S90: History of a LEGO® Submarine

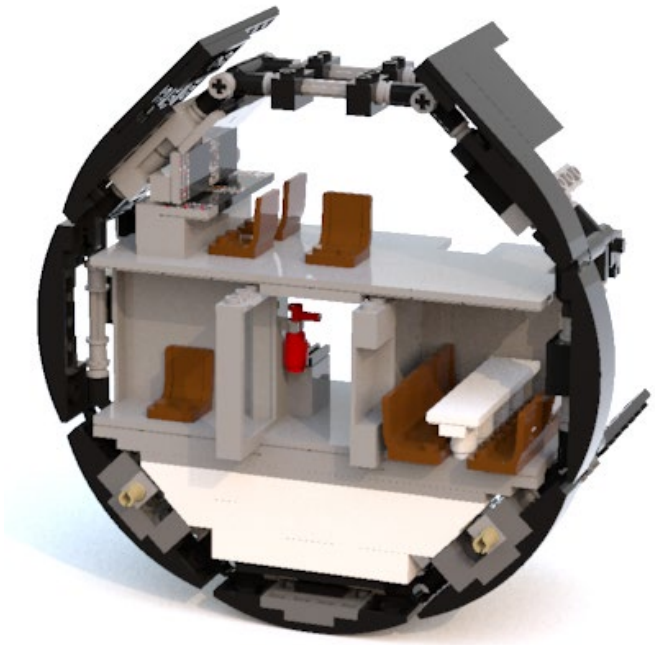
Text and Pictures by Sigpro

The first time I considered building a minifig-size LEGO® submarine was during the ALEBRICKS exhibition, on 23-24 April 2016. That was the second time I showed my Imperial Base and I wanted to build something else. My first task was to gather information, which was a long process, although I already had some knowledge of submarines (as I am addicted to movies like Crimson Tide, The Hunt for Red October and others), as my intention was to build something realistic.

The easiest solution was to find something under construction in Spain, and I came across a 2010 PDF file which explained the new S80 project for the Spanish Navy. This is a submarine class entirely designed in Spain, as an evolution of the French-Spanish Scorpène class, built equally between DCNS (France) and NAVANTIA (Spain, formerly BAZAN shipyards). This class is operative in Chile and Malaysia, with India and Brazil as future users. The future S80 class will incorporate AIP (Air Independent Propulsion), which is an electricity generator fed by a fuel cell. It extracts hydrogen from a bio-fuel and reacts with oxygen generating electricity, enhancing the submerged range up to three weeks.

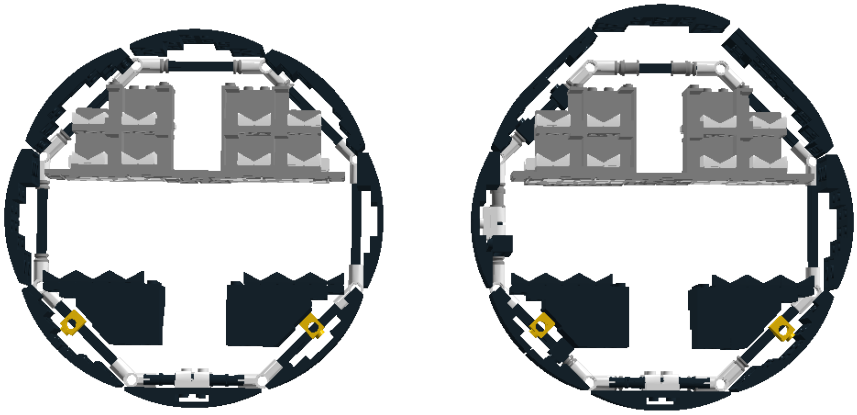
One of my main concerns was the scale. Minifigs are different to humans, as their big heads, broad shoulders and short legs must be adapted. After thinking carefully, I decided to use a scale of 1 stud = 33.5cm, so a standard minifig would be 175cm, which is average for a human.

Concerning the submarine itself, one of the advantages of current submarines is their clear external shape, however this required finding curved slopes which fit correctly. I solved this using an octagonal structure built from 7L axles and 135° Technic connectors, covering this with an 8-stud long cover with attached slopes.

