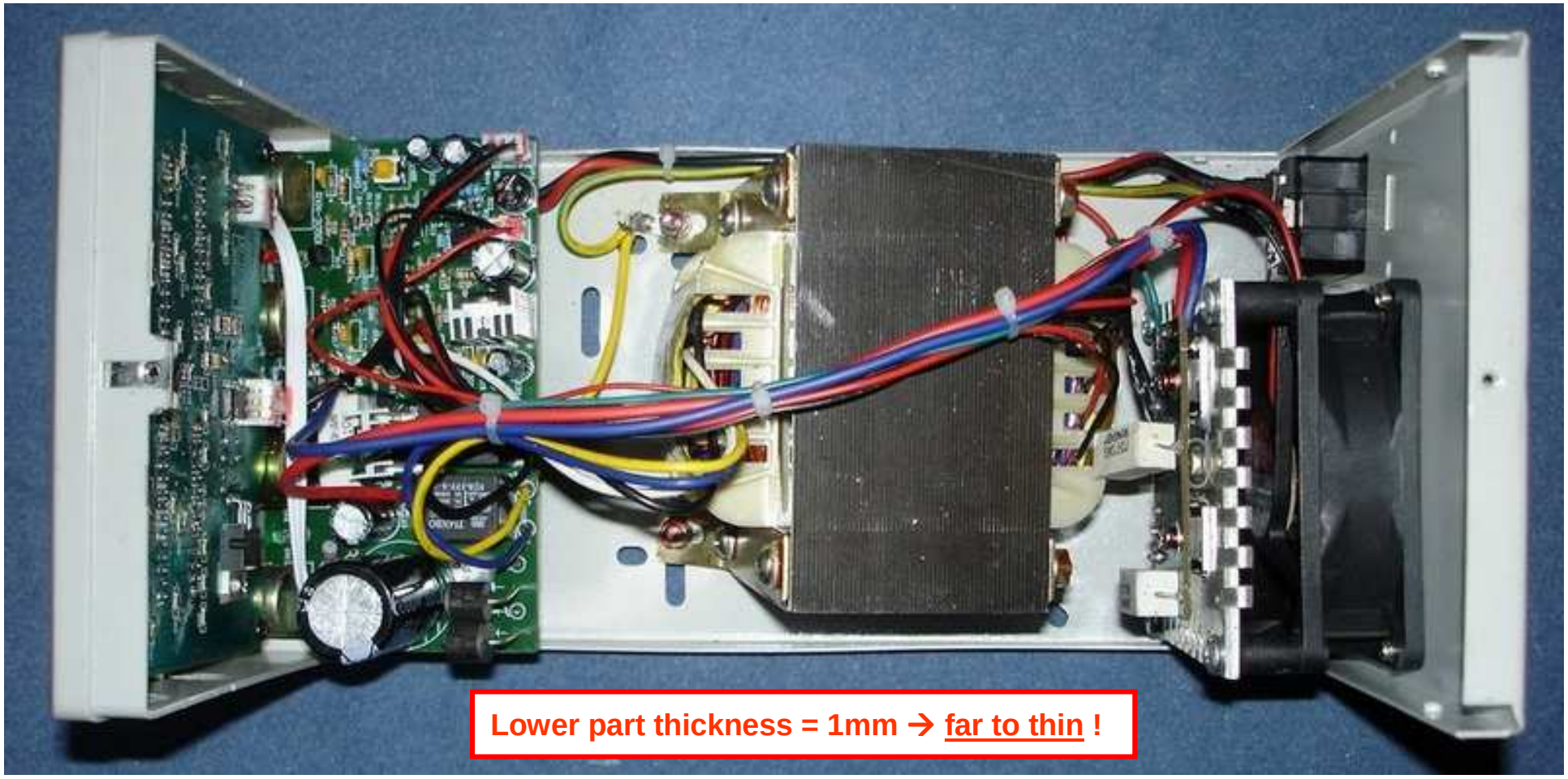


2nd Power supply : mecanical problems after receiving !





