



Navantia



Spanish Navy

≈Fene-Ferrol Shipyard

**STRATEGIC PROJECTION SHIP**

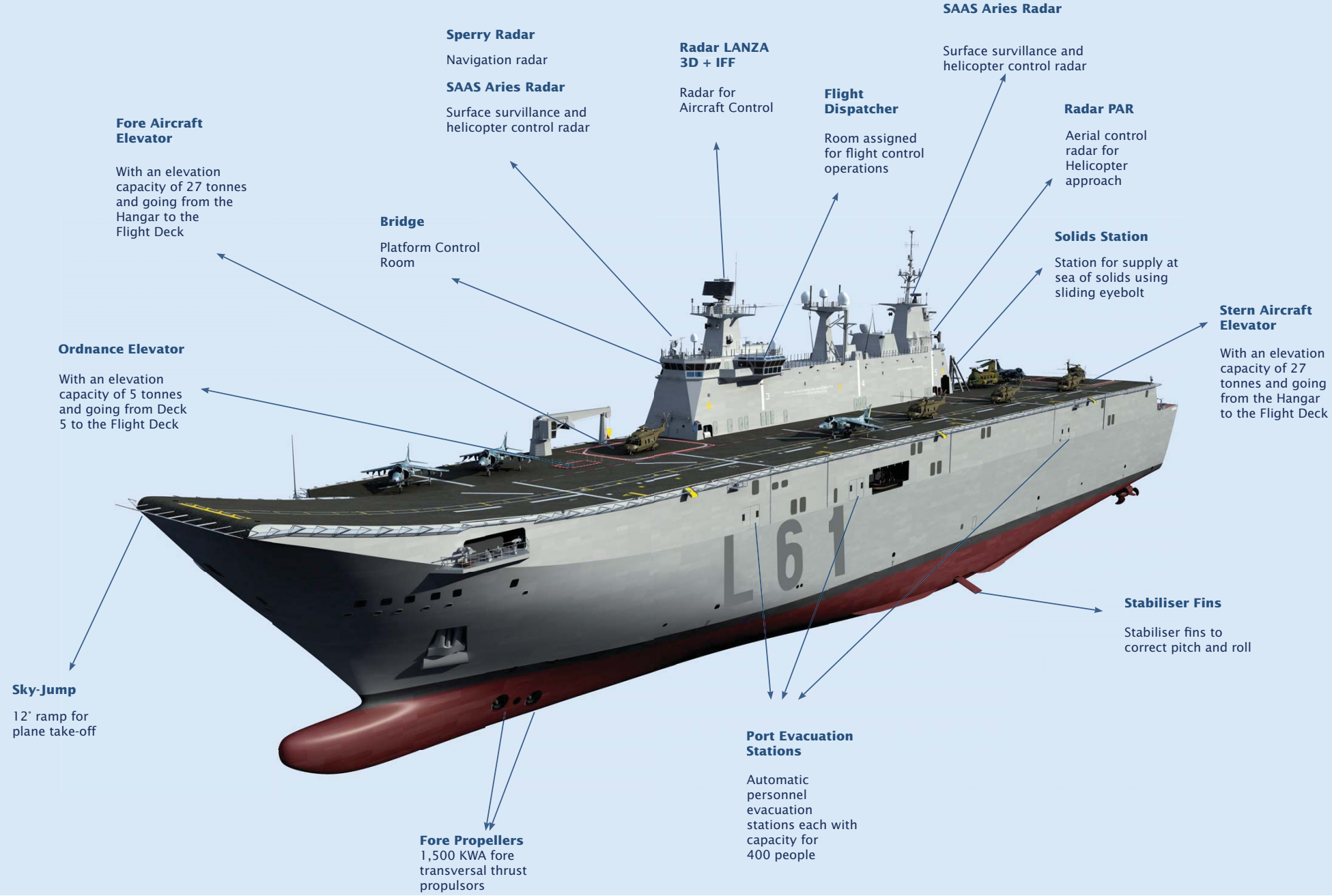
**LHD "JUAN CARLOS I"**



Navantia

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### Flight Dispatcher

Room assigned for flight control operations

### Hangar, Light Cargo Garage

Room used for transport of Aircraft and/or Light Vehicles (2,880 m<sup>2</sup>)

