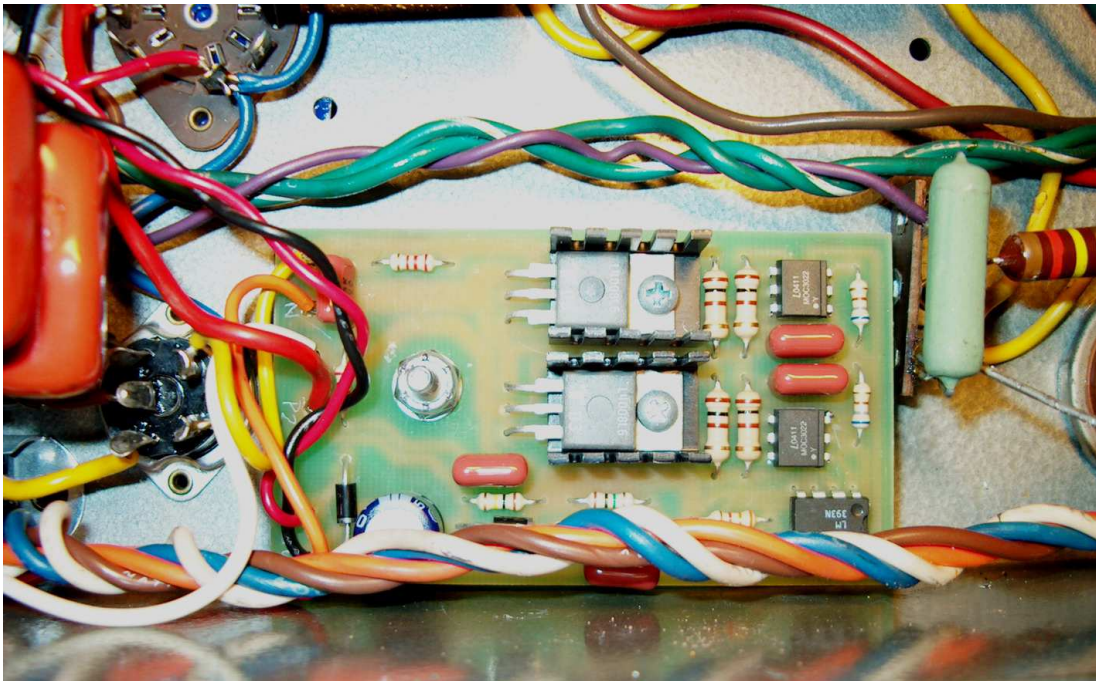


Hammond® B3/C3 & Leslie

Motor Speed control

by Dan.Vigin



Hammond® and Leslie® are registered trademarks of Suzuki Musical Instrument Manufacturing Co. Ltd.

Binche / Belgium

Oct. 2013

B3/C3 Motor Speed Control

Oct.2013
dan.vigin

Hammond B3/C3 & Leslie – Motor Speed control

Purpose of this project.

The idea behind this project is to take benefit of the various DC voltages that are now available from the newly installed PSU of AO-28 B3/C3 preamp equipped with a toroidal transformer. Refer to 'Hum & Noise reduction' chapter for details.

Motor Speed Control PCB.

Personally, I dislike the original speed control system provided with Leslie kits.

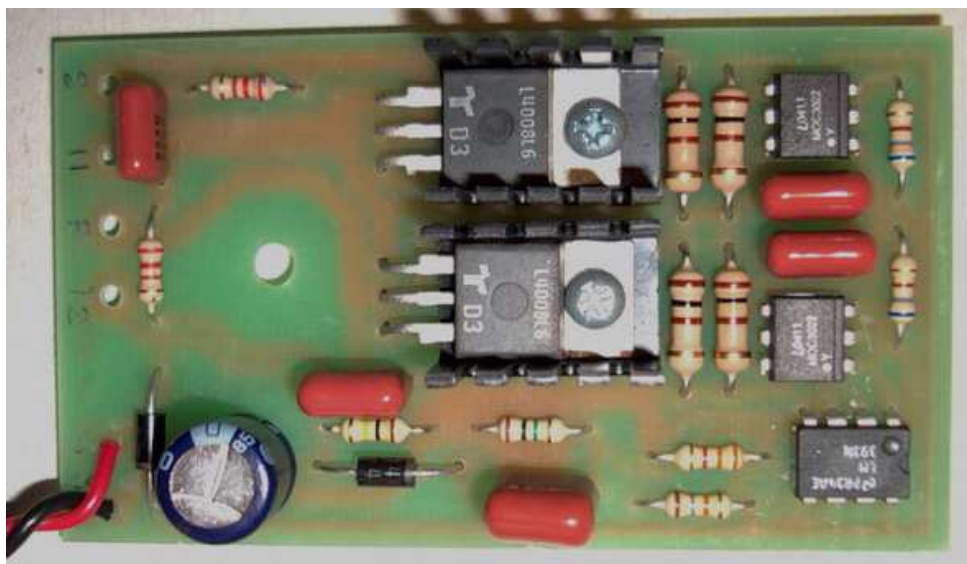
There are several ways to control the motor speeds of Leslie cabinets:

