LVPS ELMB_MB v.6.5 modifications for version 6.5.2.

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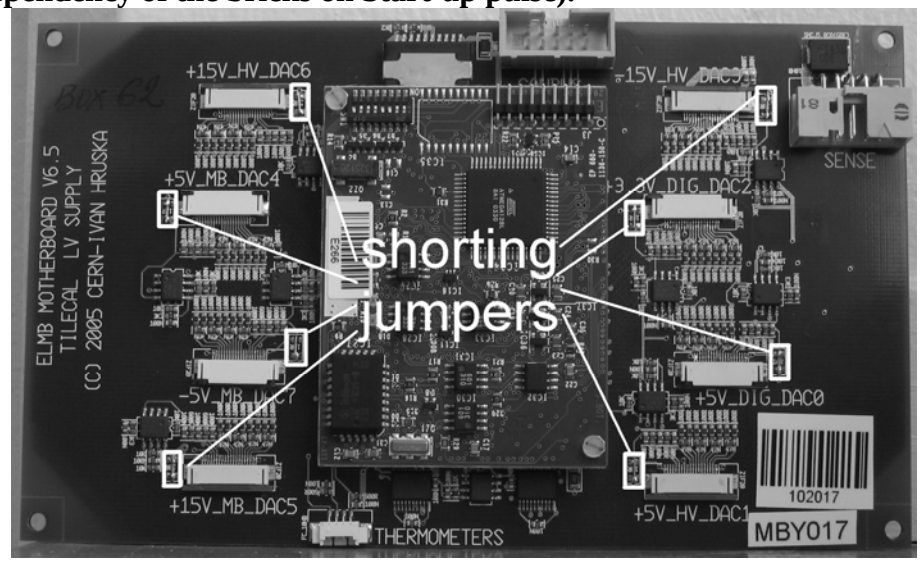
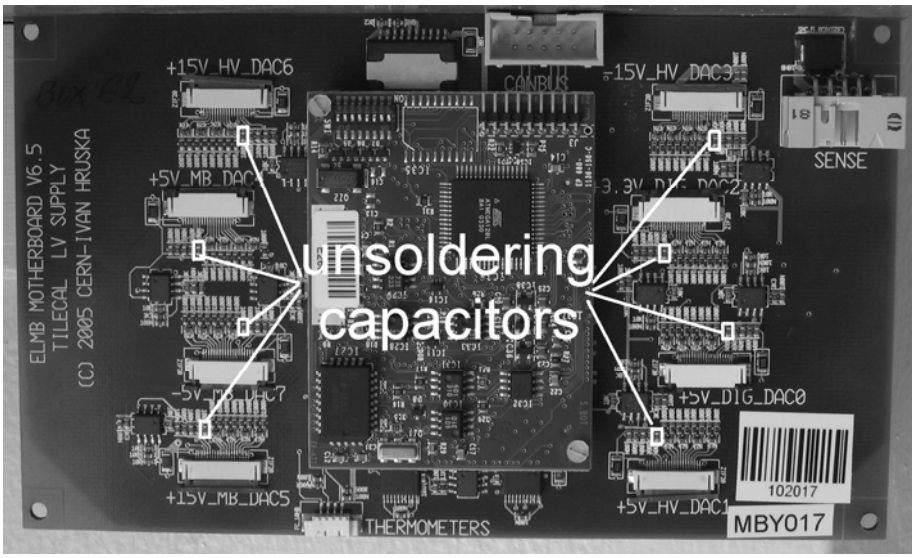
Summary: **This document describes the component changes on LVPS ELMB_MB from produced version 6.5 into new version 6.5.2. All mentioned component names and values are referring to the scheme components designed by Ivan Hruska of ELMB_MB version 6.5.**
In addition to previously discussed ELMB_MB version 6.5.1, new modifications were added in the section describing the improvements of 5 TileCal Drawer sense lines measurements +3VDIG, +5VDIG, -5VMB, +5VMB, +15VMB (Part 3 of this document).

1. **Shortcutting ground resistors R 129 – 136. Put zero ohm resistors (to remove Vout dependency of the bricks on Start-up pulse).**



Pic1: Top side photo of ELMB_MBv6.5. Remove 8x 10ohm resistors and short them or put zero ohm resistors.