### Sky-Jump

12' ramp for plane take-off

### Emergency Flight Dispatcher

Airborne Operations Control Room in emergency situations

### Accommodation Zone

Deck 2 used for berthing and mess areas for Crew and Embarked Forces

### Stern Aircraft Elevator

With an elevation capacity of 27 tonnes going from the Hangar to the Flight Deck

### Spaces for Stores and Machines

Decks 5 and 6 used for spaces for Machines, Refrigerated Spaces, Storerooms and Stores

### Heavy Cargo Garage

Room used for the transport of Heavy Vehicles with a maximum of 65 tonnes (1,400 m<sup>2</sup>)

### Ballast Tanks

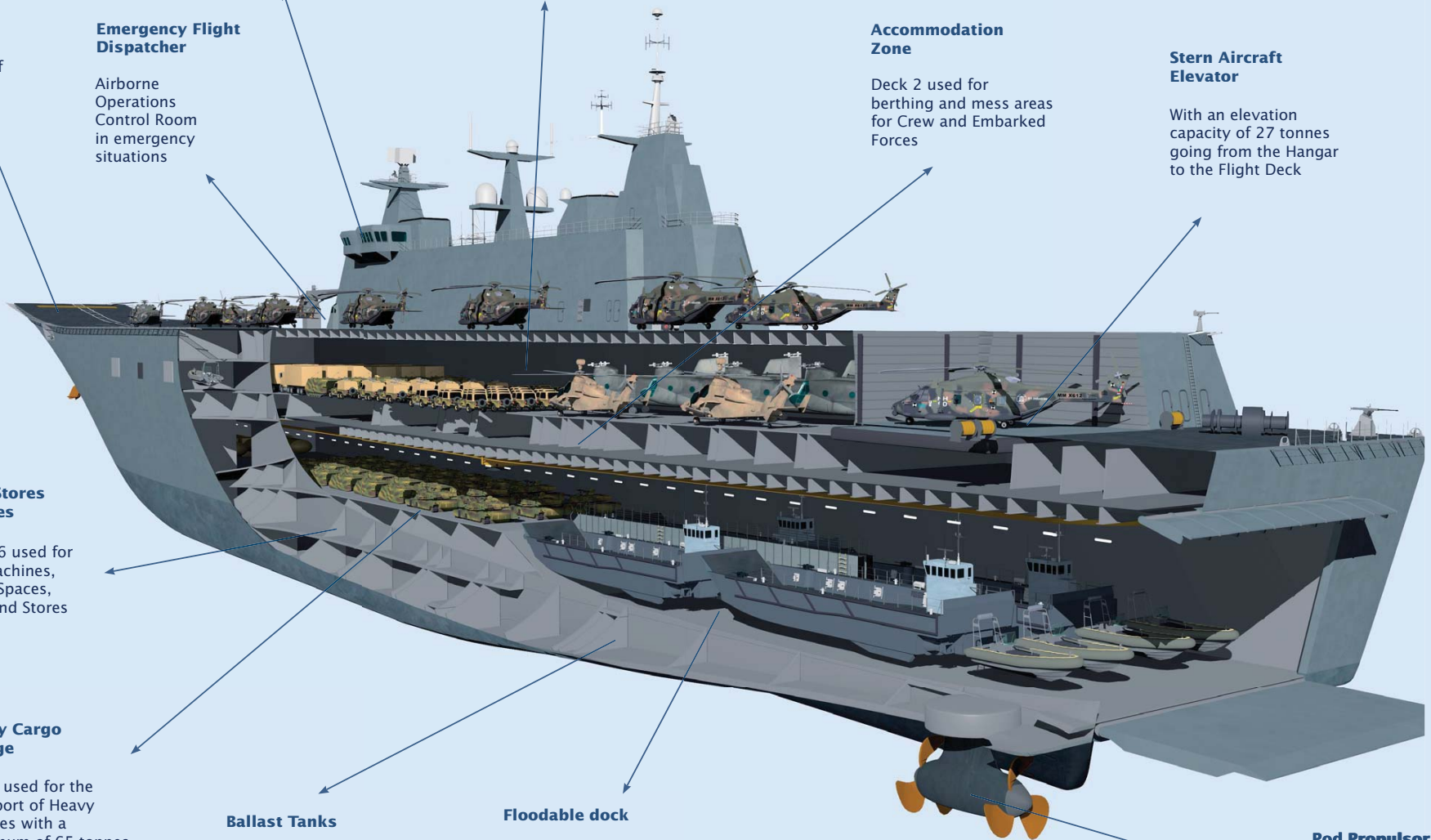
Tanks used for ballast to achieve the appropriate draught for flooding the Dock

