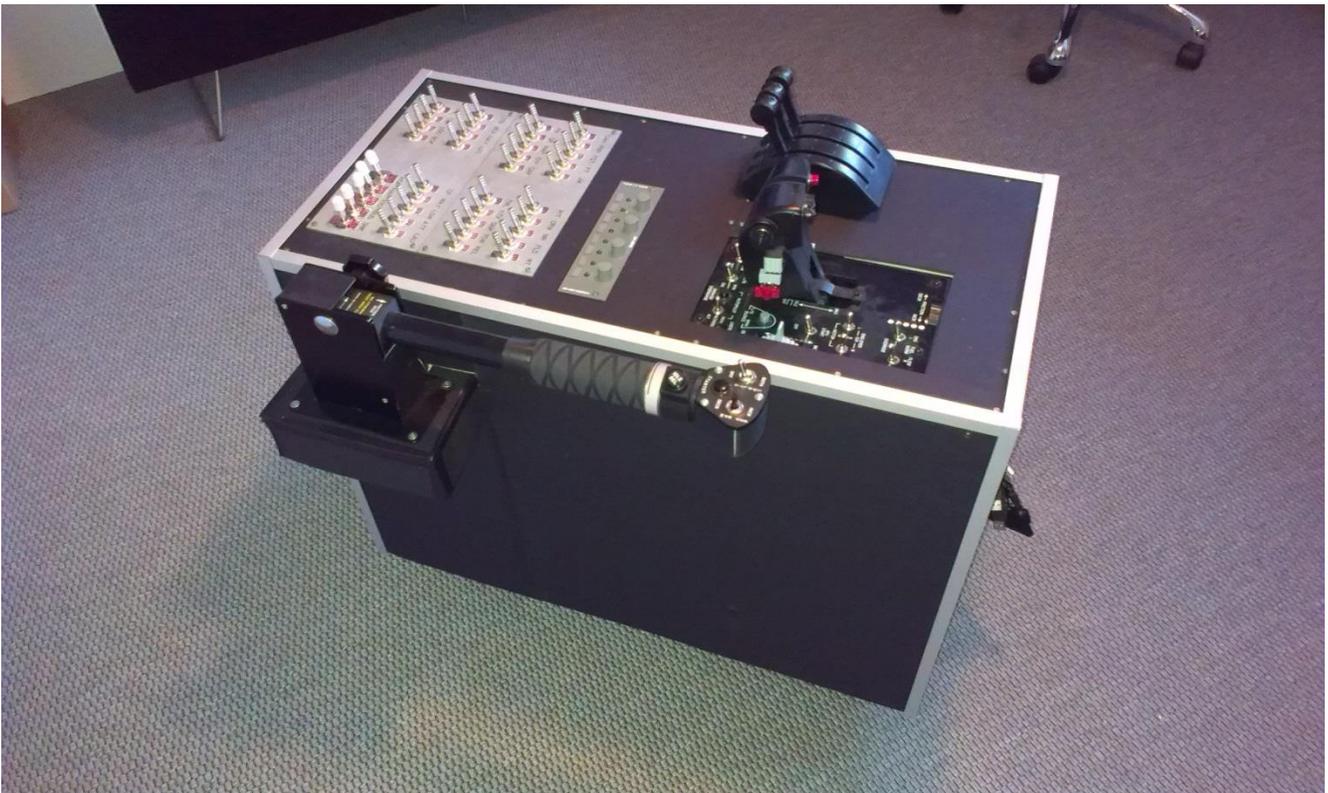


Project Throttle-Console

By Rays Aviation

Intro



My name is Raymond Andersen and some of you might know me better as Rays Aviation. I have been on a quest through various flightsim add-ons, hardware setups, complete cockpit environments and the home build cockpit modules etc.

During my quest I recently decided to do another build of my own. This time I wanted to build a low-cost console that could increase my flightsim experience without being a complete replica home-cockpit simulator.

The challenge was to build a center console that would fit my needs as an enthusiastic flightsimmer, meaning that I enjoy flying various aircraft with various configurations, and the console should be able to support all types of aircrafts – all from GA aviation to airliner simulation, helicopter simulation and even new age jet fighter aircrafts. This meant that the console had to be versatile and also able to be moved without problems – so how to do that.... well... it's all about getting ideas and have the drive to try out something new.

My professional background is within logistics but I have been a fan of aviation as far back as I can remember. So even though I have no professional skills of building electronic modules or home cockpits etc., I decided to try out my skills once again.

Previously I have built a test-rig (console), a modules set consisting of toggle switches and rotator switches, a single seated home cockpit and a twin seated home cockpit, but now I set my focus on a center console that should support specific throttles and a shared toggle switch modules set.

I am writing this article to show how easily it can actually be to increase the flightsim experience, and that it does not have to cost a million dollars. Much of the materials used for this console are materials that I have used for some of my previous projects, so indeed the total cost of this project was low.

