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Landing ship, landing craft and landing vehicle nomenclature

Some common amphibious shipping nomenclature and acronyms are clarified.

Landing Ships

A landing ship is a purpose-built troop transport ship modified to enhance its utility as a platform from which an amphibious operation may be launched and supported without relying on conventional port facilities.

The **Landing Ship, Tank (LST)** has a shallow draught to enable it to discharge personnel and vehicles through bow doors within wading distance of the beach.

Most landing ships, however, stand offshore where they are less vulnerable to attack from the shore and employ landing craft, landing vehicles and/or helicopters to transfer their cargo ashore.

The **Landing Ship, Dock (LSD)** *e.g.* HMAS *Choules*, carries its landing craft in a stern well deck ('dock'). To launch the landing craft, the well is flooded and the loaded craft can then sail out and back in through the ship's stern doors.

The **Landing Platform, Dock (LPD)**, in addition to a dock, has a short flight deck and a hanger to support limited helicopter operations.

The **Landing Platform, Helicopter (LPH)** or 'commando carrier' (*e.g.* HMS *Ocean*) is an aircraft carrier modified to embark and support helicopters, rather than fixed-wing aircraft. It has a full flight deck but no dock, so it cannot land equipment, such as tanks, which is too heavy for helicopters.

The **Amphibious Assault Ship (LHA/LHD)** combines the features of an LSD and LPH. It can use LCs to land heavy equipment. It also can serve as a 'lily pad' for fixed-wing fighter aircraft, enabling them to land, and refuel and rearm, before taking off again. Most also have excellent command, fire control and logistic facilities, including hospitals, designed to facilitate 'sea basing'. The 40,000-tonne US Wasp-class LHDs have better dock facilities than the older LHAs. They can carry 1870 troops, 12 landing craft and 32 CH-46 Sea Knight helicopters. In their secondary role as a sea-control ship, they can operate 20 AV-8B Harrier II [vertical/short take-off and vertical landing (V/STOVL)] ground attack aircraft.

Australia is acquiring two 27,500-tonne **Canberra-class LHDs** to be commissioned as HMA Ships *Canberra* and *Adelaide*. Their shallow draft will enable operations in littoral waters. They will have a range of 9000 nautical miles at a cruising speed of 15 knots. They will be able to embark 1050 troops, 110 vehicles, 11 helicopters and four landing craft (LCM-1E); and deploy up to 200 troops (a company group) in one helicopter lift. Their hulls have been configured to optimise the helicopter role and while STOVL aircraft (*e.g.* F35 Lightning II B) will be able to land and take off from them, they will have little if any capacity to refuel and rearm the aircraft; and the deck will be unable to sustain frequent STOVL landings.

Landing Craft and Vehicles

By the start of World War II, the landing craft (LC) had replaced rowing boats for ferrying troops and stores from ship to shore. LCs have a flat bottom, enabling them to reach the beach, and a bow ramp across which troops disembark within wading depth or at the waterline. Typical early ones were the **Landing Craft, Vehicle and Personnel (LCVP)**, capable of carrying 36 men; and the **Landing Craft, Mechanised (LCM)**, of various dimensions. The more recent 100-tonne **LCM Mark 8 (LCM-8)**, still in service, can transport 200 personnel, 50 equipped troops, 54.5 tonnes of cargo, or a main battle tank.

During the Pacific War, it often proved difficult to find beaches suitable for amphibious assaults and where they existed, the route to them at times was impeded by coral reefs, impassable to landing craft. To overcome this, the **Landing Vehicle, Tracked (LVT)** was developed which could drive over any reefs encountered. Being tracked, it could also drive across the beach and disembark assaulting infantry at the back of the beach or beyond. Modifications to enhance troop safety included armour protection, a stern (rather than bow) ramp, and a heavy machine gun to provide covering fire during disembarkation. By the war's end, the **Amphibious Tractor** or 'Amtrac', which embodied the foregoing features, had become the preferred **Amphibious Assault Vehicle (AAV)**.

The current US Marines **LVTP-7A1 (AAV-7A1) Amphibious Assault Vehicle** can carry a marine platoon from shipping over-the-horizon to its objective inland and, while a compromise between a modern landing craft and a terrestrial armoured personnel carrier, it is preferred to both for ship-to-objective manoeuvre.

The **DUKW** or 'Duck' is a 2-tonne 6x6-**Wheeled Amphibious Truck** developed in World War II for the transport of troops and cargo across the beach and beyond. It has more land mobility than the LVT but, because it lacks armour and is slow and bulky ashore, it is primarily employed on ship-to-shore transport of logistic supplies.

Australia is equipping its LHDs with the 100-tonne **LCM-1E**, especially designed for the Canberra-class LHDs, to deliver troops and equipment, including the Abrams main battle tank, from over-the horizon to the shore. It incorporates a bow ramp and a stern gate, facilitating the loading/unloading of rolling stock within the flood levee and the transfer of vehicles of up to 12 tonnes from one barge to another. However, it cannot traverse coral reefs, transport an assaulting force across a beach, or transport commandos to their target in ship-to-objective manoeuvre.

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