2nd Power supply after down side «reforming»



2nd Power supply : electrical problems

Again no correct functionality but affected with other symptoms :

- ***Voltage mode :***

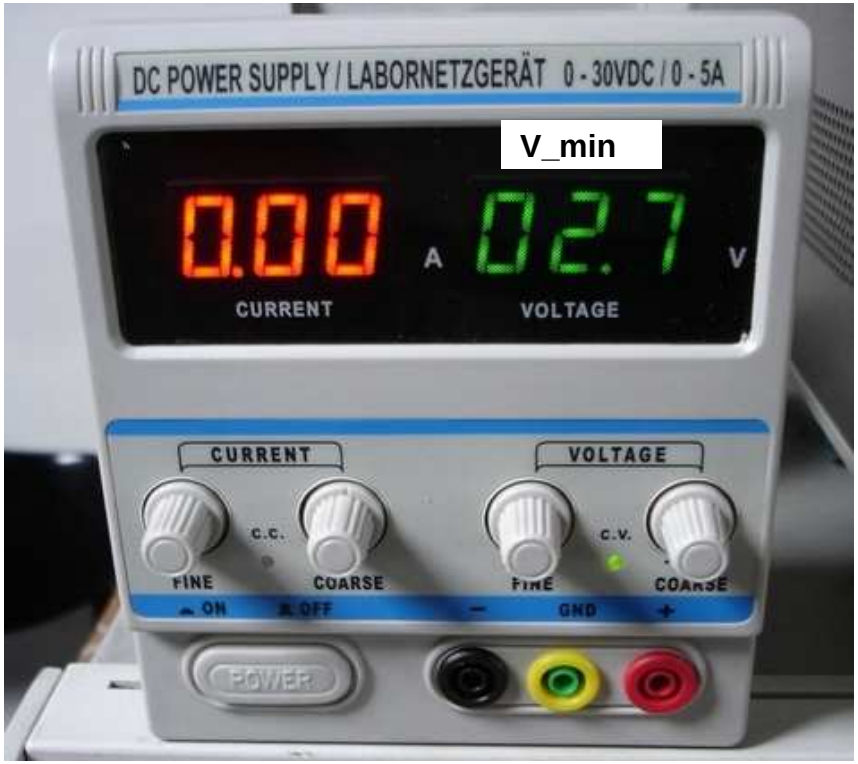
only from +2.7V up to +23.5V AND only with fine pot in UP position (fully clockwise)
when decreasing the fine poti a little, the Voltage decreases immediately to 0V