- either the +300Vdc is coming from Leslie PSU itself (Pin #5) and via a basic network of resistors, the relay can be activated.
- or another Leslie kit is collecting the B+ voltage from the AO-28 through one 7-pin adaptor on the 6X4 rectifier tube to activate or not the relay.

In both cases, it creates problems on a long term basis.

- If the 10K Ω /7W resistor in the Leslie amp becomes opened, speed of motors will go to 'Fast' at once and you have no other alternative than to remove the motor plugs from the Leslie chassis.
- with the 7-pin adaptor on 6X4 socket, you can expect poor contacts and other troubles.

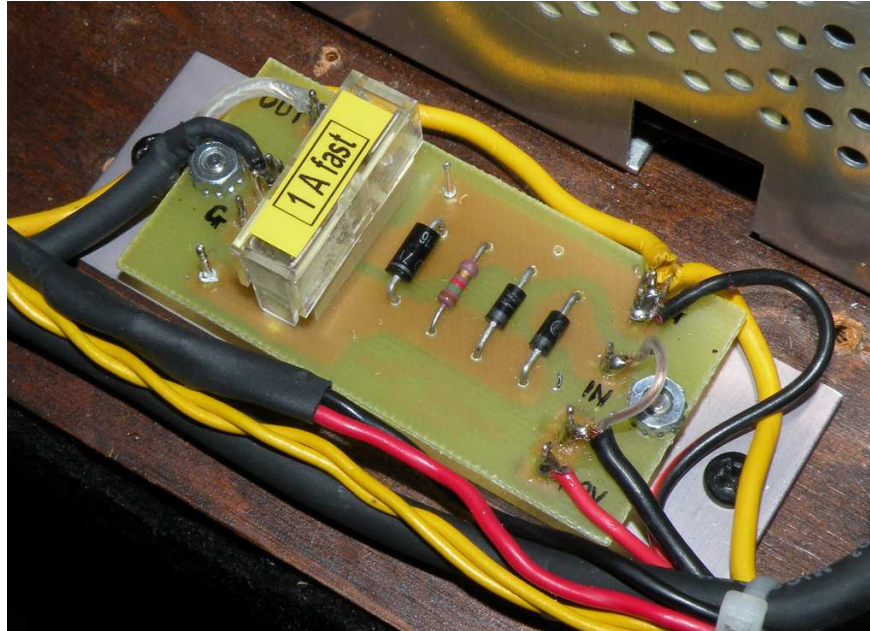
In my case, only Hamptone SSR-122B solid state relays are used and installed in my Leslie's. SSR-122B PCB's only require either 0 Vdc (Fast) or + 9Vdc (Slow) to change the speed of the motors.



Hamptone SSR-122B board. (see website : www.bborgan.com).

Also, no more audible 'clanky noise' of relay when speed of motor is changed.

Since +9Vdc is now available with this newly installed PSU board, the initial Leslie kits have been abandoned. Inevitably, some precautions have to be taken and a small PCB has been designed with a few components (see schematic diagram) to assure safe liaison between the organ and the Leslie cabinet.