### Floodable dock

Space used for the transport and setting afloat of 4 LCM's and 4 SuperCats

### Pod Propulsors

Azimuthal electrical propellers with two Propellers each one directly connected with 11,000 KWA





Historical profile



This ship is the biggest warship ever built in Spain and is named after H.R.M. King Juan Carlos I by the Ministry of Defence Ministerial Order 600/16679/06. This is in keeping with the Spanish Navy's long tradition of naming one of its main ships after the reigning monarch, a tradition that has been in place since the House of Borbon came to the Spanish throne in 1700. The same honour was awarded to the following ships:

- The ship "Real Felipe", built in 1732 at the Guarnizo shipyards (Santander).
- The ship "Real Carlos", built in 1787 at the Havana shipyards.
- The ship "Fernando VII", launched in Ferrol in 1791.
- The ship "Isabel II", built in 1852 at La Carraca.
- The cruiser "Alfonso XII", built in Ferrol in 1892.
- The battleship "Alfonso XII", built in Ferrol in 1913.

Contractual and Construction Milestones



The process of obtaining the ship started in May 2002 when the Naval Chiefs of Staff drafted a document setting out the Navy's need for at least one multi-purpose ship that would contribute to the capacity for strategic deployment of Marine and Army Forces and would also constitute a platform that could enable carrier-based aircraft operations. The contract specifications were drawn up in 2003 containing a detailed definition of what the ship was to be like, and in March 2004 the Navy and Navantia signed the Execution Order.

The process started in January 2005 with the cutting of the first plate, and in July 2006 the first block was laid on slipway number three at Navantia's Shipyard in Ferrrol. This ship was built using the most advanced modular naval shipbuilding techniques, preparing the ship in parts (blocks) that were subsequently assembled on the slipway. The ship was launched on 10 March 2008 at a ceremony presided over by H.R.M. the King and was christened by H.R.M. Queen Sofia. She remained berthed in dock 10 at Navantia for the remainder of the subsequent shipbuilding process. The sea trials were carried out in September 2009, and later in May and August 2010.

The ship was added to the Navy's Official List of Ships on 30 September 2010 with pennant number "L-61" at a ceremony presided over by H.R.M. King Juan Carlos I. It is integrated into Group Two of the Fleet Naval Action Force. Her base station is the Rota Naval Base. The addition of the LHD "Juan Carlos I" to the Navy means an enormous quantitative and qualitative leap as far as capacities are concerned.

Ship Design and Mission

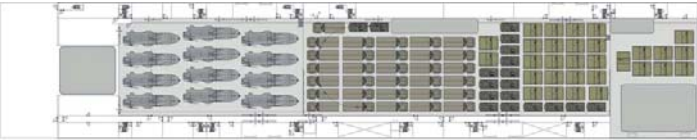
The "JUAN CARLOS I" is a single hull ship made of steel with the superstructure on the starboard side. Her design is based on a combination of military and commercial standards and specifications; the structure, equipment and materials follow Lloyd's Register of Shipping's civil standards, whilst her combat system, ordnance handling and stowage systems, systems of supply at sea, flight deck and the damage control system follow military standards.