- ***Current mode :***

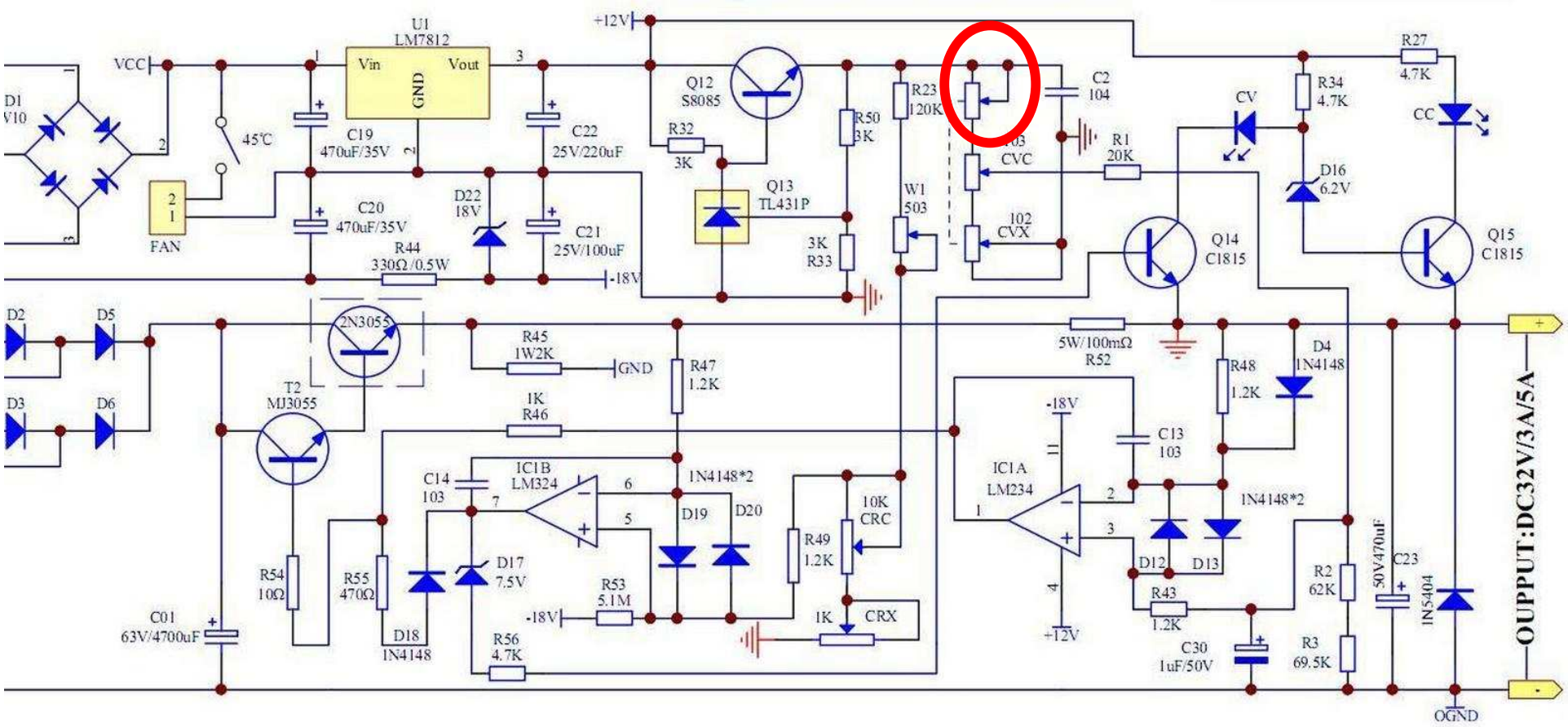
Fine potentiometer OK
Coarse potentiometer goes continually up from 0 to 5.2A, but restricted to only 4/5th rotation
then directly down to 4.5A
