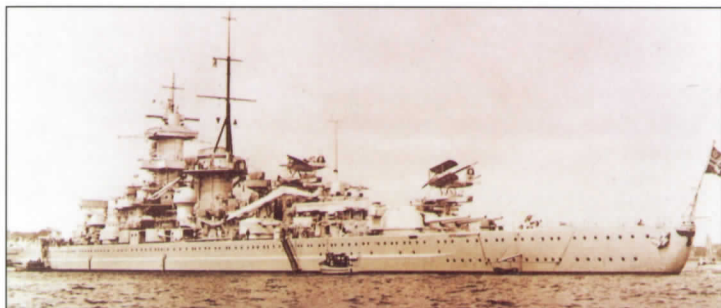


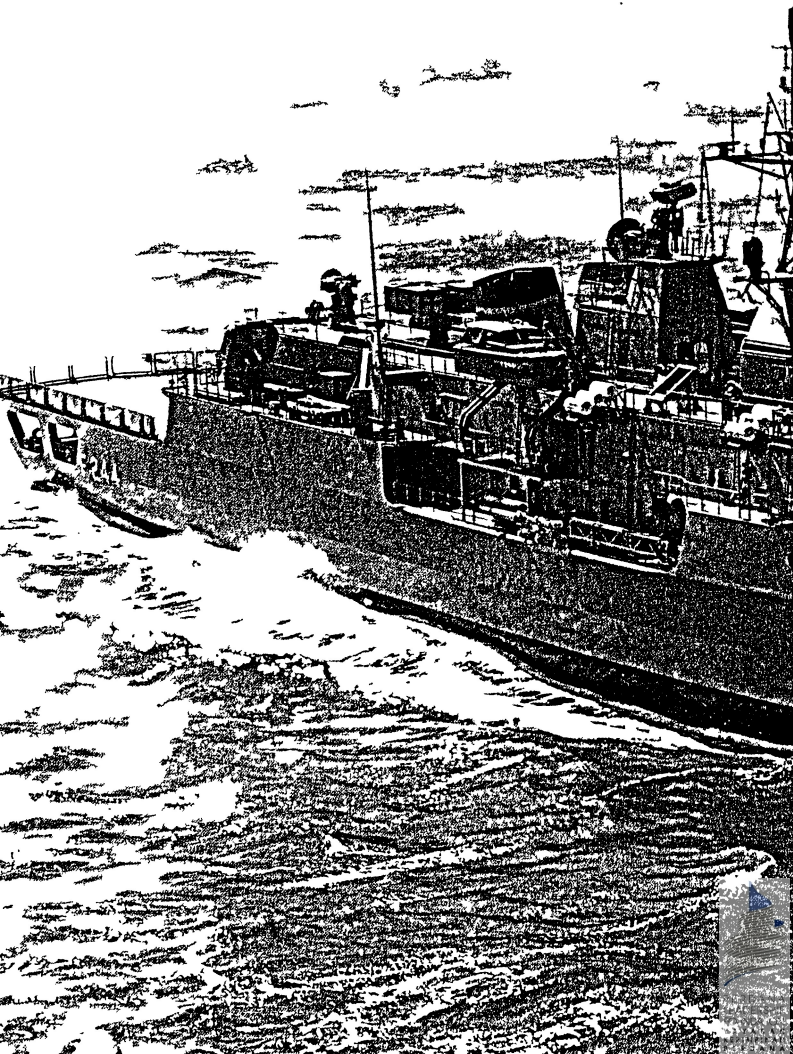
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# WARSHIPS

FROM 1860 TO THE PRESENT DAY

David Miller





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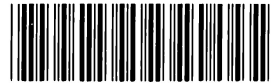
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# The Author

David Miller is a former officer in the British armed forces, who spent his service in England, the Falkland Islands, Germany, Malaysia, the Netherlands, Scotland, and Singapore. He subsequently worked as a freelance author and for three

years as a journalist for Jane's Information Group. He was Editor of the two-volume *Jane's Major Warships*, and has written more than forty other works, many of them related to sea warfare and naval weapons.