The ship as being designed with four mission profiles:

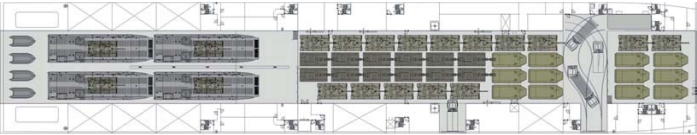
**AMPHIBIOUS SHIP:** Capable of transporting a Marine Infantry Force to carry out landing , supporting operations on land.

M.I. Force Landing transport scheme

Hangar and upper garage



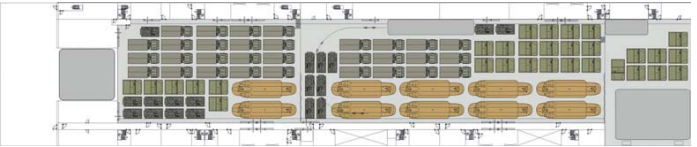
Dock and lower garage



**FORCE PROJECTION SHIP:** Transporting forces of any army to a theatre of operations.

Army Force landing transport scheme.

Hangar and upper garage

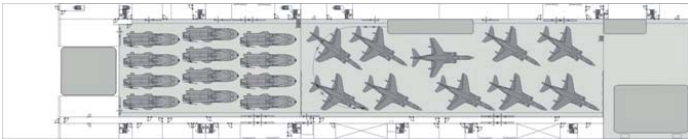


Dock and lower garage

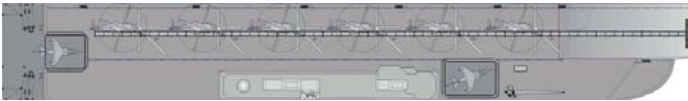


**AIRCRAFT CARRIER:** A temporary platform for carrier-based naval aircraft, acting as a flight deck for strategic projection airborne vectors (Navy's Air Wing), capable of becoming a temporary platform to substitute the aircraft-carrier, "PRINCIPE DE ASTURIAS", when she is not available due to downtime (repairs, modifications, etc.).

Aircraft carrier scheme



Hangar and upper garage



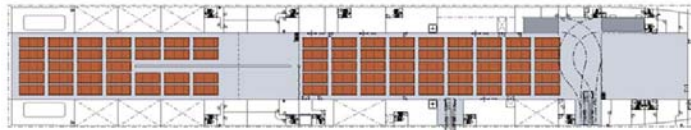
Flight deck with 6  
NH-90 helicopters in  
s  
imultaneous operations

**HUMANITARIAN AID OPERATIONS SHIP:** NON-WAR operations, humanitarian assistance, evacuation of crisis areas, hospital ship in areas affected by natural disaster, etc.

Humanitarian assistance container transport scheme



Hangar and upper garage



Dock and lower garage

Leading Dimensiones and Characteristics

The "JUAN CARLOS I" is the biggest ship and displacement that the Spanish Navy has ever had. Her leading dimensions are:

- Length overall ..... 231 metres
- Maximum beam ..... 32 metres
- Draught at full load ..... 7.1 metres
- Height ..... 58 metres
- Flight deck height over water level ..... 20 metres
- Maximum displacement ..... 26,000 tonnes
- Maximum displacement in Amphibious Operation .. 30,000 tonnes
- Maximum speed ..... 21 knots
- Range ..... 9,000 miles at 15 knots
- Crew ..... 261 persons



The "JUAN CARLOS I" is the Spanish Navy's first electrical propulsion ship with PODs. The POD propulsors consist of permanent magnet electrical motors mounted below the hull over a system that enables them to go in any direction. Each POD has two fixed pitch propellers. The "JUAN CARLOS I" PODs have been developed by the SCHOTTEL-SIEMMENS consortium. Their maximum consumed power is 11 MW each, capable of providing the ship with maximum speeds of 21 knots.

The ship's electrical power is generated by two MAN 32/40 diesel engines capable of generating 7680 kW each, and a 19,750 kW General Electric LM-2500 gas turbine. The final electrical generation capacity is 34 MW, which would be sufficient to supply a town of 10,000 homes.