2. **Removing C119, C99, C109, C129, C89, C61, C45, C79. Due to unconnected one temperature measurements of each brick the corresponding floating capacitors are removed.**



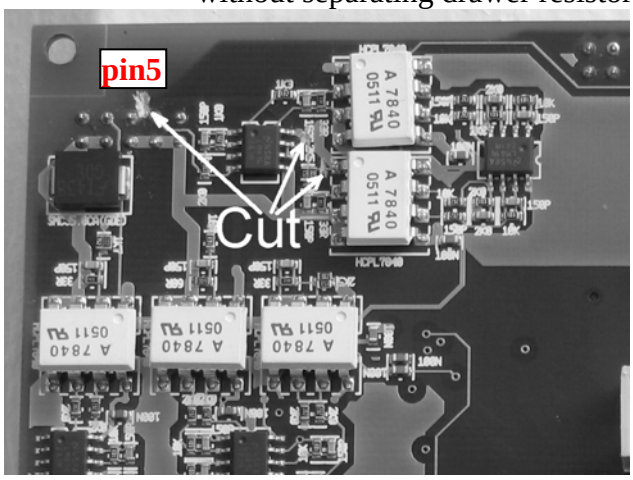
Pic2: top side photo of ELMB_MBv6.5. Remove 8x 100nF capacitors.

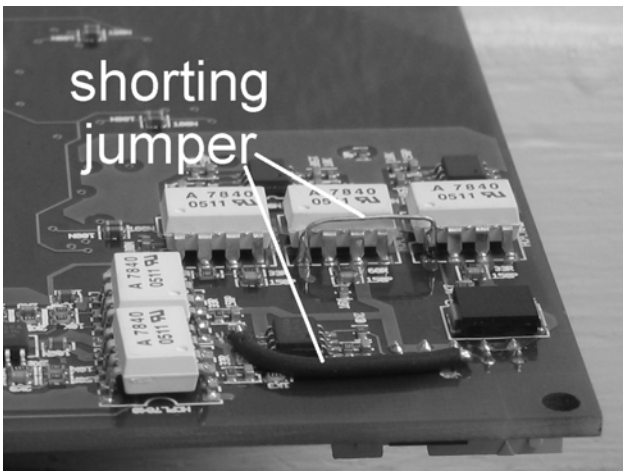
3. Improvements of 5 Drawer sense lines measurements +3VDIG, +5VDIG, -5VMB, +5VMB, +15VMB (see also ELMB_MB scheme on page 3, Pic5):

(a) Cutting +5VMB pcb trace from pin 5 on connector J12 and resistor R27 (from MB bottom side, see Pic3).

(b) Then R27 (part of +5VMB sense line divider) connect directly to pin 5 of J12 connector by a 30mm piece of wire (Pic4).

(c) Then the Vdd of the U7, U10, U12 connect to the +5V DIG (pin 2, J12) in order to supply primary part of isolation amplifiers (HCP7840) to +5V DIG sense line without separating drawer resistors.





Pic3 and 4: Bottom side photos of ELMB_MBv6.5. Cutting traces and powering optocouplers from 5VDIG level.

(d) Unsolder opamp U13, resistor R39, R40, and capacitor C23 (no more needed to invert -5VMB sense lines, HCPL7840 can measure negative voltages.

(e) Reconnect the resistor divider R37, R38 from positive to negative input (pin3) of U12 (HCPL7840).

(f) Connect the R37 resistor directly to pin 7 of the connector J12 (-5VMB sense lines).