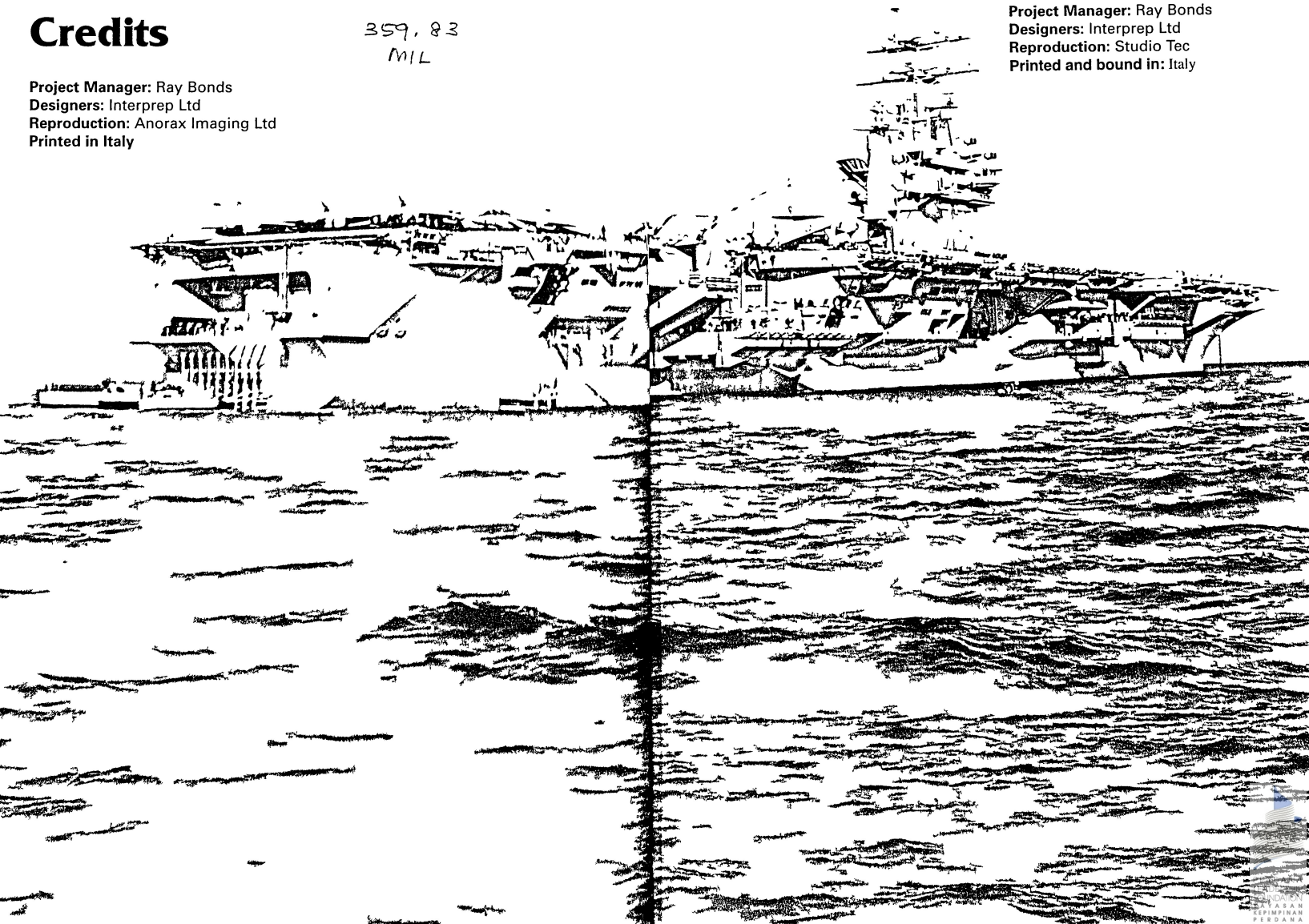
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