Lockheed HC-130H Hercules

United States Coast Guard No. 1711

By Beat Felber

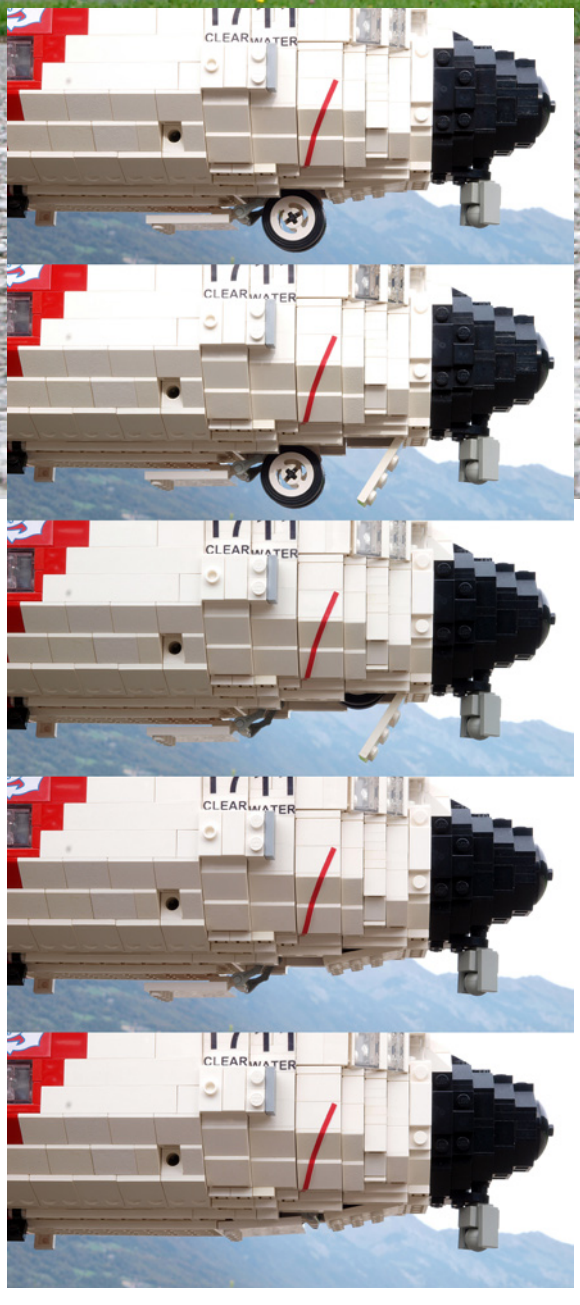
Probably still the most iconic transport plane, the Lockheed C-130 Hercules and its variants date back as early as 1954 when the first prototype had its maiden flight. The model I would like to present here, is quite a bit newer and belongs to the H-Series of the Hercules, with the A-Series being the first one to be produced. Nevertheless the plane I built my model after, is in service for the United States Coast Guard already since 1985.

The HC version of the Hercules is a series of special duty planes. They have been manufactured for the Coast Guard and the US Air Force only. The latter one uses the HC-130H for combat rescue duties, while the Coast Guard has more tasks for their Hercules' to fulfil. These include search and rescue, enforcement of laws and treaties, illegal drug interdiction, marine environmental protection, military readiness, International Ice Patrol missions and cargo and personnel transport.

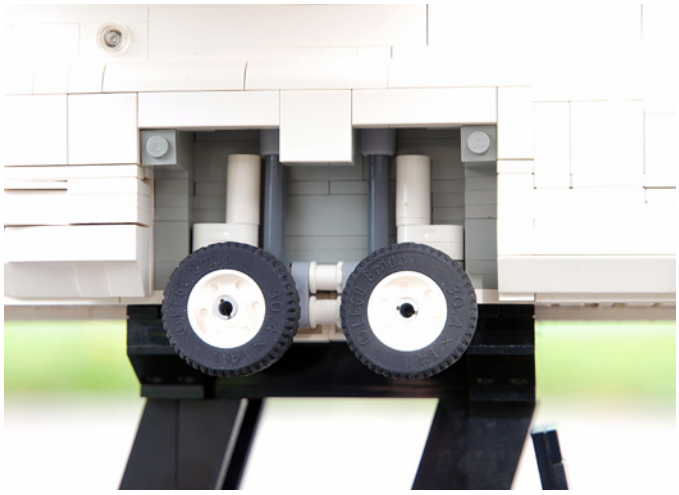
The Hercules is my first own creation of a plane for years. The idea to build it grew after I purchased a model kit of a Grumman F-14 Tomcat from www.mechanizedbrick.com and customised it a bit. I decided that I would like to have more plane models in about the same scale. Since Ralph Savelsberg - better known as Mad Physicist on Flickr - already built a great collection of famous planes, I would never be able to even come close to, with my first creation, I was looking for something I would be the first in by building it. So there was the Hercules. Thank you Mad Physicist for the inspiration I could draw from your creations!