The entire propulsion system is supervised by the SICP (Integrated Platform Control System), made up of a network of automats and computers to provide monitoring and control of all the electrical and auxiliary plant, handling more than 50,000 signals in real-time.

It has two 1,500 kW manoeuvre propellers afore, which along with the PODs' azimuthal capacity provide the ship with excellent manoeuvrability.



Sensors, weapons and combat system

With the exception of the SPERRY navigation radar, the ship's radars have been designed and manufactured by INDRA:

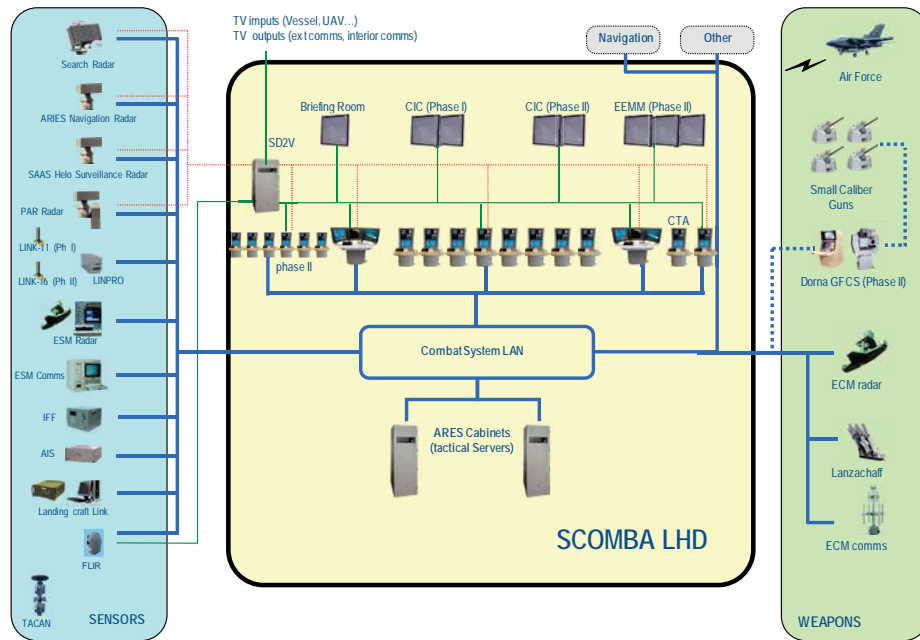
- LANZA-N three-dimensional radar: This is an aerial exploration radar with a maximum range of 180 miles and is the naval version of the radar used by the Spanish Army in its aerial surveillance radars.
- ARIES Radars: Set of two twin surface surveillance and helicopter control radars, one fore and the other aft of the superstructure.
- PAR (Precise Approach Radar): Approach radar used to control aircraft coming in to land on the flight deck and for control of air space.

REGULUS and RIGEL electronic warfare equipment, which are also domestic developments from INDRA.

Data from the sensors are processed in the SCOMBA combat system. The SCOMBA programme was developed by the Navantia Sistemas FABA for new buildings of ships for the Spanish Navy: a common nucleus of combat Systems was created with a capacity to be used in any type of ship, exploiting the information of their particular sensors. SCOMBA integrates the entirety of the ship's sensors and has a capacity to integrate easily any new sensor or weapon that is required in the future.