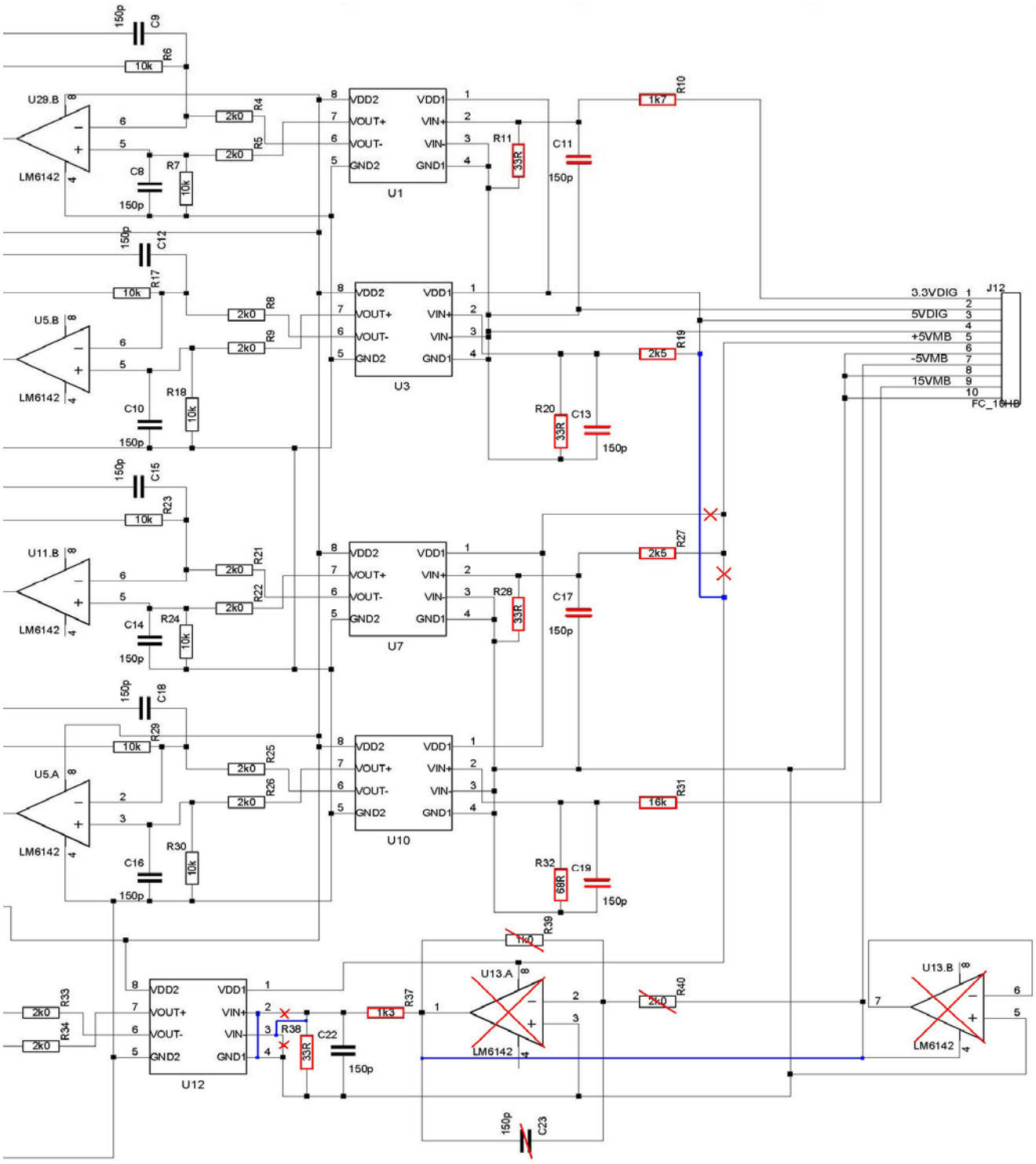
(g) Nominal resistor values of ELMB_MB input sense line dividers were changed (see scheme on page 3).

R11, R20, R28, R32, R38 = 200 ohm
R10 = 10k,
R19 = 16k,
R27 = 15k,
R31 = 47k,
R37 = 15k

These modifications were applied to reduce the influence of 1kOhm (1%) separating resistors (inside Drawer) on the ELMB_MB sense lines measurements.

(h) Solder ceramic capacitor 10uF to pins 2-3 of U1, U3, U7, U10, U12, to increase the nominal filtering capacitor values of C11, C13, C17, C19, C22.

(i) Solder the Tantalum stabilization capacitor 68uF instead of Transil device D5.



Pic.5: Part of the MB_ELMB V6.5 schematic documentation, from page no.7. Changes of sense line optocouplers powering do +5VDIG line, changing of resistor dividers for all sense lines. All changes are drawn in red color.