

Open-Frame Linear Power-Supply Assembly Instruction

This document outlines the assembly instruction for a set of linear supplies to power up an MCE (multi-channel-electronics). Refer to the following supplementary documents:

- Block diagram (ELE_C585-500)
- Bill of Materials for Linear Open Frame PSU Version 2 (002388)
- Cable Wiring Diagram (ELE-C585-501-RevA)
- Bill of Materials for the Cable (002484)

Revision History

<i>Revision</i>	<i>Date</i>	<i>Author</i>	<i>Description</i>
2.0	2012-02-14	Pavel T.	Initial release
3.0	2012-02-15	MA	cosmetic changes to comply with other MCE docs
4.1	2012-02-17	TF	Assigned document number, added component details
4.2	2012-02-17	MA	Added a note for optional vah, and added list of relevant docs
5.0	2013-05-29	MA	Pavel updated section 3 with the transformer change and added figure 3.2 in February.

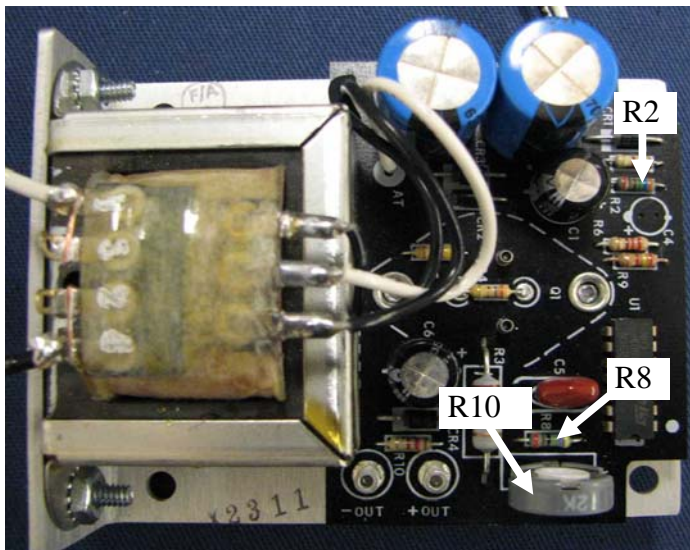
1. Modifying “+Vah” Supply

Power supply: IHA15-0.5 by International Power (Fig. 1).

MCE# 002375

Spec before modification: 12V, 0.5A.

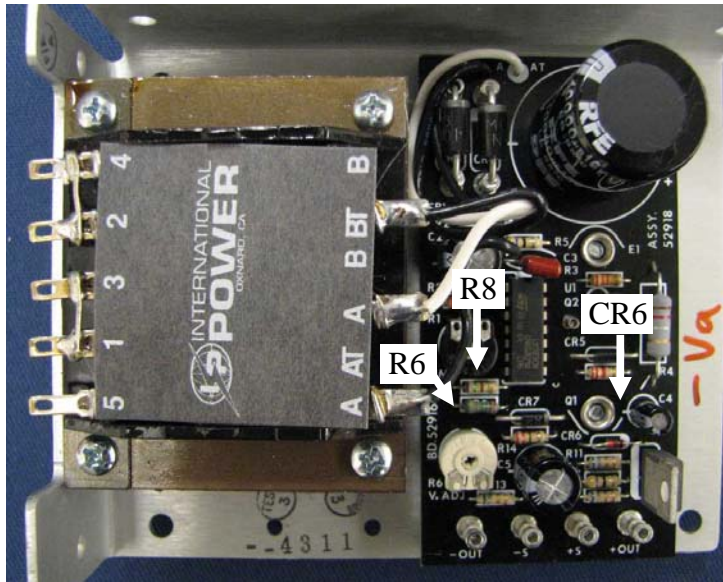
Target spec: 10V, 0.1A.



- 1) Replace **R2** with 3.65k
MCE# 002491
- 2) Replace **R8** with 470 Ohm
MCE# 000918
- 3) Trim output to 10V with **R10**
- 4) Test the PSU by running it with ~ 0.1A load (>1W, 100 Ohm resistor) and verifying the output voltage.

Fig. 1.

- **Note:** This supply is only needed if an older generation of MCE cards are used, i.e., RC Rev B and earlier, BC Rev. D and earlier. Skip to section 2 if this is not applicable to your setup.



2. Modifying “-Va” Supply

Power supply: IHB5-3/OVP by International Power (Fig. 2).

MCE# 002374

Spec before modification: 5V, 3A.

Target spec: -6.2V, 2A.

- 1) Replace **R8** with 8.25k
MCE# 002492
- 2) Replace **CR6** with 6.8V Zener
1N5235
MCE# 002493
- 3) Trim output to 6.35V¹ with **R6**
- 4) Test the PSU by running it with ~ 2 A load (>15W, 3.1 Ohm resistor) and

verifying the output voltage.

Fig. 2.

