

After 9 months work, I have finally finished the overhead. The biggest influence on how I tackled everything was achieving effective backlighting. I trialed a number of ways:-

- The simplest was to use low energy dimmable mains bulbs. However, I had already decided to mount all I/O boards within the overhead frame to make it self contained and easily removable. I then found that the many components ie switches, gauges, I/O Boards etc blocked the light getting to the front panels.
- The use of 12volt MES bulbs was also tried but suffered from the above problem
- Alan Watson, a friend, suggested the use of 12 volt led strips link

<http://www.rapidonline.com/Electronic-Components/Optoelectronics/LED-Strips/Flexible-LED-strips-30-way/81568>

and showed me some impressive photos of what he had done. This option had potential, but the leds needed to be at an optimal distance from the backpanel to get uniform lighting and therefore needed to be fixed to something

After much thought, beers and failed experiments, I finally found the answer – treat all the I/O wiring and backlighting as different layers.

Layer one has all the switch wiring put tight to the backpanel, avoiding cutouts for backlighting, also solid core wiring was used to make certain the wires stayed in place.

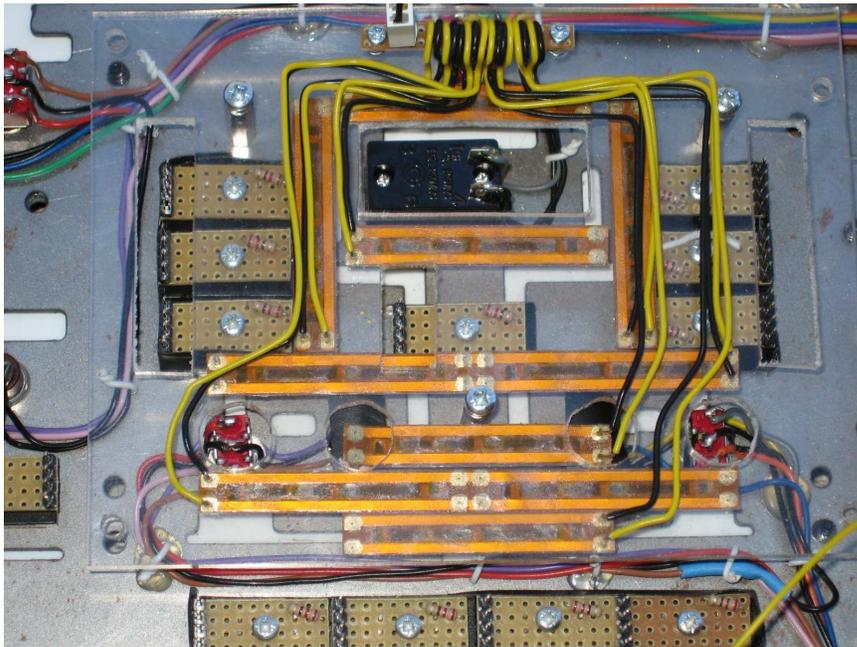
Layer two was the backlighting, which was achieved by making up Perspex panels to carry the strip leds and fixed using stand off pillars from the back panel.

Layer three was the wiring to the annunciators, which was formed into a loom. Returning to correct mistakes/omissions has proven very easy with this design