However, I have also calculated the costs of the project without hardware (since that is up to the simmer to select which and how pricy that should be) and the total cost was only Dkk. 685,- = app. \$100,-

The hardware included in my throttle console was hardware that I already had in my private inventory but that could just as well be hardware from other manufacturers – I just decided to use the hardware that I had already purchased, so that my investment would be limited.



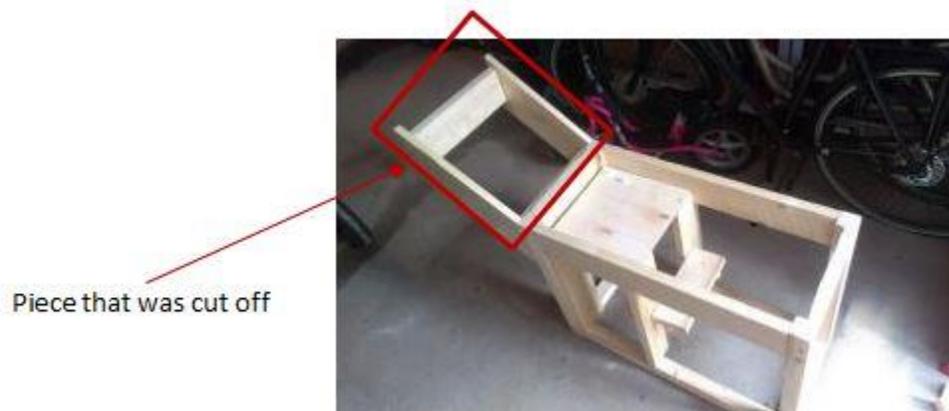
The build

Before I could start the build I had to do a little research to get an overview – I had to decide exactly what I wanted to build, what should be included, what kinds of materials should be used and estimate a budget for the complete build.

I decided that the project had to be a low-cost project with a very limited budget. I wanted to use the hardware that I already had, together with re-using some of the materials from previous projects.

The console should be a console supporting various throttles and a shared toggle switch panel. It should be movable and only use one USB cable for connecting to my computer.

From my previous twin-seat project I had a frame for a console build out of wood and that I thought could be just okay for this project as well. I stripped the old console so there were only the wooden frames left. Then I cut off the 45 degree angle piece in the front end of the console since that would be irrelevant for this project. I also changed the width of the console to be smaller because it was not necessary that it was that big.



Next step was to design the top of the console – which throttles should be used and where they should be placed - that together with the modules that I also wanted to include. After I had designed the layout of the throttles I started to place the support brackets (also made of wood) so that I could mount all throttles properly.

I included a total of 3 throttles on the console – one was the Saitek 3-lever throttle which I would use for GA and Airliner simulation, and that one of course had to be placed in the left side of the console since I normally enjoy flying those aircrafts from the left seat.

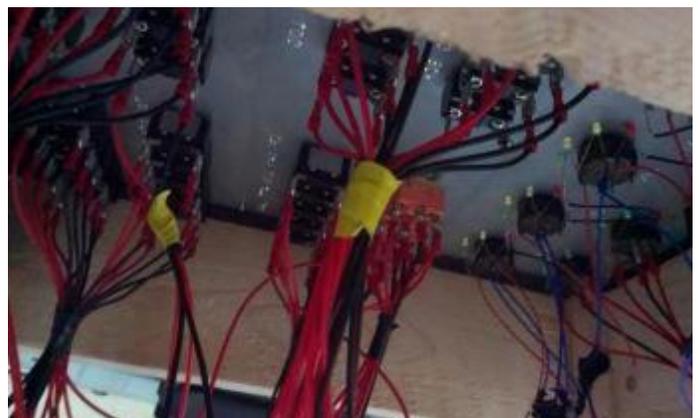
I wanted to mount this throttle with a 45 degree angle so that the throttle would have a more realistic lever movement. However that is not possible with the throttle as it is but I found a few solutions on the internet of some plastic brackets that could do the trick. This was just not what I wanted and they all seemed quite expensive, therefore I created two brackets out of wood and mounted them into the frame. Additionally I mounted two 90 degree angle brackets made out of metal for extra support - That did the trick and I was now able to mount the Saitek throttle unit perfectly in my opinion.

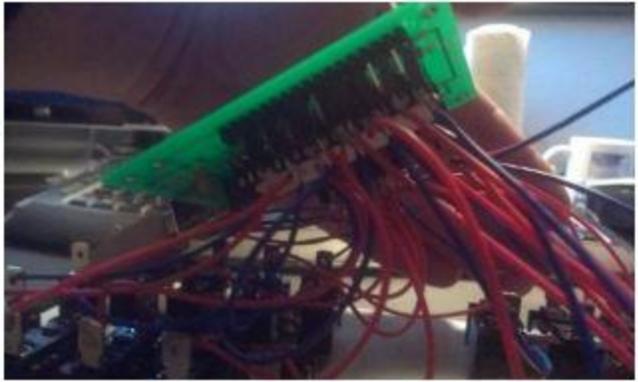
Then I mounted the Thrustmaster A10 Warthog dual throttle to the right of the Saitek throttle. This throttle unit I would use for flying various military jet fighter aircrafts or similar aircrafts with a HOTAS configuration. Mounting this unit was very easy – I just mounted a level support plate made of plywood and then the throttle on top of that.