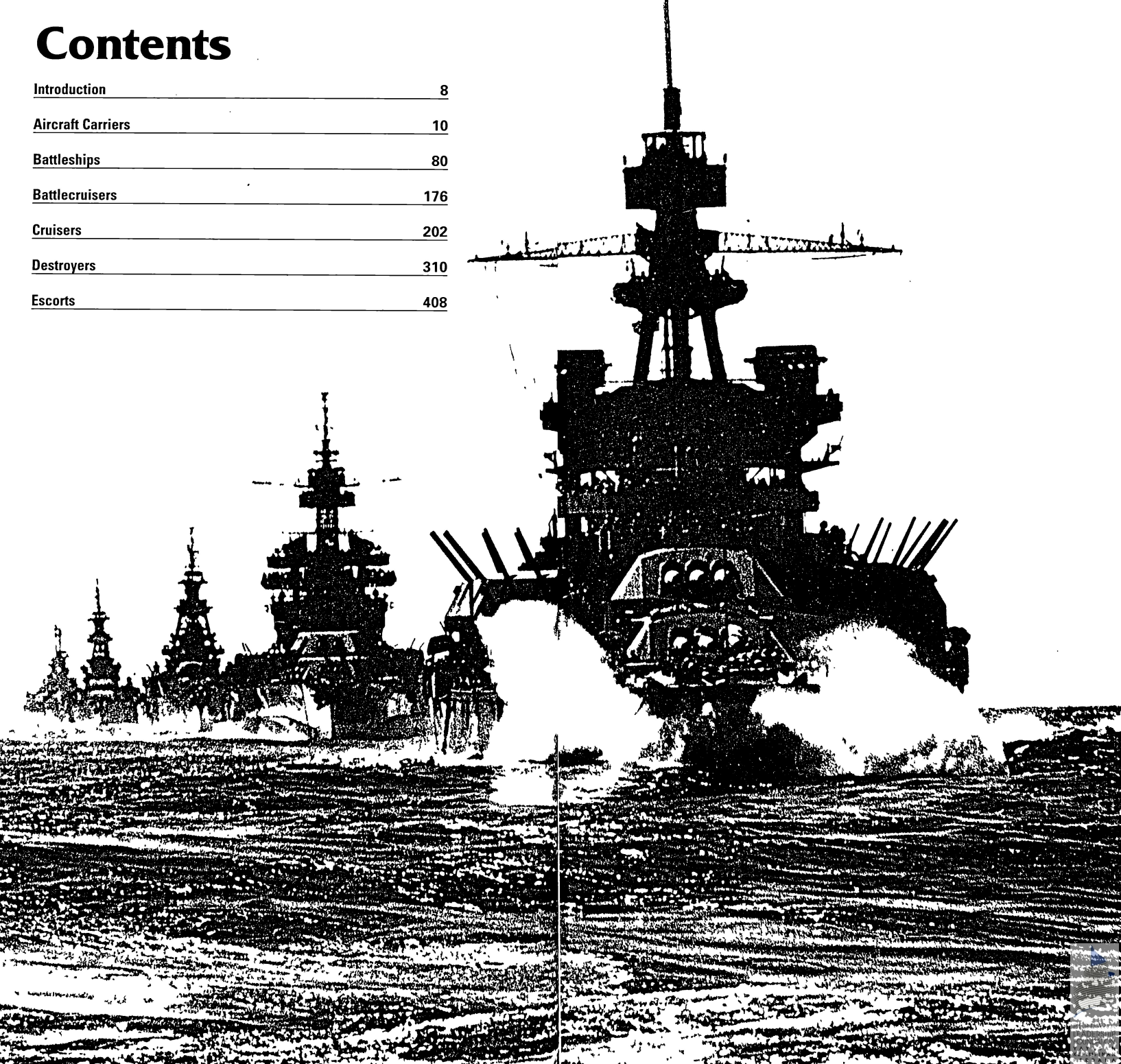
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# Introduction