Protection PCB (installed in B3/C3)

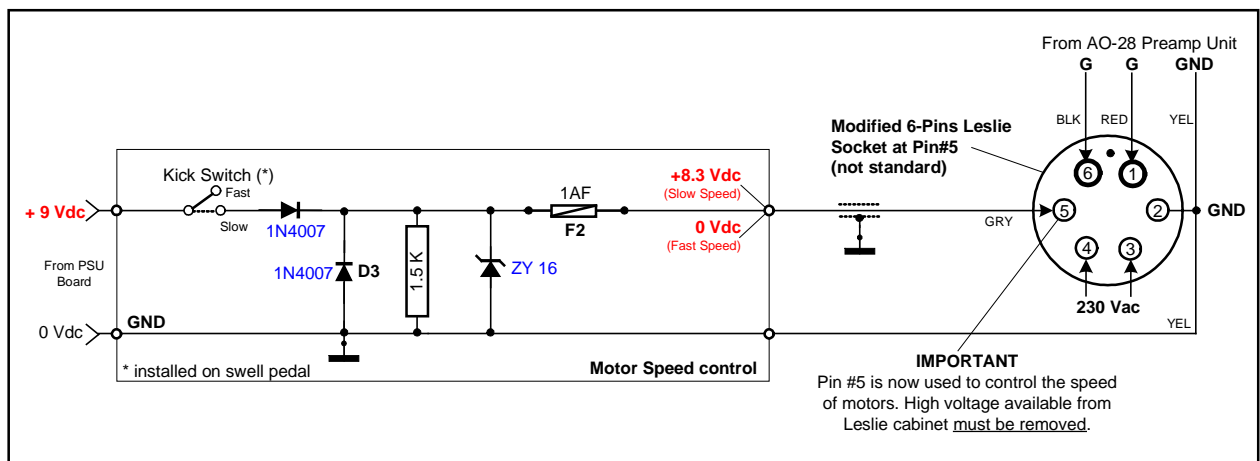
There are some advantages in doing so:

- the Leslie isolation transformer is no more needed
- no more audible 'Pop' noise when switching from Slow to Fast or reversely.
- no more bad contacts
- more reliable setup

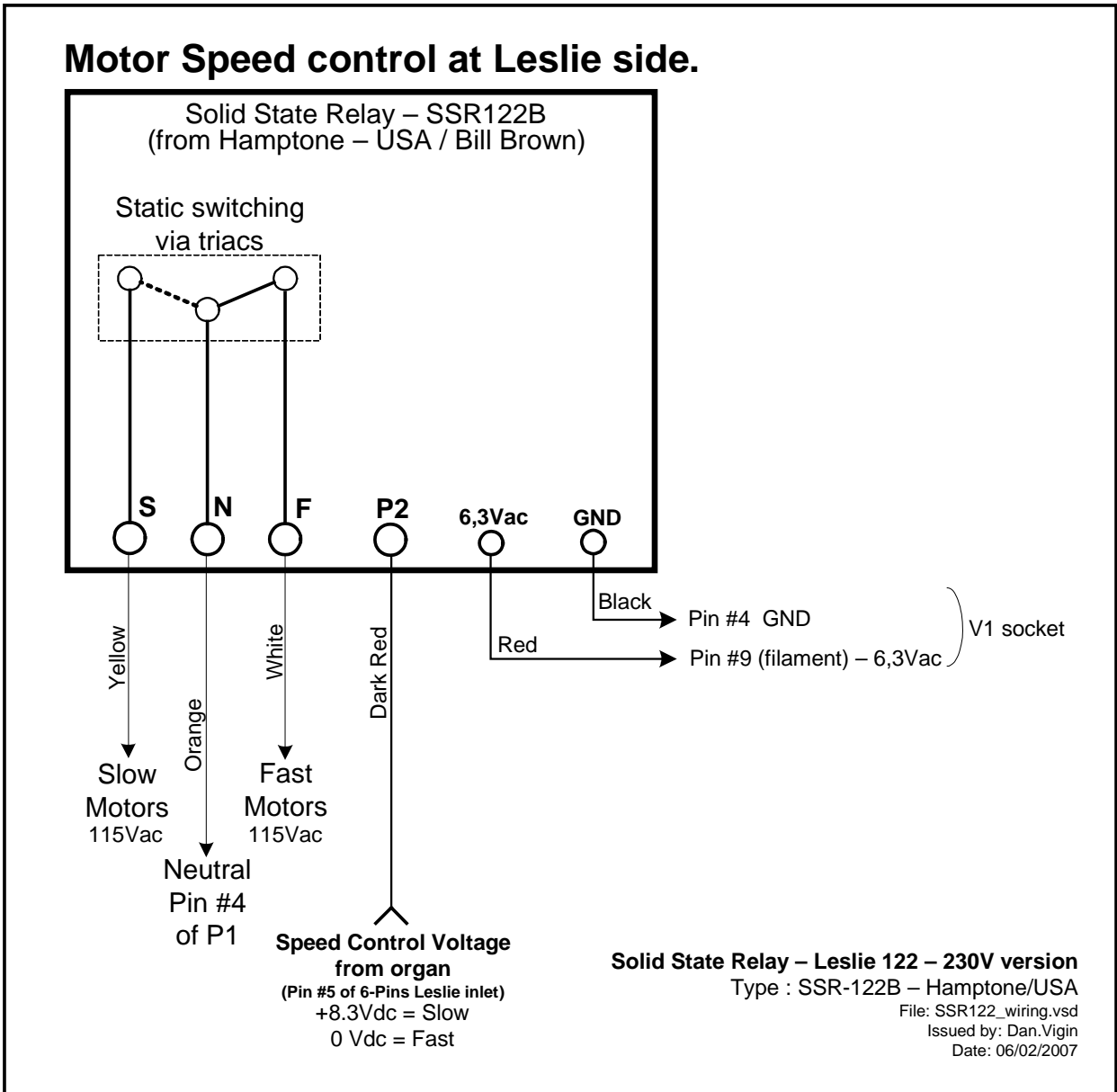
However, such connecting setup (B3/C3 –Leslie) is no more standardized.