Now I only had to find a solution for the helicopter configuration – I had the OE-XAM replica Bell B206 collective but I had to find a way to mount it on to the console. To be able to get the best grip on the collective it had to be mounted on the side of the console and not just on the top. Therefore I built a bracket (of wood) and integrated that on the right side of the console almost at the very back end and a little bit below the top plate. That gave me a perfect location for the collective and did not conflict with the other throttles and there were enough space for my hand etc.

Last step of creating the top was to add some toggle switch panels – I had from a previous project built some toggle switch panels and thought they were quite fine for this project as well. That meant that I didn't have to purchase additional modules, switches or even PCBs – I had all of that already and as extra I had an RP48 module from GoFlight which I decided to include as well.

The toggle switch panels are built using rocker toggle switches (heavy duty) that are mounted on some special water cutted metal plates with legends and thereafter connected to PCBs from DeskTopAviator. For more details about the toggle switch panels, you can read my previous article about that project also found at my website and Flightsim.com.





Now I had placed and mounted all the hardware that I wanted to include in this project, so the next step were to create a finish of the console. I had previously used a material called Kappa Graph which is a 5mm thick, easy to cut material and that was of course my choice again for this project.

I cut the huge Kappa Graph plates into smaller plates and mounted it between the throttles and modules on the top of the console. Thereafter I did the same and now covered both sides and the back and front end. The Kappa Graph is mounted on to the console using small screws.

I cut a small square hole in the front end of the console – this I did to be able to get the USB cables from all the modules/units. I placed a 4-way USB hub just inside the hole so it would be easy to grab, and then connected the USB cables from the RP48 module and the toggle switch panels -> these modules would always be active no matter which throttle solution I would select.

Now if I e.g. wanted to fly a helicopter, all I had to do was to connect the USB cable for the collective and then connect the USB-hub to the computer. If I then wanted to fly e.g. a Cessna, I would just unplug the collective and then plug-in the Saitek throttle instead and so on. I did try to have all throttles plugged in at the same time, but that gave me some conflicts between the throttles which of course could have been overcome by some minor programming, but this way was just as easy and simple.

I now thought that the console already was looking quite okay, but I needed to add a cooler finish. I went to the local DIY store and found some brushed aluminum pieces that had a 90 degree bend – these I really liked very much and purchased enough so that I could glue them onto each corner of the console thereby providing a crispier look to the console.

There was just one more small issue that I had to find a solution for. The console had to be movable meaning that changing from the various throttle configurations would also mean that I would change my seating. When I fly using a yoke I normally fly from the left seat, but when I fly with a stick or do helicopter simulation I normally fly from the right seat.

It was already possible for me to lift the console by hand and move it around, but that could be a whole lot easier I thought, so I again went down to the local DIY store and found some furniture wheels – there are several types of wheels with different quality and I selected a set of wheels consisting of 2 wheels with brakes and 2 wheels without brakes. These wheels I then mounted on to the bottom of the console and now I could very easily move the complete console within a few seconds.

Just a small tip; if you have carpets where you have your simulator, I would suggest that the wheels are wheels with a bigger diameter then just the small cheap ones – that gives a better and easier movement and they do not leave marks on the carpets after a longer period.

I had now finished the build and the result was in my own opinion quite okay – there are no need for drivers, no need for additional programming – everything just works perfectly. Of course I had to

program the RP48 and the toggle switch modules, but that was just one time I had to do so, and that was it.

To support this console I of course also have some additional controls. I have for the helicopter simulation a set of anti-torque pedals from OE-XAM and for other aircraft simulations I use the combat rudder pedals from Saitek. The helicopter pedals are just to add realism to helicopter simulation, but they could very easily be replaced by the pedals from Saitek, so that I would only have one set of pedals.

For controls I have the ThrustMaster A10 Warthog HOTAS stick which works perfectly flying various stick aircraft or even helicopters. I know that a stick is not a cyclic, but I didn't want to invest in a cyclic just yet.

For GA aviation and airliner aviation I use the B737 yoke from GoFlight which works beautifully with the Saitek throttle quadrant. The stick, yoke and rudder pedals are all connected to the computer using their own direct USB cables – however in most configurations of the console I do have a spare USB connector available, so that I am able to e.g. connect the stick to the hub inside the console if necessary.

I hope this article was an interesting read and potentially could help create some ideas for other flightsim enthusiasts as well. I would also like to thank flightsim.com for publishing this article.

Rays Aviation