Vast numbers of warships have been built between the advent of the ironclad in 1860 and the end of the 20th Century, and it would require many volumes to cover them all. This book seeks to select and describe the majority of the important classes, particularly those which had an influence on naval development, or were of special importance to a particular navy.

During the Victorian era by far the most important naval vessel was the battleship which was the standard measure of strategic power, its position being given even greater strength with the advent of the dreadnought in 1906. During World War I the dreadnought-type battleship was supreme, although their one great clash at the Battle of Jutland in 1916 proved inconclusive. Battleships then had a long twilight ending in the middle of World War II when the aircraft carrier became the most important vessel in the fleet. The carrier continued its dominance throughout the Cold War and retains it today, although such ships – and their associated air wings – are beyond the means of all but a few rich nations. Thus, most modern navies centre around smaller ships, such as destroyers and, since the 1950s, frigates.

A recurring theme in entries concerning the 1920s and 1930s is the effect of the various naval treaties, which need to be described briefly to enable their influence to be understood. The Washington Naval Conference (November 1921 - March 1922) involved France, Italy, Japan, UK and USA, the most significant agreement being that their fleet strengths should be fixed in the ratio: UK – 5, USA – 5, Japan – 3, France – 1.75, and Italy – 1.75. It was also agreed to ban construction of battleships and battlecruisers for ten years (but Britain was allowed to build *Nelson* and *Rodney*) after which ships more than twenty years old could be replaced on a one-for-one basis. Limits on displacement and gun calibre were also agreed: battleships/ battlecruisers – 35,000 tons, 16in (406mm) guns; cruisers – 10,000 tons, 8in (203mm) guns. Limits were based on displacement rather than ship numbers, so this was defined as the displacement of a ship equipped for war, plus ammunition, but less fuel and feed-water.

Individual aircraft carriers were limited to 33,000 tons and 8in (203mm) guns, while carrier tonnage was limited to: UK and USA – 135,000 tons, Japan – 81,000 tons; France, Italy – 60,000 tons. Like other capital ships, carriers could not be replaced until they were twenty years old. The signatory powers also banned increasing existing ships offensive capability, although 3,000 tons per ship could be added to improve their anti-aircraft/submarine defences.

The 1930 London Naval Conference had the same participants, although, following disagreements, France and Italy soon withdrew. This left Japan, UK and USA to agree to continue the ban on capital ship construction to 31 December 1936, and to reduce existing battlefleets to fifteen each for UK and USA and nine for Japan. The 5:5:3 ratio was also extended to heavy cruisers, and a new ratio of 10:10:7 was introduced to cover light cruisers and destroyers.

Japan announced in 1934 that it was withdrawing from the naval treaties and the 1935 conference, also in London, ended with France, the UK and the USA agreeing (25 March 1936) to limit capital ships to 35,000 tons, and cruisers and destroyers to 8,000 tons.

Germany was limited not by the Washington and London Agreements, but by the Versailles Treaty which had formally ended World War I and left the surface fleet with eight pre-dreadnoughts, eight light cruisers, sixteen destroyers and sixteen torpedo boats; no submarines, naval aviation or coastal defences were allowed and manpower was limited to 15,000. The result was, as the Allies intended, a toothless coastal-defence force, with thoroughly antiquated equipment and very limited manpower, although a

small amount of new construction was permitted. In 1935, however, the UK and Germany negotiated a separate bilateral arrangement (the Anglo-German Naval Agreement) under which Germany was permitted to built up to 35 per cent (by displacement) of the British Royal Navy in battleships, aircraft carriers, cruisers and destroyers, although they were allowed 45 per cent in submarines.

Reports of Japanese building in excess of 35,000 tons led to a revision (1938) of the treaty limits on the size of capital ships, and Hitler repudiated the Anglo-German agreement on 28 April 1939. With this the agreement structure totally collapsed.

Up to about the middle of World War II the British Royal Navy was by far the largest and most powerful in the world, setting the standards by which all others were measured. During the period 1900 to 1917 Imperial Germany attempted to challenge that dominance, but failed, while the US Navy was steadily building its strength until from about 1943 onwards it became the undisputed master of the world's oceans. Japan built a huge navy which attempted to challenge the US Navy for dominance of the Pacific in World War II, but it, too, failed totally. In the Cold War the Soviet Union built its navy at a remarkable pace and showed that it was not averse to trying new ideas, which resulted in some remarkable and greatly admired ships. In the end, however, it, too, over-reached itself and collapsed both suddenly and completely, an astonishing demise considering that it was not the result of defeat in battle, but due to political and financial problems.

## Entries

Entries, and in particular the specifications, are generally given for the first-of-class, as built.

**Ship types.** The names of ship types differ between navies and they have also changed over time. There have also been occasions when navies have deliberately placed ships in higher categories (ie, describing a destroyer as a cruiser) to deceive an enemy, or in a lower category (ie, describing a cruiser as a destroyer) to confuse their politicians. In this book ships are, with only a very few exceptions which are explained in the text, placed in the same category as that used by their own navy.