then again continually up to 5.2A for 5/5th rotation

And also its exact contrary when put down

2nd Power supply : electrical problems



Voltage regulation



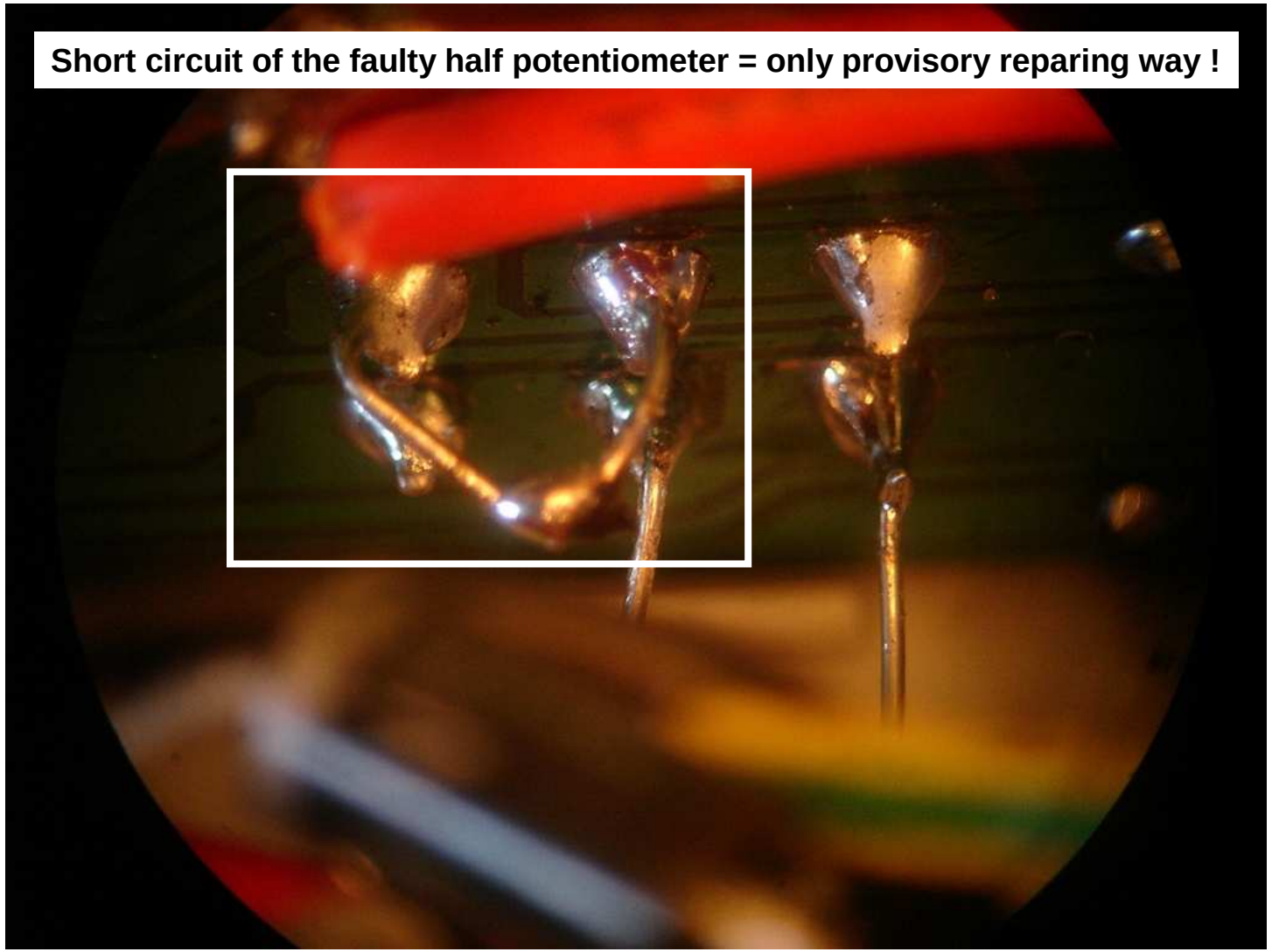
Measuring with an Ommeter did give following results :