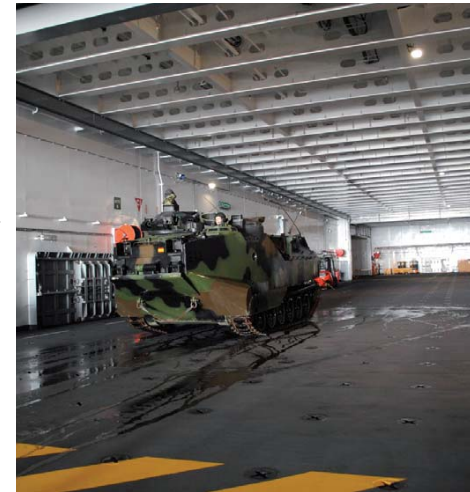






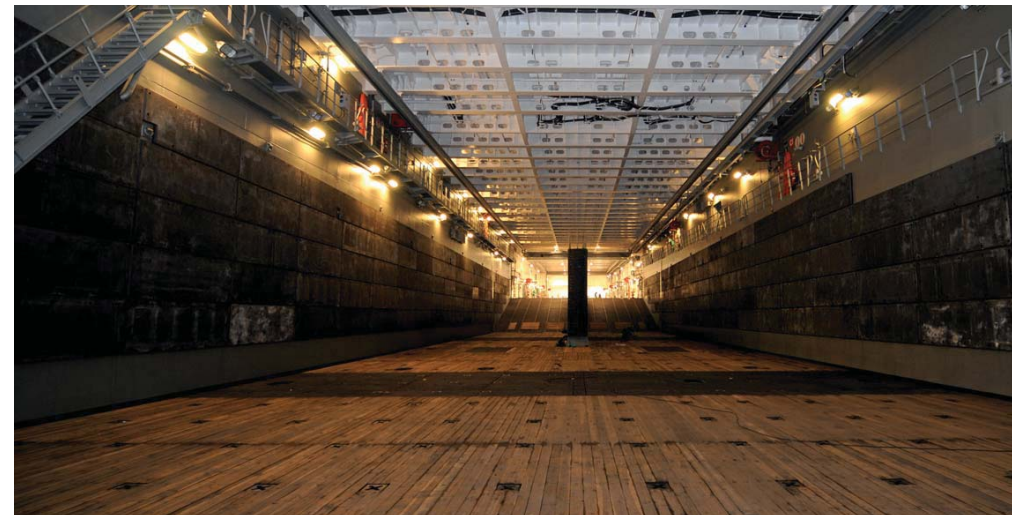
The total cargo and force projection capacity of the “JUAN CARLOS I” is comparable to that jointly provided by the “PRINCIPE DE ASTURIAS” and the two “GALICIA” Class LPDs. She has 5,445 m<sup>2</sup> of useful surface area for cargo, distributed on three decks:

- Garage for heavy loads, with 1,410 m<sup>2</sup> and a capacity to house 29 Leopard or similar battle tanks, AAV amphibious vehicles and practically any type of caterpillar track vehicle, as well as 16 tonne TEU cargo containers. Its length is 90 metres, with a width of 16 metres. On the starboard side there are two side ramps that enable the embarkation of vehicles and cargo from the dock.
- The dock, with a surface area of 1,165 m<sup>2</sup>, is capable of stowing 17 Leopard type battle tanks, thirty two 16 tonnes TEU cargo containers or 4 LCM and 4 supercat vessels. It has a length of 69.3 metres and breadth 16.8 m. and can be flooded until reaching 3 metres of draught in its interior. It is divided into two dry dock or “beach” areas and can operate with LCM craft, AAV amphibious assault vehicles and LCAC hovercraft. There is a ramp astern which on opening communicates it with the exterior, and it has a capacity to operate as a Ro-Ro ramp.
- Light cargo garage (deck 1) of 1,880 m<sup>2</sup>, with a capacity to house light vehicles (Lorries, Hummer, BMR or Mowag Piranha) or sixty seven 16 tonnes TEU cargo containers. It has a length of 92 metres and breadth of 20 metres, and has a fixed transfer ramp on the port side for vehicles to go to and from the heavy cargo garage.
- A 900 m<sup>2</sup> hangar on the same deck as the light load garage, with length 42 m. and breadth 20 m. It has a capacity to take 9 Harriers or 8 Chinooks.