**Number in class.** This is the number of ships actually completed.

**Displacement.** Normally given as "standard" and "full load" unless specifically mentioned otherwise.

**Length.** Overall length of the ship but where this is not available, the figure is given as the length of the waterline (wl) or between perpendiculars (pp).

**Beam.** Width of the ship at its widest part.

**Draught.** Draught of the hull at full load (ie, excluding sonars).

**Armament.** "As built", in inches and then in metric down to 70mm, below which it is given in metric units only. The order of the data is: missile launchers, guns, AA weapons, ASW weapons.

**Armour.** Armour schemes were complicated and varied from one part of the ship to another. The figures given here show the normal maxima and minima of the main belt, which normally covered only the engines and magazines, and of other relevant areas.

**Complement.** This includes crew for any embarked aircraft, but excludes admiral and staff for flagships.

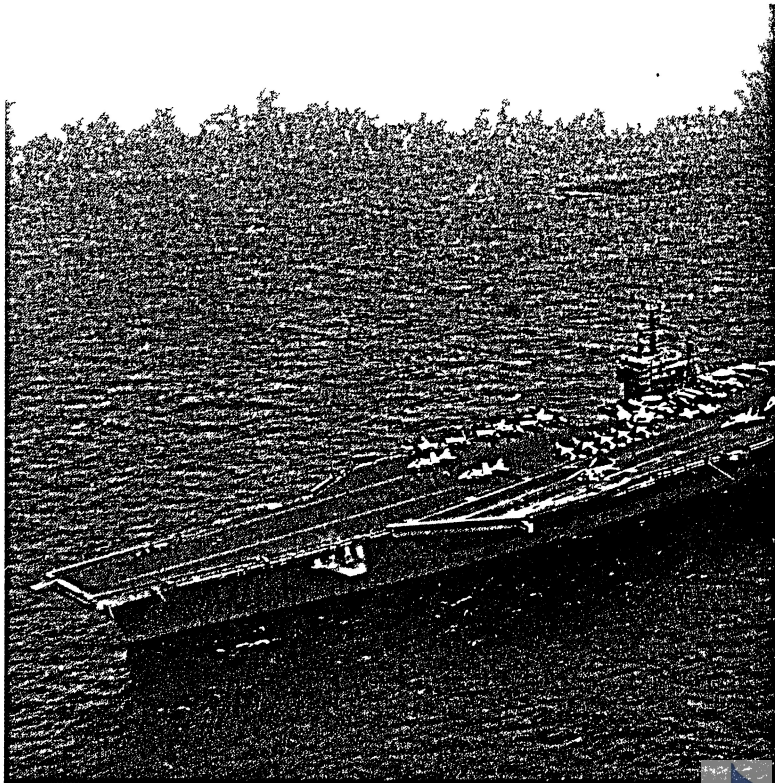
**Countries:** Where countries are listed this is done, in accordance with international practice, in the order of the first letter of their names in the English language, thus avoiding any indication of relative importance or author's preferences.

# Aircraft Carriers

Only a few years after the first appearance of aircraft, naval officers were devising methods of taking them to sea. Launching the aircraft was not the problem, since machines of the time had a very short take-off run and some planking laid along the top of a gun turret generally sufficed. The difficulty lay in the landings and it was eventually realised that a flat deck was the answer, although stopping the aircraft remained a problem for some years. Most of the problems had been solved by the late 1920s, however, and the British, Japanese and United States began to build "flat-top" carriers in large numbers. Progress gathered pace as new inventions made operations easier with the central lift, the cross-deck arrester wire, and the armoured flight deck.

In World War II carriers ousted battleships as the ultimate naval weapon. They became larger, carried more aircraft and operated in increasingly severe conditions. Such carriers played a major role in the Atlantic, but it was in the Pacific that they came into their own, with US and Japanese carrier aircraft fighting and deciding the outcome of battles without the main fleets actually coming within sight of each other.