-CVC Voltage potentiometer : half part to LM7812 output in **open circuit**

a short-circuit on it gives now full +2.7V to +31.1V

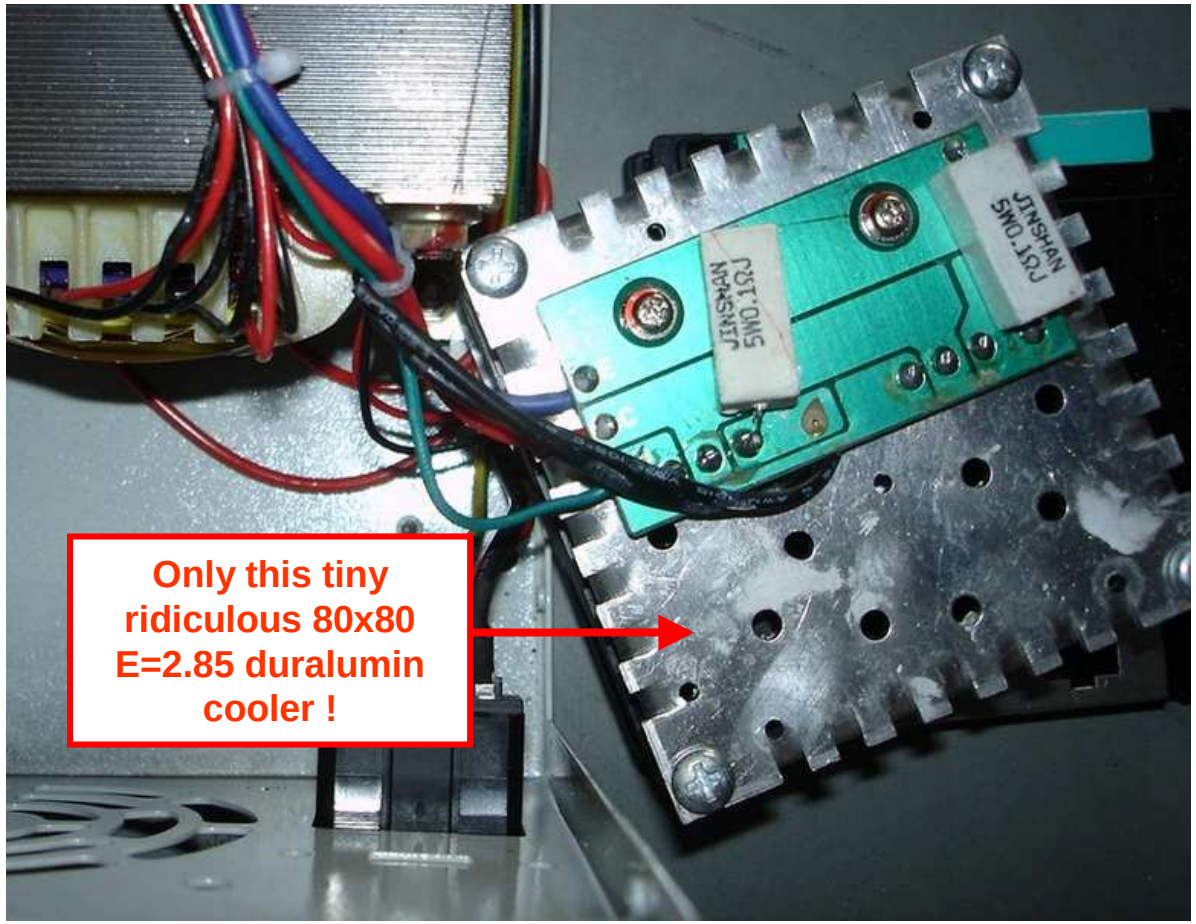
but the fine Voltage potentiometer is only active in the lowest Voltage part (2.8V to 0V). Its Delta V adjustment becomes less (or no) active at Voltage highest part