The decision to build a Coast Guard version and the exact scale of 1:33.75 are the result of the same initial idea for one of the main features of the model. The construction of the retractable main landing gear dictated the diameter of the fuselage and therefore the remaining dimensions. The part I chose for the wheel well cover, #2585, Hinge Panel 2 x 4 x 3 1/3, I only had in white. So the main colour of the model was given. It later proved to be quite a challenge to model the diagonal red and white stripes around the fuselage. Maintaining the stability and still be able to equip the interior with details, meant that I could not use complex SNOT techniques to realise this design feature.

The first thing to start with were the mechanics for the retractable landing gear. Having chosen the Hercules and set on a big scale, meant that I would have plenty of room to incorporate these working features into the model. So this should have been quite easy. But on the other hand, the big scale meant a heavy weight, which had to be supported by the main landing gear. On the real plane, hydraulically driven jackscrews move the four individual struts for the four main wheels up and down in a vertical movement. The most realistic and most compact way to copy this feature on my



model was to use a set of four mini linear actuators. Now there was a problem. LEGO® had these mini linear actuators designed with a clutch mechanism incorporated. This means that one actuator is able to bear a force along its axis of movement of about the equal of a weight of 900 g. I could never expect the model to perfectly sit on all four main wheels in a manner that the weight was equally distributed among the four linear actuators. And even then, a total mass of 3600 g would not have been sufficient for a model of this size.

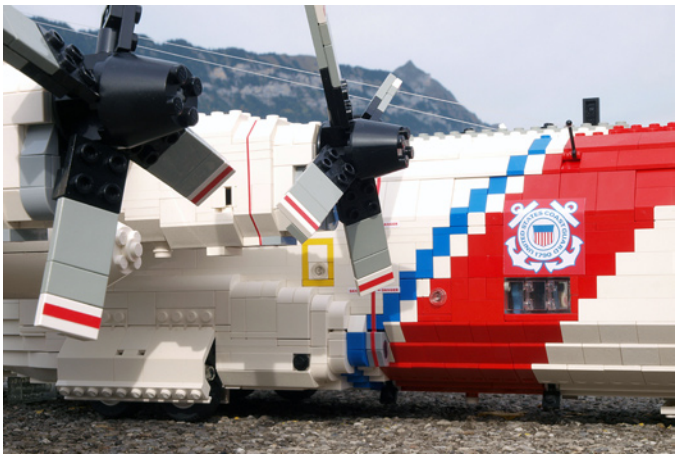


Therefore I decided to modify the linear actuators so that they could bear more load.

I would recommend though that you only do so, if you do not plan to use the linear actuator in a motor driven configuration. It would then not be the actuator to prevent the drive train from stalling, but the weakest part anywhere else. The modification is done by opening the actuator and remove a small rubber part which is stuck in an eye of a needle like opening in the top end of the orange jackscrew. This is where the clutch action takes place. Replacing the rubber part by a thick piece of cardboard or some plastic sheet prevents the top part from contracting and therefore renders the clutch useless.