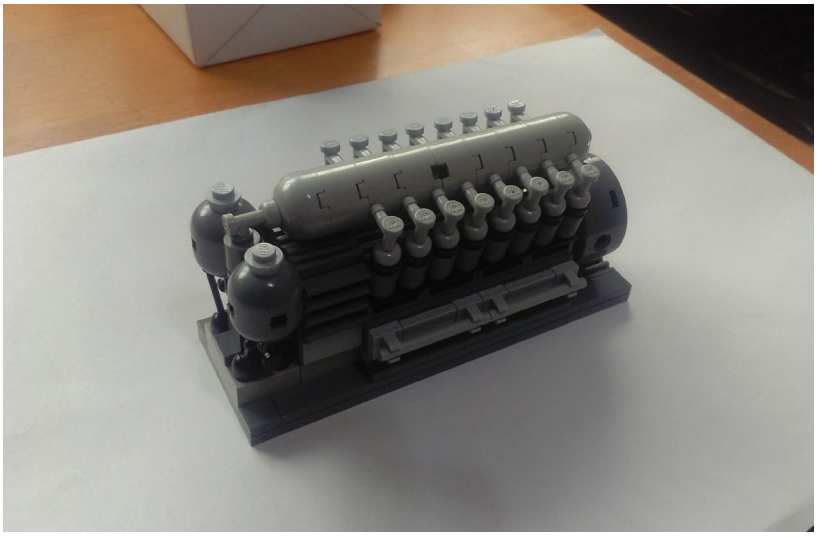


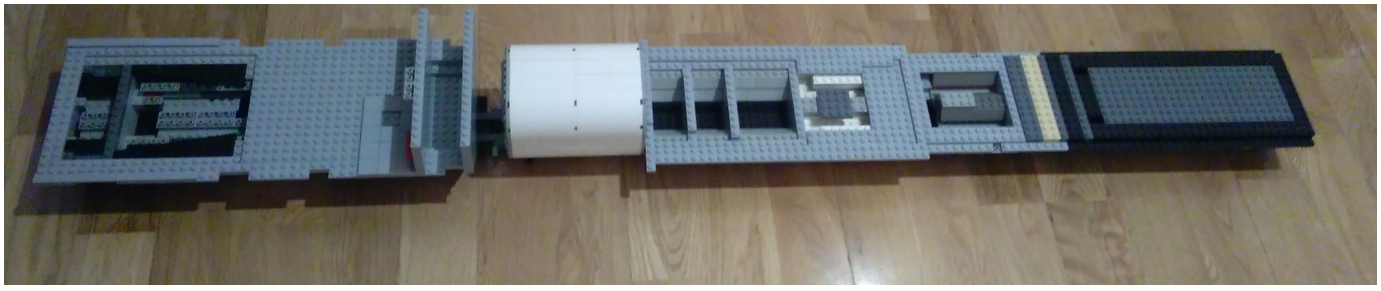
Interior space is essential when the dimensions are limited, so I had to strain my brain to save more room. From the initial to the final structure I changed the Technic bricks to Technic double bearings, which saved me two plates in height – not that much, but everything counts. Another decision was to divide the hull into 48-stud modules, as the shelves I have at home are about 100 studs long; I did this to save room at home.

Since the inception of the build in late April / early May 2016, to the first picture of the LDD design, barely three months had passed. However, a long process was still before me… the first evaluation in BrickLink to find the price of the submarine came to about 3000 Euros. This was because some LEGO® parts existed only in LDD and not in real life, or because the parts were scarce. And even then, after having the first LDD version of the submarine, I realized something was wrong. I hadn't included the 'hump' over the hull, so I had to modify the design to make it more realistic.



I kept on improving the design until the ‘definite’ version saw the light, and at the end of 2016 I started to buy parts. Although before that date I had already built some ‘simple’ equipment for the submarine, like the diesel generators (see pics), although I modified these later.
The submarine was growing and looking the part, from the bow to the stern. On 9 January 2017 I uploaded a picture that really showed how big the model would be.
The sail (i.e. turret or conning tower) was built in advance, but without the diving planes.





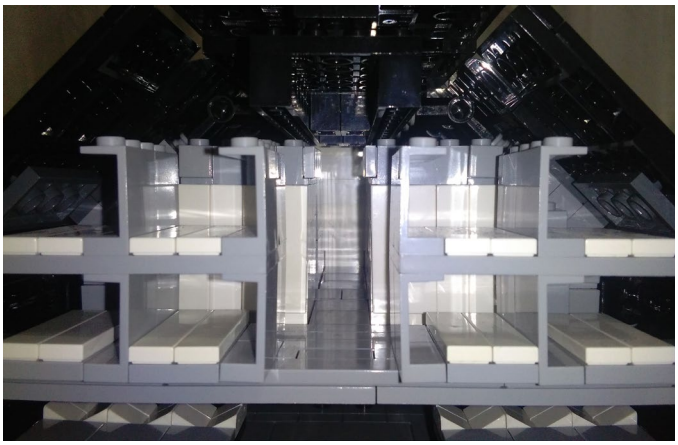
Then came the day where I had built something which was now clearly identifiable as a submarine (or at least half a submarine)

The stern was tricky! I decided to change my first design of a pump-jet to something better and more realistic (it took a few hours to modify the internal screw and the external shape).