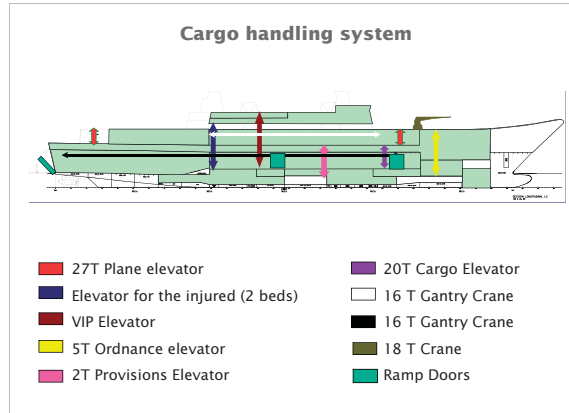
The ship has been conceived as a “protected unit” in the sense that her defence is charged specifically to other units that may be submarine, surface or airborne and is in all cases a “valuable unit” because of its nature and the cargo she carries on board. For this reason the weapons on board are limited to four 20 mm cannons that provide moderate close-in self defence. She has a reserve of space and weight so that self-defence weapons may be integrated in a later phase: MK-38 assemblies (automatic system with remote control from the CIC) for asymmetric defence and 2 SEA RAM assemblies for anti-missile defence.

On a Command and Control level, the ship should integrate all the domestic and NATO systems in a wide set of classified networks that confer the capability to act as command ship at brigade level in amphibious operations and even as the naval HQ HRF command ship.





There are elevators between the different cargo decks and gantry cranes on these same decks, which provide great flexibility in the movement of cargo, vehicles and aircraft. The main ones are two aircraft elevators, which communicate with the hangar and light cargo garage, and the vehicle elevator, which communicates with the two garages.



The LHD has a capacity to berth a total of 1,435 personnel, as per the following normal distribution:

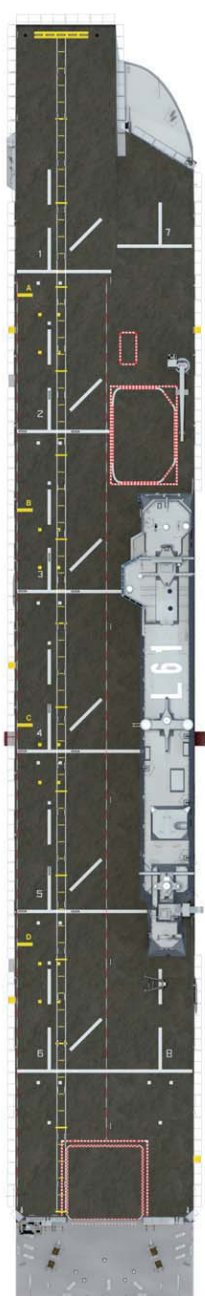
- Crew .....	254
- Embarked or transport forces .....	883
- Chiefs of Staff .....	103
- Embarked Air Wing Unit .....	172
- Naval Beach Group .....	23



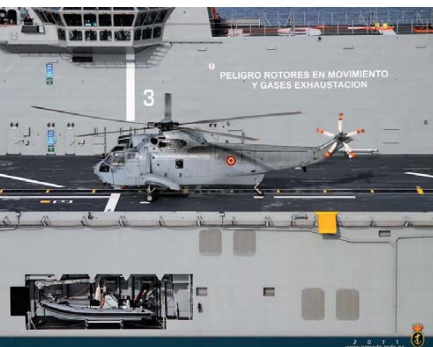
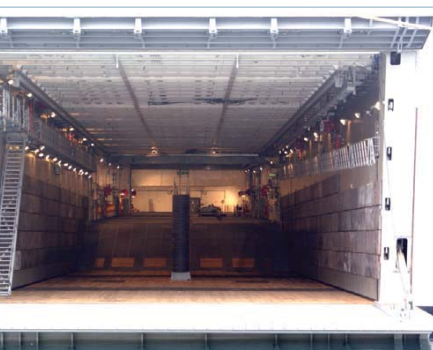
## Flight Deck Capacities

The need for a continuous flight deck was considered for its sizing, with the possibility of carrying out simultaneous flight operations with a least six medium-sized or 4 heavy helicopters. Assessment was also made of the space that would be needed for the hangar and the support and maintenance services of embarked aircraft.