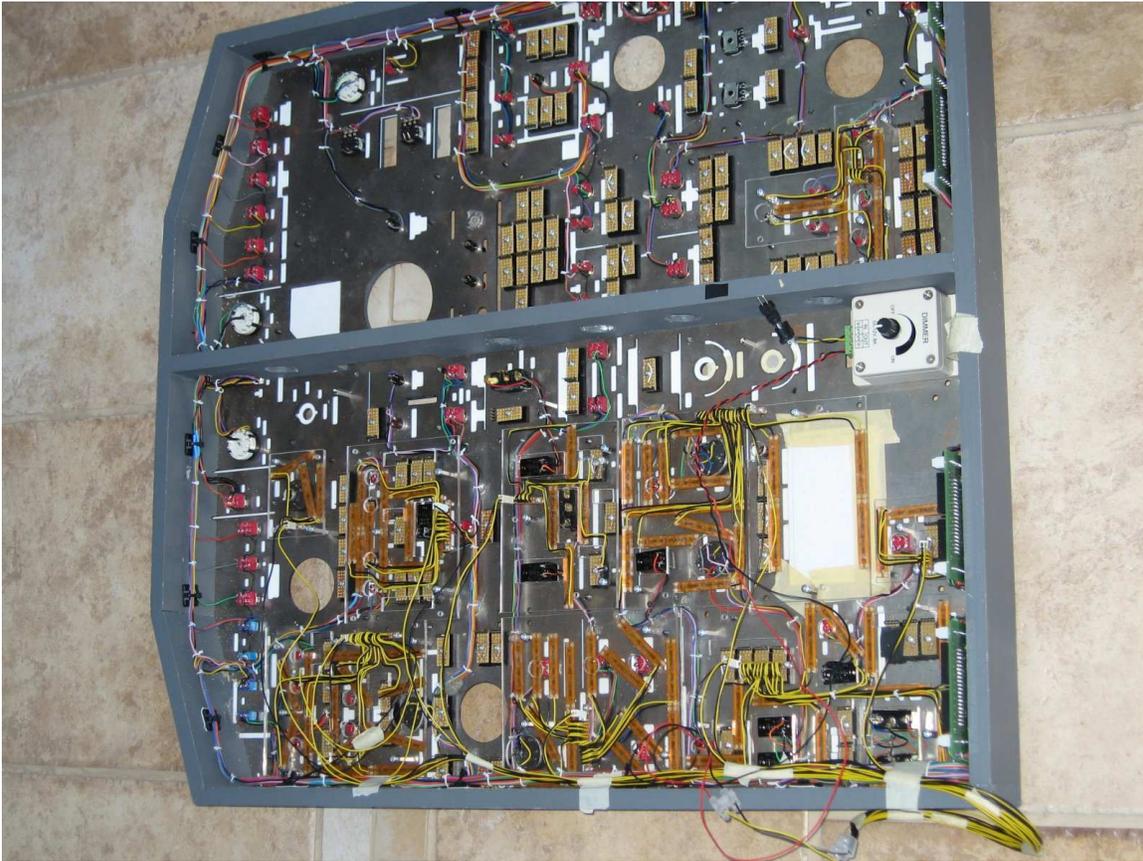
Layer One showing wiring to switches



Layer Two showing a typical Perspex light plate

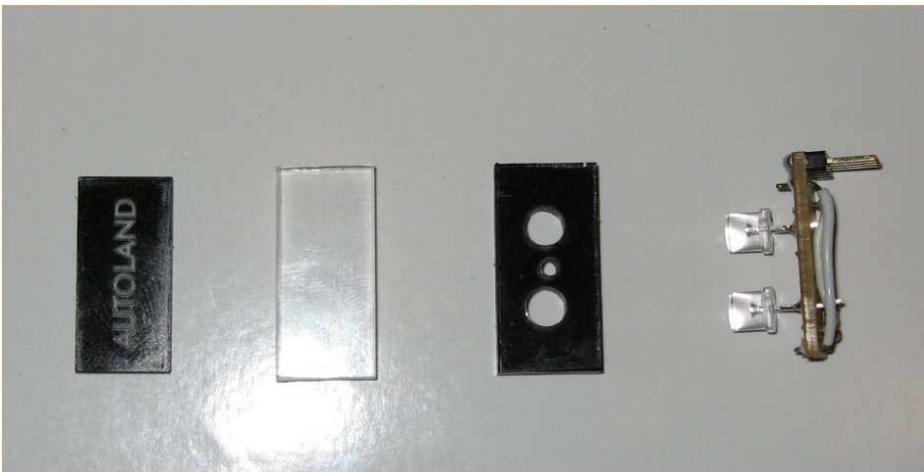


Layer 2 with light plates well advanced



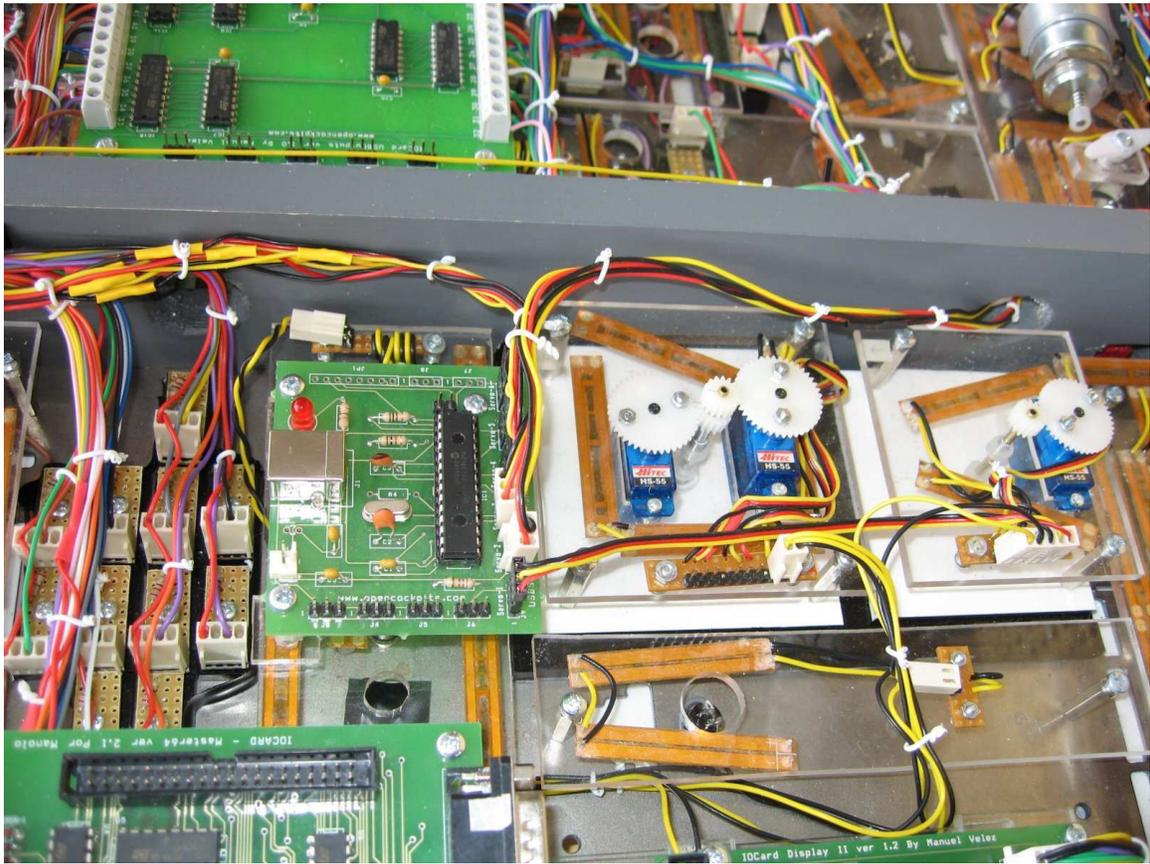
The annunciators, following a tip from the “Master” (Ian Sissons), were made from Perspex sheet cut out using a water cooled tile saw! Small pieces of veroboard were used to hold the leds, resistors and diodes where dual intensity blue leds were needed.

Picture of annunciator components



The gauges were made using Hitec HS-55 servos, as per the article on “Making a Brake Pressure Gauge”, except that some gauges needed dual servos with concentric shafts.