Voltage regulation

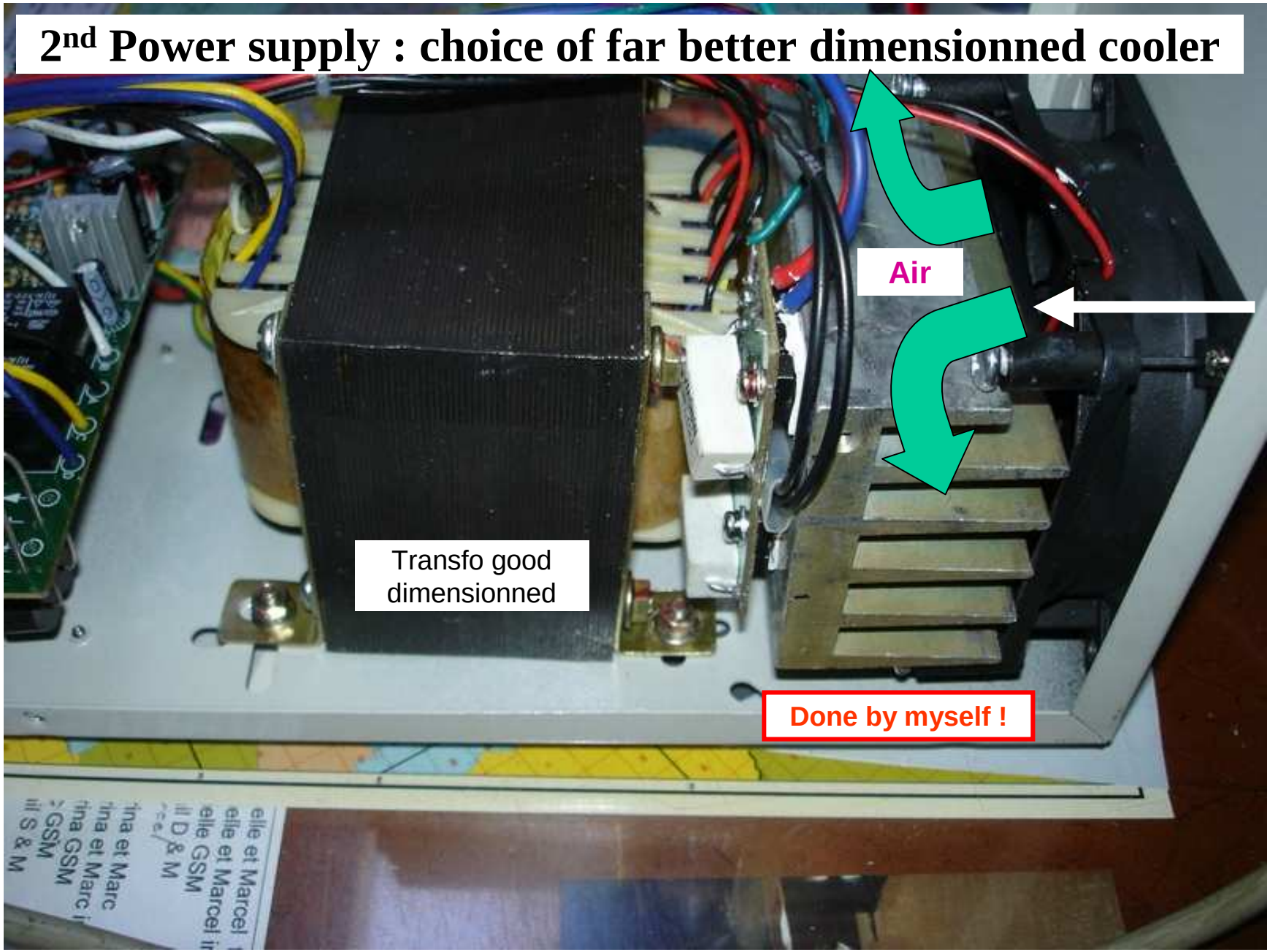


2nd Power supply : heat problems

Even with continuous litte currents <=1A, the electrical fan is running almost all the time and very loud → **heater totally underdimensionned**