The four linear actuators are all driven in unison by a simple drive train. In order to not to disturb the appearance of the model, the “hand of god” actuating tool can be removed. On top of the fuselage in the wing’s centre section is a Technic plate 2 x 4. Inserting a Technic axle with a knob on it in the centre hole, allows to wind the main landing gear up into the wheel well. The nose landing gear is driven by the same tool but independently from the main landing gear. A Technic brick 1 x 1 x 1 with hole on the right side of the fuselage is the only visible spot of the hidden mechanism. The nose landing gear is locked in both the extended and retracted positions by a bell-crank lever mechanism. The model is able to support its own weight on the landing gear. Nevertheless it is a bit heavy on the tail so that the nose landing gear only barely touches the ground. All wheel well doors are manually operable.
The construction of the centre section of the fuselage was straightforward with a lot of slope bricks involved. A bit more complex were the nose and tail sections, with the latter one being a SNOT construction to achieve the correct angle. The most difficult part though to build was the cockpit section, which included quite some special building techniques.
The real Hercules sports no less than 23 individual cockpit windows! I came up with a solution that still allowed to include a fully detailed interior. There are four seats in the cockpit for the pilot, co-pilot, engineer and radio operator as well as two crew berths. Two more seats are in the cargo compartment, one on each side behind a big side window, a speciality of the HC version C-130s. They are used while performing search duties.

To get a glimpse of the interior, the model features various operable doors. There is a crew entry hatch with included steps on the left side, right in between the cockpit and cargo sections and two paratroop doors on both sides at the rear end of the cargo hold. The latter ones swing open inwards to the ceiling, like on the real plane. Finally there is the two-part cargo door, with the upper part opening upwards and inwards, while the lower section serves as loading ramp and can be



lowered to the ground. Two optional small ramps close the gap between the runway and the main ramp and allow vehicles to drive into the cargo hold. The ramp can also be lowered to a horizontal position during flight, to airdrop parachute loads or to get a better view on the ocean surface while performing search duties.

The final sections to build were the wing, elevator and vertical fin. All of them feature operable control surfaces. On the wing there are ailerons and flaps. The Hercules has four turboprop engines of which two can be switched off to safe fuel. This is a feature used during search and rescue operations when the plane circles over the ocean at low altitude and speed to spot castaways. My model features four variable-pitch propellers, manually operated. The outer sections of the wing slightly sweep, beginning after the inward engines. This is also the place where the outer sections separate from the centre section to ease transport of the model. The drawback of this solution is that the wing slightly flexes, whereas it would have been possible to build it stronger by skipping the sweep and build it one-piece. Hanging in between the inner and outer engine nacelles are two underwing fuel tanks to extend reach. The finishing touches to the model are realised by small details like antennae, position and landing lights and a set of self-made stickers. The latter ones were printed on either transparent or glossy white self-adhesive film using an inkjet printer. To display the model with the landing gear retracted, I built a display stand. It is also very useful when extending the landing gear since it is difficult to hold the plane in one hand and operate the mechanisms with the other. Despite its overall dimensions and weight, it is possible to “swoosh” the model. The corresponding picture - which furthermore shows the builder - shall give prove of it.

Some specs of the model:
Scale 1:33.75
Length 90 studs
Wingspan 150 studs

About the author:
Beat Felber is a member of SwissLUG (www.swisslug.ch), the First Swiss LEGO® Club, and maintains a homepage called Engineering with ABS at www.engineeringwithabs.ch
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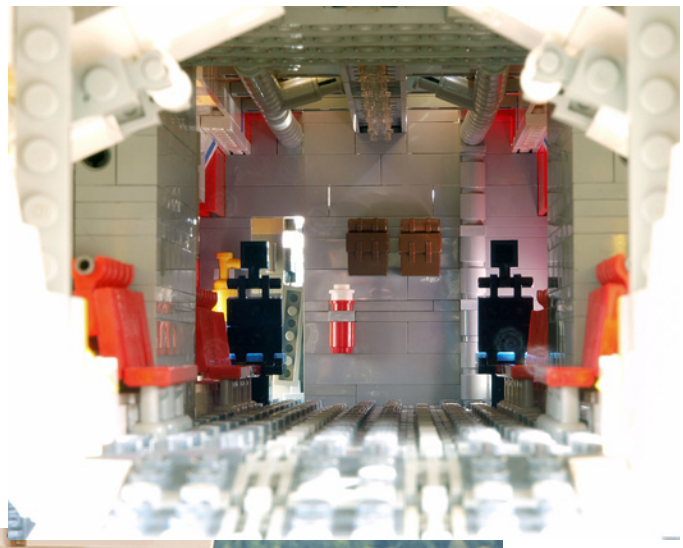


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