Picture of Gauge Construction



Opencockpit I/O cards were used comprising

- One USB Expansion card
- Two Mastercards (for the number of inputs required)
- Two USB Output cards – I could have used the Mastercard outputs, but would have limited the current draw for the annunciators to 20mA each
- A USB servo card, though with only 6 outputs this was not enough, though I can supplement this from another USB servo card mounted on the MIP

The Elec DC/AC/CPS panel and “FLTALT, LANDALT” displays were made by using OC 7 segment display pc boards mounted onto a carrier panel

Rear View of Overhead showing OC Cards and annunciators wired up



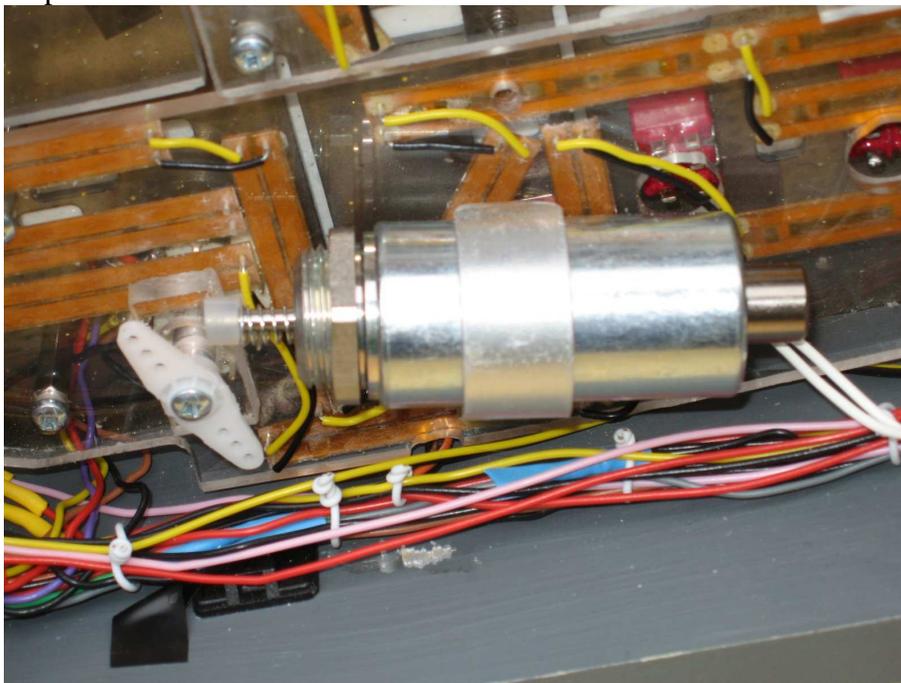
Rather than have many USB cables trailing back to PC`s, I installed a D-Link 4 port hub within the overhead – do not use cheap Chinese ones from Ebay, they are rarely any good and it is likely that Windows will not recognize them

The backlighting is dimmable and controlled by the “Panel” pot using a 12volt dimmer easily purchased on Ebay. I removed the electronics and resited them into the overhead as per next picture

USB Hub and to the centre right the stripped dimming electronics wired up to the “Panel” pot



I copied an idea seen on Mycockpit to make the “Starter Switch” return to “Off” after ignition by modifying a rotary switch and using a “push” solenoid, activated from an output



Completed Overhead Front view



Close up front view



Another!



Trying to get good photos of backlighting is beyond my equipment and skills, so this is the best I can do, though it does not do justice!!



Finally, a supporting word for Sim-Avionics software which has the inbuilt logic for the complete overhead and only needs a .ini file edited to link with a SIOC programme to control the I/O. It is amazing to find that when you turn the “CONT CAB” pot to increase the temperature, the actual air temp gauge responds accordingly, now that is simulation! Sadly, though Sim-Avionics is now probably priced out of many enthusiast`s reach.

Hope you all enjoy this article and if you want any further info then please PM me at Mycockpit.org where my username is fordgt40 - it`s now beer time ☺

PS

I know that the landing light special toggle ends are missing – I need to get some toggle switches where the actuator arm does not rotate!