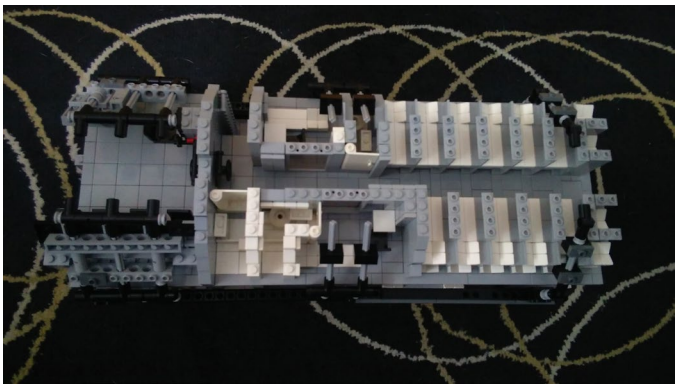
The completed submarine measures:
Length: 241 studs / 193cm, representing 81 metres at scale.
Beam (width): 22.7 studs / 18cm (approx), representing 7.6 metres.

Internal layout, from bow (front) to stern (rear)
Upper deck: bunks with two lavatories, command room with several rooms, AIP area, cofferdam, diesel and electric converters room and electric motor.
Bunks seen from the stern (those located in the bow)

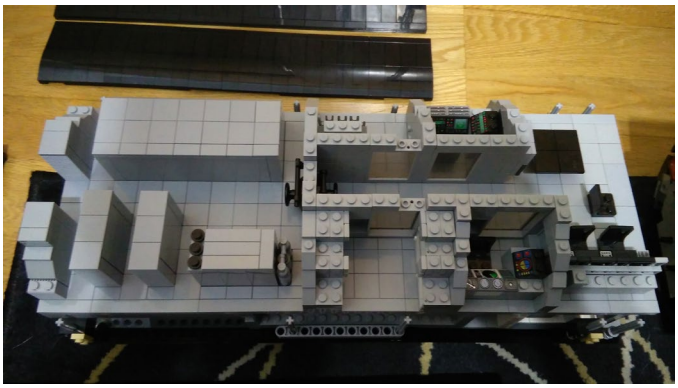
Rear command room and AIP area.



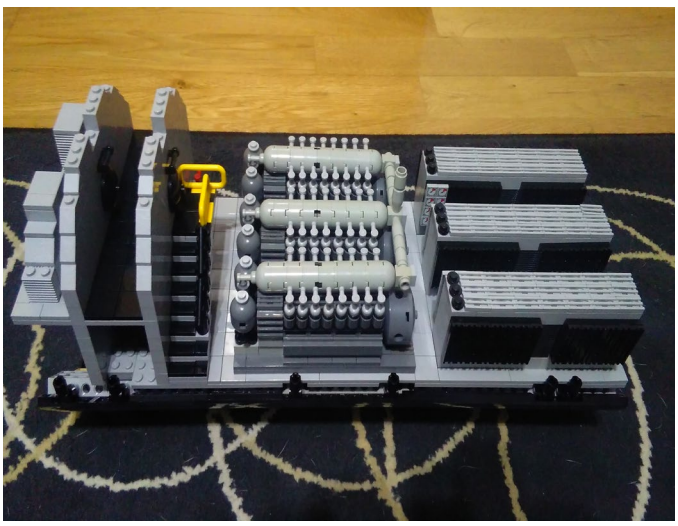
Top view



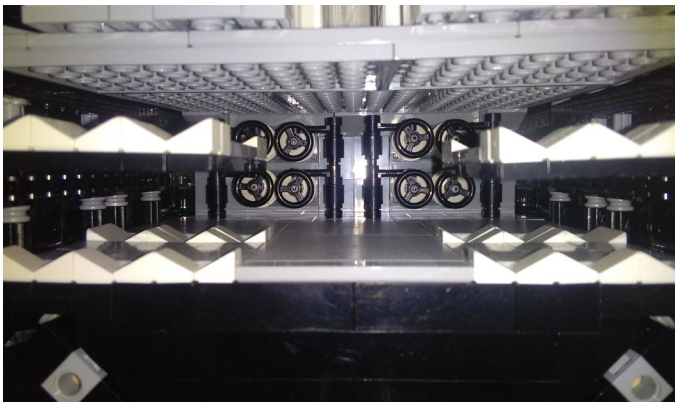
The use of custom stickers allows details like these sonar screens and damage control screens.