¹ ~0.15V added to compensate for DC losses in 2m cable @ 3A

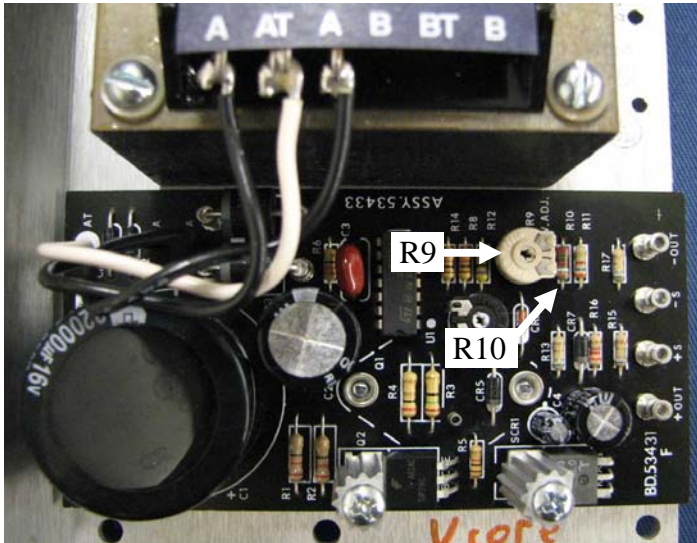
3. Modifying “+Vcore” Supply

Power supply: IHC5-6/OVP by International Power (Fig. 3.1, 3.2).

MCE# 002373

Spec before modification: 5V, 6A.

Target spec: 3V, 5A.



- 1) Replace transformer with VPP10-5600 (Fig. 3.2)
- 2) Replace **R10** with 3.92k MCE# 002494
- 3) Trim output to 3.19V² with **R9**
- 4) Test the PSU by running it with ~ 5A load (>15W, 0.6 Ohm resistor) and verifying the output voltage.

Fig. 3.1

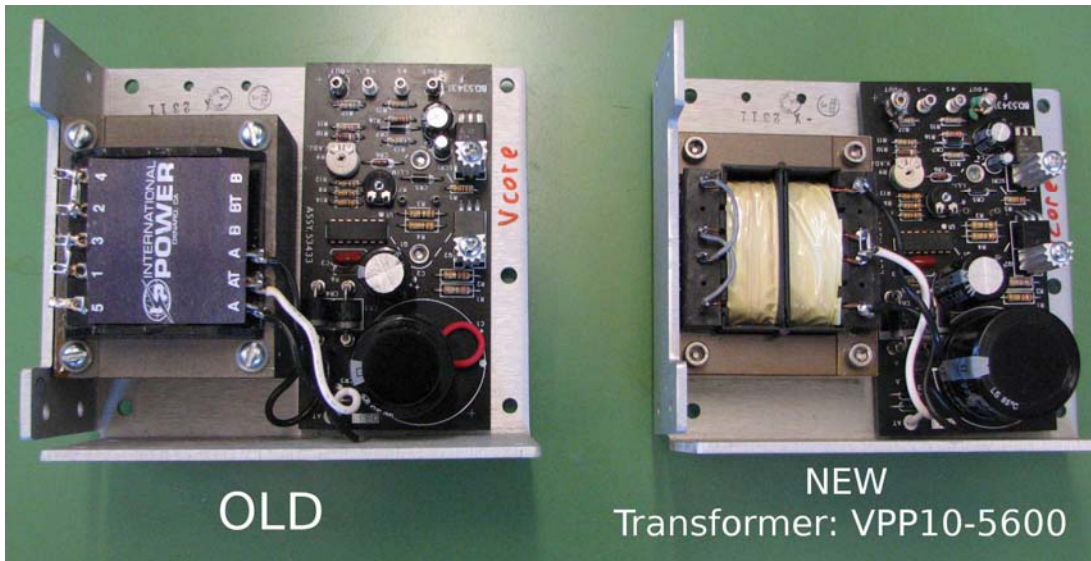


Fig. 3.2

² ~ 0.19V is added to compensate for DC losses in 2m cable @ 5A

4. Modifying “+Vlvd” Supply

Power supply: IHB5-3/OVP by International Power (Fig. 4).

MCE# 002347

Spec before modification: 5V, 3A.

Target spec: 4.5V, 3A.

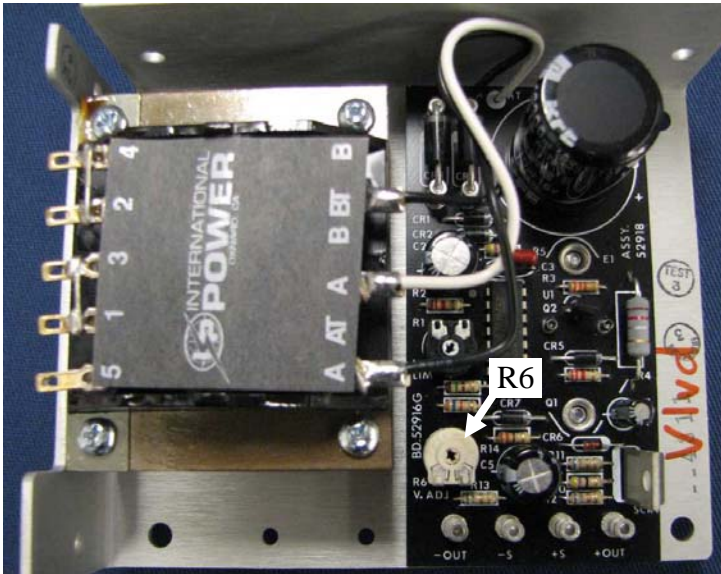


Fig. 4.