This means that the organ must be connected with its companion Leslie cabinets and not with any other one. Important !

Nevertheless, it has to be mentioned that the original wiring at Leslie side can be restored quite easily in a few minutes whenever needed.



Wiring diagram inside the B3/C3 organ.



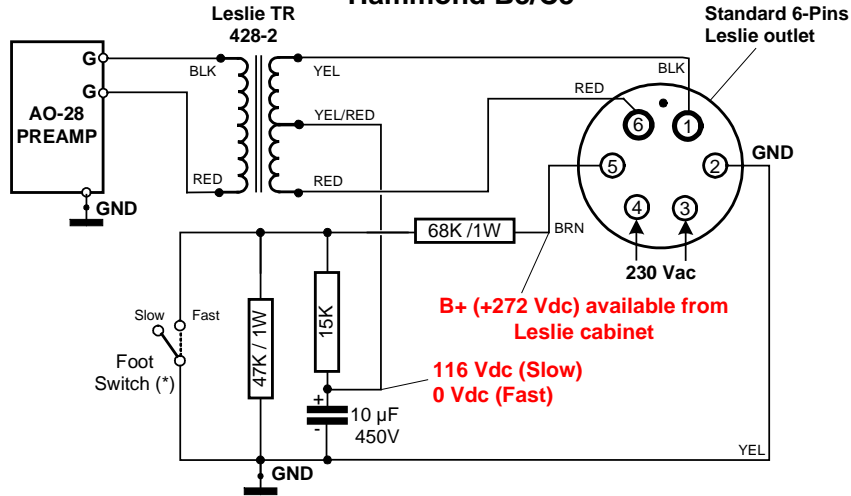
Wiring diagram inside the Leslie cabinet.

The installation of SSR-122B inside the Leslie chassis is quite simple. The relay REL.I has to be unwired and removed. The tube V1 (12AU7A) has to be removed and is no more used. The remaining wiring is self-explanatory, see above wiring diagram.

The switching of speed is provided by a basic toggle switch installed on the left hand side of the swell pedal. Shielded cable is used up to the Motor Speed control board.

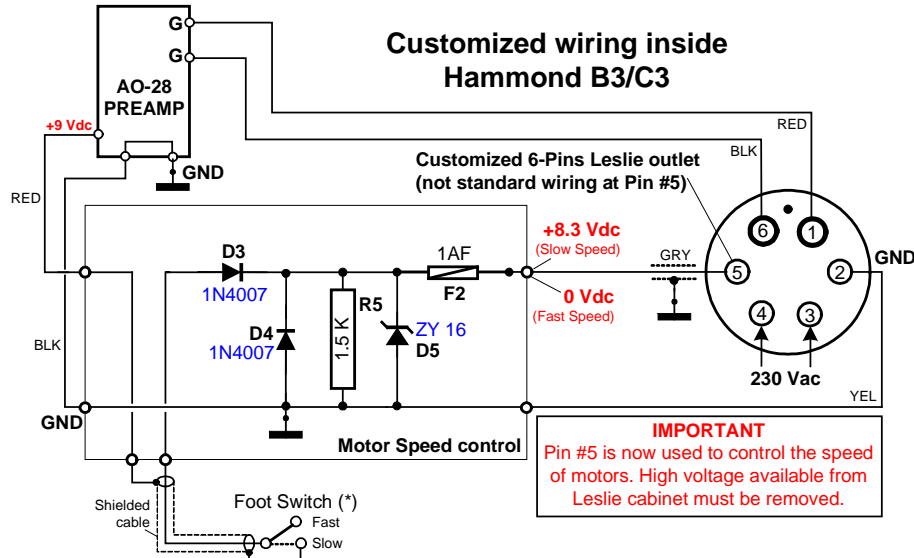
As a reminder, a 'Customization Diagram' of both B3/C3 and Leslie schematics is shown on the next page.