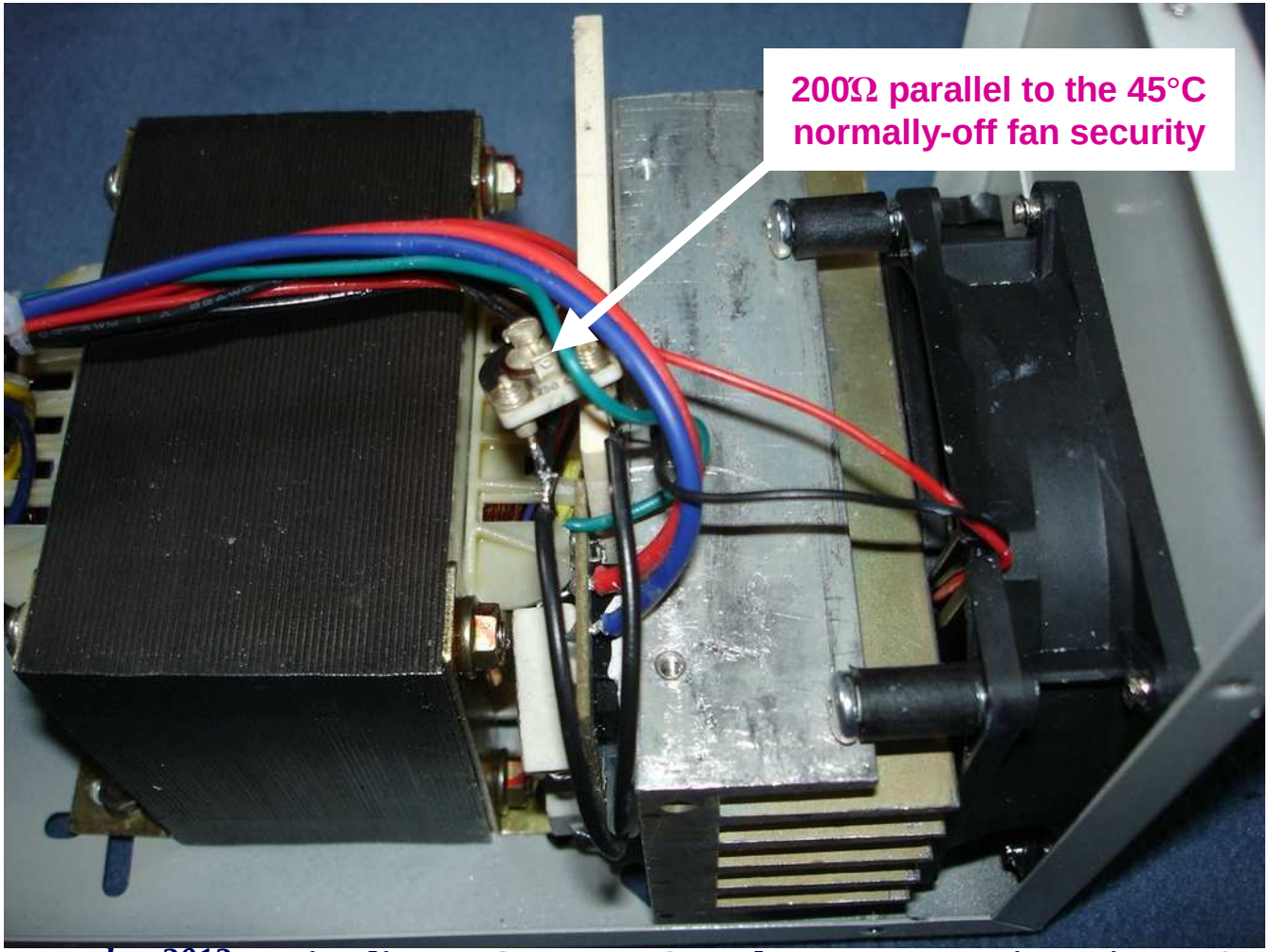


2nd Power supply : choice of far better dimensionned cooler

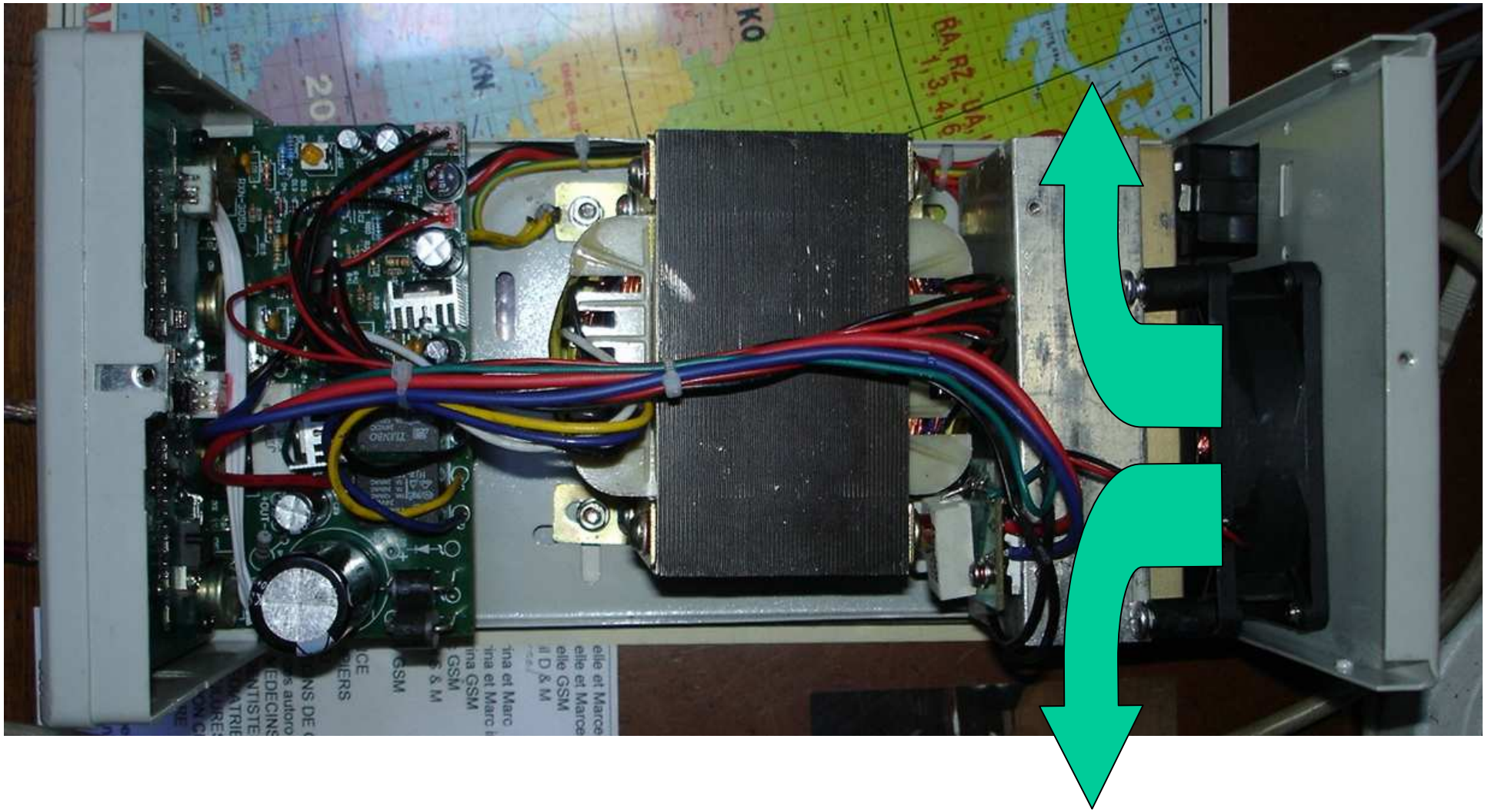


2nd Power supply : choice of new cooler

Works OK with open case, but with shut box, cooler too often « on »
So it was decided to cool at 100% the time but at vy low speed : a 200 to 250Ω'd solve the problem



2nd Power supply and new «cooling stream»



2nd Power supply and «cooling stream»

Initial cooling near front-side

Modified cooling near back-side + greater hole near radiator output

3- Benchmarking

Benchmarking

Directly by ShenZhen.GuangDong, China

60€ et 93€ ! !

Selon vendeur chinois !

Ou YH-305D
Ressemble étrangement à celle de Formedia_SARL !

by Quality-Gasgets UK

Both holes lines all along its whole cover length (better for the transformator)

4- Conclusion – improvements to do

Conclusion

RAPID following improvements have to be done :

1- Lower part ***box thickness >1.5 or 2mm*** (avoids « transformator break-through » during postage) → very very important do to ASAP
2- Instead of steel, choicing Duralumin >2 or 2.5mm
3- Added screws in the middle bottom part of the box
4- Far ***better potentiometer quality*** asked (absolutely checked previously before soldering)
5- ***Replacing*** of the initial ridiculous ***radiator*** by a far greater one
6- ***Cooling à 100% time*** but at low speed → high speed only if T>= 45°C
7- ***Two hole lines in box cover*** on whole full length
8- ***Previously electrical check*** before postage
9- Better protection package for postal sendings

It is the only way to :
- Get this Power supply à 5Amp at full time
- Have future faith in this production