The flight deck, with a maximum length of 202.9 metres and beam of 32 metres, goes from the prow to near the poop and has a design that brings to mind that of the other Spanish aircraft carrier, the *Príncipe de Asturias*. In the same way as this, the Spanish LHD has a kind of small jump to a lower level than the flight deck at the poop where part of the manoeuvring elements of an awning is found, as are various weapon systems for the ship's self-defence. The position of the two aircraft elevators are: one fore of the island superstructure on the starboard side and the other at the end of the flight deck. For its part, the runway has a 12° gradient or ski-jump afore to facilitate the takeoff of STOVL and to improve the loading capacity of fuel and weaponry. The design of this ramp is identical to that of the *Príncipe de Asturias*. On the runway it is possible to find up to 6 touchdown points for medium-sized helicopters (such as for example Sikorsky SH-3 Sea King, SH-60 Seahawk, or the more modern Eurocopter NH-90). As an alternative to the simultaneous operation on the flight deck of up to 6 medium-sized helicopters, up to 4 touchdown points are planned for heavy helicopters (such as the CH-47 Chinook or the CH-53 Super Stallion), which would also be able to operate simultaneously.







The flight deck has been designed to operate, launch, receive and provide support, both day and night, to planes and helicopters such as the third Squadron's AB-212, the fifth Squadron's SH-3D, and the ninth Squadron's AV-8B Harrier II Plus. As well as the aircraft in service with the Navy, the ship is able to receive the Army's CH-47 Chinook, Eurocopter Cougar and Tiger as well as the NH-90 when it enters into service with the Navy and with the Spanish Army. In a significant qualitative leap, this ship is also designed to operate with the STOVL version of the JSF, the F-35B Lightning II, if the Spanish Navy decides to acquire this exceptional plane. A touchdown point has also been reserved astern of the flight deck that is specially adapted (in dimensions and resistance) for the special needs of the new V-22 Osprey tilt-rotor aircraft.

For the transfer of aircraft between the hangar and the flight deck, the Juan Carlos I has two elevators, each with a capacity of 25 tonnes and sufficient size to be able to carry up to the new F-35B Lightning II, or a helicopter the size of a Chinook. The capacity of the hangar is variable depending on the mission profile. This means an area of 1,000 m<sup>2</sup> would be available for an amphibious type profile. This surface area could be increased by a further 2,046 m<sup>2</sup>, using the upper garage to have greater capacity for the aircraft. This means the hangar would reach 3,000 m<sup>2</sup> for an aircraft carrier type profile. The hangar itself, situated further astern, can house up to 12 medium-sized helicopters. In the case of the LHD operating as a temporary aircraft carrier, the vehicles and material would be substituted by between 10 and 12 STOVL planes, as well as the dozen helicopters previously mentioned. In order to provide support for airborne operations, it is estimated that the ship has sufficient fuel, spare parts and arms so that the embarked aircraft could carry out their operations without the ship needing replenishment for up to a maximum of 50 days.

The planned airborne capacity is for her to transport and operate up to 30 aircraft including medium-sized and heavy helicopters in amphibious operation profiles, or between 10 and 12 F35B planes or AV-8B+, plus a similar number of medium-sized helicopters when acting with an aircraft carrier mission profile at times when the Príncipe de Asturias R-11 is not operational.



## Capacities in Non-War Missions

These missions cover the spectrum that goes from any type of humanitarian assistance through to the concept of the ship as a coordination centre for civil authorities in any type of disaster. To do so, she possesses a capacity to house the civilian population (up to 1000 additional personnel, housed on the cargo decks in a CIMIC town, with reverse osmosis drinking water plants that enable the supply of drinking water to a total of 5000 people, and with her electrical plant enabling the supply of energy to small urban areas.

The ship has a complete hospital with ROLE 2+ capacity in accordance with OTAN classification. There are two operating theatres (one of them with a capacity for trauma care), a critical patient unit, a 14 bed hospital ward, a 4 bed infectious area, laboratory, radiology facilities, dental surgery, pharmacy, a sterilisation room and an area for classification of the injured. One of her main characteristics is an enormous capacity to produce medicinal oxygen, being able to cover all the requirements of the ship herself as well as to supply other displaced medical units.

The telemedicine system enables the support of all medical specialties from a reference Central Hospital, including surgical intervention, it also will be possible to carry out remote monitoring of patients when necessary.