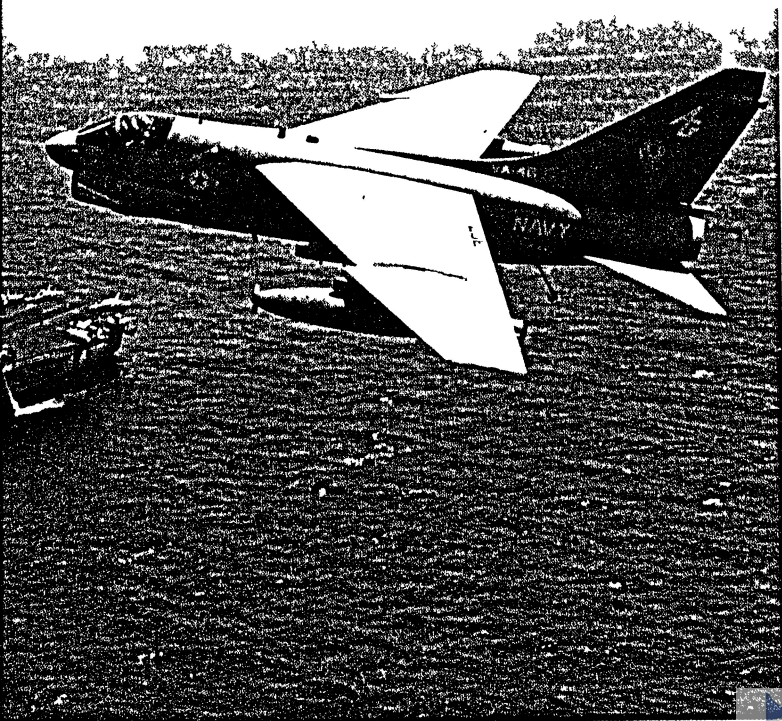
Post-war, carrier development gathered even greater momentum as the first generation of jet-propelled aircraft went to sea. But it needed inventions like the angled-deck, steam catapult and mirror landing-aid to enable them to



Above: Vought A-7E overflies nuclear-carrier USS *Dwight D Eisenhower* in 1988

operate the second and subsequent generations of jet aircraft. The US Navy continued to develop ever larger carriers until it virtually standardised on the nuclear-propelled Nimitz-class, which, with a displacement of 98,235 tons, is of a size no other warship can approach let alone equal. The Soviet Navy started from scratch and then developed a series of ships with a variety of layouts until, with the *Kuznetsov*, they reached a carrier which was very nearly on a par with the Americans, but then came the collapse of the Soviet Union and all was lost. Meanwhile, other navies concentrated on developing carriers of a more moderate and affordable size, most of them in the 10-20,000 ton bracket, which was made possible by the unique V/STOL AV-8B Harrier. The French have, however, recently completed a 40,000 ton carrier which will operate conventional aircraft, although at an enormous cost. The British are also returning to large size carriers with a project which will, it is hoped, culminate in a new 40,000 ton carrier in about 2010.

Each American supercarrier has an airwing that is more powerful and capable than all but a very few national air forces. Indeed they are so important that when a US president goes into the national operations centre to deal with an overseas crisis the first question that he asks is, "Where are the carriers?" It is a question a succession of presidents will continue to ask for many years to come.



# Béarn

FRANCE

**Completed:** May 1927.

**Number in class:** 1

**Displacement:** 22,146 tons standard; 28,400 tons full load.

**Dimensions:** Length 599.0ft (182.6m); beam 115.5ft (35.2m); draught 30.5ft (9.3m).

**Propulsion:** 2 shafts; 2 turbines; 6 boilers; 37,500shp; 21.5kt; 6,000nm at 10kt.

**Armour:** Main belt 3.2in (8cm), flight deck 1in (2.5cm).

**Aircraft:** 40.

**Armament:** 8 x 6.1in (155mm); 6 x 3in (76mm) AA; 8 x 37mm; 4 x 21in (533mm) TT.

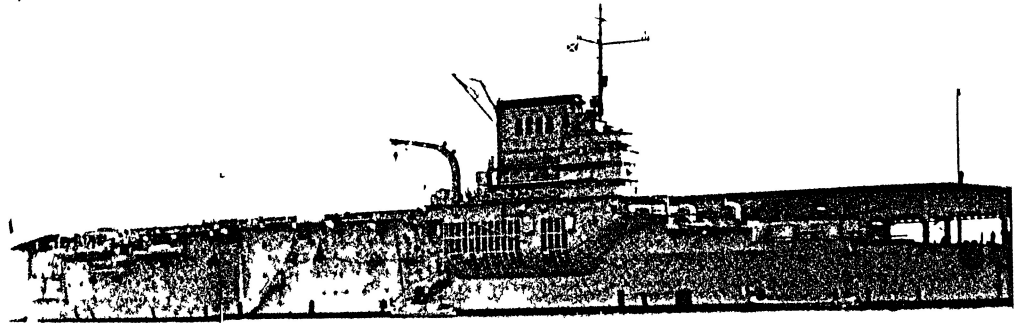
**Complement:** 875.