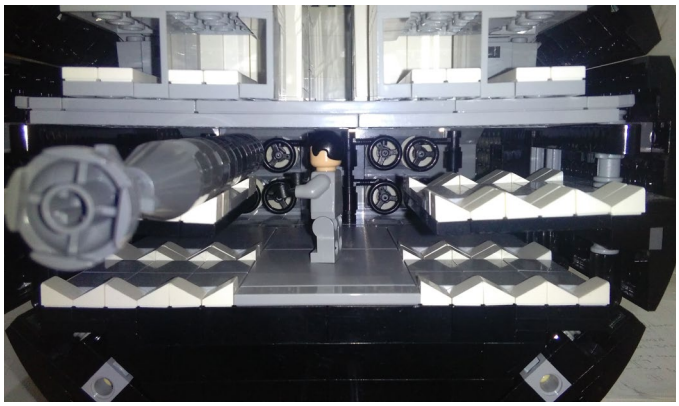


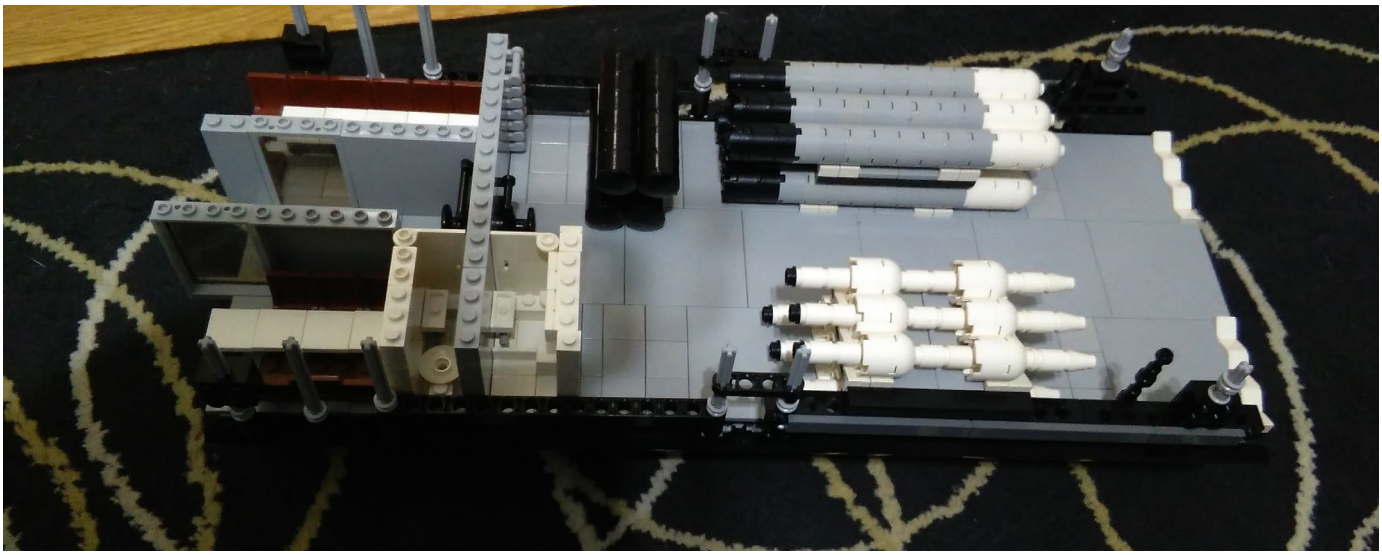
Cofferdam and engines.



Lower deck: weapons room (torpedos, missiles and mines), two lavatories, mess halls, kitchen and two pantries.
Detail of the eight torpedo tubes and a poor sailor. The ceiling is very close!

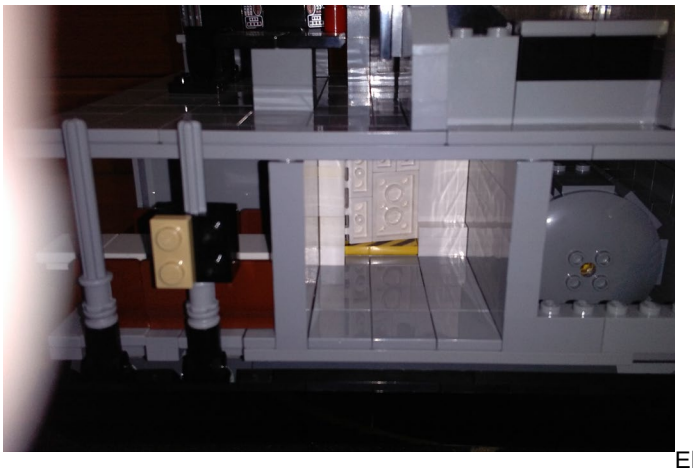






Kitchen, freezer (port side).

Kitchen, fridge (starboard side).



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The submarine holds a total of 40 minifigs. Two of them have individual cabins and the Captain's one has its own shower. The rest of the crew have two showers and two WC.

The submarine has eight torpedo tubes, and the weapons room can hold 24 'long weapons' (i.e. torpedoes or missiles) and 4 'short weapons' (i.e. mines). Each storage position for a long weapon can hold two short weapons.

You can see the whole project in https://www.flickr.com/photos/28966137@N03/albums/72157667570670032/with/28851370245/

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