NB : when Voltage has to be continuously adjusted from 0 to 30V → **ATTENTION !**
At steps of +7V +15.6V and +23V, two internal relays are switching the AC transfo secondary outputs during a short time for best Yield compromise

Even with a construction done in east-asiatic countries, a far more serious conception has to be formerly done !

Same Powerpoint sent to lux/DL seller more than 6 months ago !

Conclusion

Améliorations suivantes à effectuer le plus rapidement possible :

1- Coffret en tôle : épaisseur à augmenter à 1.5 ou 2mm (actuellement seulement de 1mm) → évitera son implosion lors de maltraitances postales → **à effectuer ASAP**

2- Plutôt que de la tôle, prendre du dural épaisseur >= 2 or 2.5mm

3- Rajouter des vis de fixation sur la partie centrale du coffret

4- Choisir des potentiomètres doubles de ***bien meilleure qualité*** et surtout, les ***tester initialement avant montage***

5- Remplacer le ***radiateur d'origine*** (à l'origine, petit carré ridicule et dangereux) par un ***radiateur parfaitement dimensionné***

6- Assure un refroidissement à ***à 100% du temps,*** mais à ***vitesse réduite***→ vitesse maximale seulement si la température dépasse 45°C

7- Petits trous de refroidissement d'origine : en faire au moins deux lignes oblongues sur toute la longueur

8- Essai électrique à effectuer AVANT envoi (minimum à espérer) !

9- Meilleure protection cartonnée initiale avant envoi, évitant l'implosion probable lors des manutentions postales

Même pour une construction sous-traitée en Asie, il est fort regrettable que son étude initiale ne fut pas été effectuée avec nettement plus de sérieux !

Copie reçue par son représentant luxembourgeois depuis plus de 6 mois