Original wiring inside Hammond B3/C3



B+ (+272 Vdc) available from Leslie cabinet
116 Vdc (Slow)
0 Vdc (Fast)

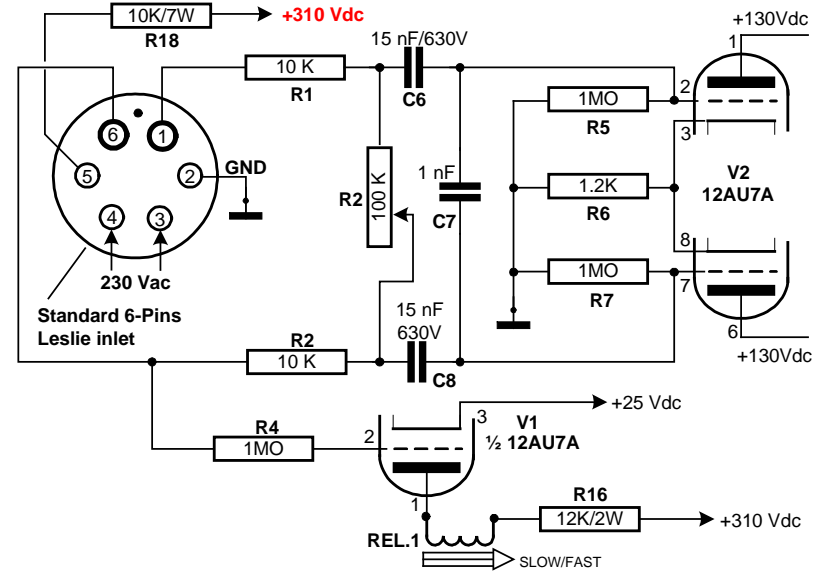
Customized wiring inside Hammond B3/C3



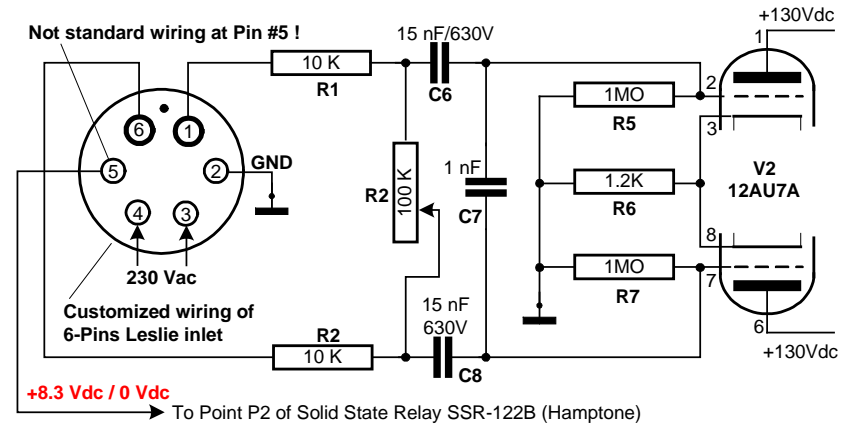
IMPORTANT
Pin #5 is now used to control the speed of motors. High voltage available from Leslie cabinet must be removed.

* installed on swell pedal

Original wiring inside Leslie 122



Customized wiring inside Leslie 122



+8.3 Vdc / 0 Vdc
To Point P2 of Solid State Relay SSR-122B (Hamptone)

Customization Hammond B3/C3 with Leslie 122

Conclusions.

The Solid State Relay SSR-122B from Hamptone is highly recommended, provides excellent results and is very reliable. Installation is rather simple.

Trust having been of some interest,

Dan.Vigin