- 1) Trim output to $4.6V^3$ with **R6**
- 2) Test the PSU by running it with $\sim 3A$ load (15W, 1.5 Ohm resistor) and verifying the output voltage.

³ $\sim 0.1V$ is added to compensate for DC losses in 2m cable @ 3A

5. Modifying “+Va” Supply

Power supply: IHE5-18/OVP by International Power (Fig. 5).

MCE# 002376

Spec before modification: 5V, 18A.

Target spec: 6.2V, 15A.

- 1) Replace **R13** with 8k25, MCE# 002492
- 2) Replace **R12** with 130 Ohm, MCE# 002495
- 3) Remove **CR5**
- 4) Replace **C2** and **C3** with 100mF x 16V capacitors, MCE# 002462
- 5) Trim output voltage to 6.7V⁴ with **R11**
- 6) Trim output current limit to max value with **R8** (clockwise)
- 7) Test the PSU by running it with ~ 15A load (~100W, 0.41 Ohm resistor) and verifying the output voltage.

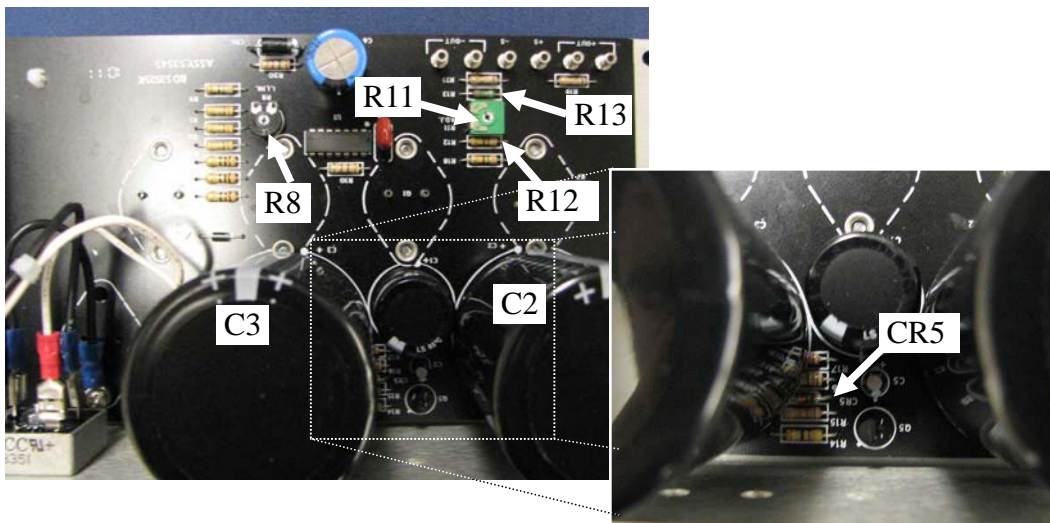


Fig. 5.

⁴ ~ 0.5V added to compensate for DC losses in a 2m cable @ 15A load

6. Testing the Power-Supply assembly with an MCE

Depending on current load and cable length some DC voltage drop should be expected at MCE power rails. Those losses need to be compensated for by adjusting output voltages of individual supplies. This is especially true for high-current loads on “+Va” and “Vcore” lines.

The results obtained while testing these set of supplies connected to a 5-MDM MCE Subrack with a 2-meter cable are presented in Table 1. MCE was populated with following cards:

- SCC-044 (Rev. B, Iss. 6 Clock Card)
- SRC-088 (Rev. B, Iss. 8 Readout Card)
- SRC-098 (Rev. B, Iss. 8 Readout Card)
- SRC-010 (Readout Card)
- SRC-028 (Rev. B Readout Card)
- SBC-013 (Rev. B, Iss. 11 Bias Card)
- SBC-024 (Bias Card)
- SBC-072 (Rev. D, Iss. 9 Bias Card)
- SAC-026 (Rev. C, Iss. 3 Address Card)

Table 1. DC losses in 2-meter cable			
	Open-circuit voltage (V), measured at the Power Supply	Loaded Voltage (V), measured at Subrack	
		On turn-on	After ~ 1 hour of operation
Vcore	3.195	3.030	3.027
Vlvd	4.60	4.55	4.55
+Va	6.80	6.32	6.31
-Va	-6.40	-6.28	-6.28
+Vah	10.03	10.01	10.02

Should the DC losses be considerably different from the values above, the connection cable and/or current load needs to be checked.