**History:** The design for French Navy's first aircraft carrier was prepared in 1922, when, as a result of the Washington Treaty, the incomplete hull of a Normandie-class battleship became available. Work started in late 1923 and the ship was completed in May 1927. *Béarn* was of conventional design with a 591ft (180m) flight deck, an open bow and a rounded-down after end. The normal aircraft wing comprised 40 aircraft, but due to limitations in flight-deck area, only about 10 of these could be ranged at any one time.

*Béarn* was completely refitted in 1935, but by the outbreak of war in 1939 her maximum speed of 21.5kt was too slow for service with the fleet. When France

fell in 1940 she was at Martinique, where she was de-militarised, but was returned to service as part of the Free French forces in June 1943. She was converted to an aircraft transport in the USA in 1944-45, which included installing an all-US weapons fit consisting of 4 x 5in (127mm), 24 x 40mm and 26 x 20mm. After the war *Béarn* served at Toulon for many years as an accommodation ship for submarine crews, but was sold for scrap in 1967.

*Below: Béarn, completed in 1927 was the first French-built aircraft carrier*



# Jeanne d'Arc

FRANCE

**Helicopter carrier/training ship**

**Completed:** June 1964.

**Number in class:** 1.

**Displacement:** 10,000 tons standard; 12,365 tons full load.

**Dimensions:** Length 597.0ft (182.0m); beam 79.0ft (24.0m); draught 24.0ft (7.3m).

**Propulsion:** 2 geared steam turbines; 4 boilers; 2 shafts; 26.5kt; 6,000nm at 15kt.

**Aircraft:** 4 x Super Frelon (8 in war).

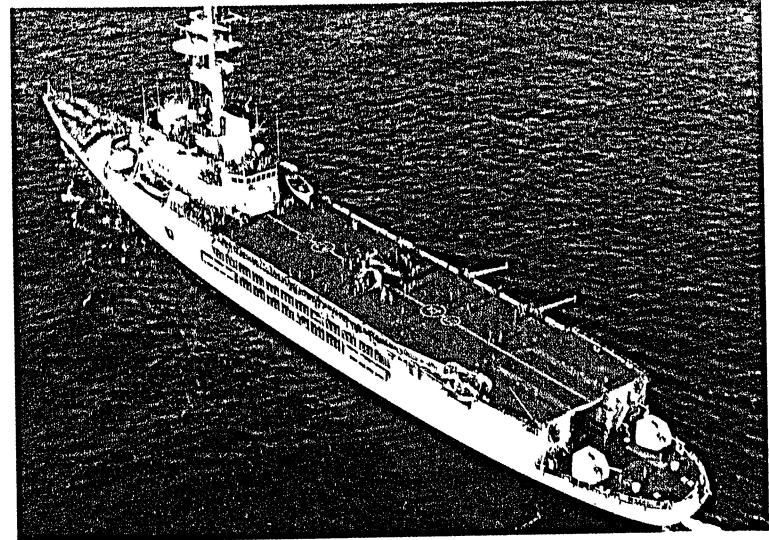
**Armament:** 4 x 100mm.

**Complement:** 627 (including 183 officer cadets).

**History:** The French Navy considered various proposals in the mid-1950s for a replacement for the training cruiser, *Jeanne d'Arc*, which had been in service since 1931. It was eventually decided to build a ship which could be used for training in peace but in wartime could be employed as a helicopter carrier for ASW duties, as an amphibious transport, or as a troop transport for a 700-strong infantry battalion. The hull design was based on that of the cruiser *Colbert*, but with less powerful machinery and a large flightdeck, measuring 203 x 69ft (62 x 21m), aft of the superstructure.

In peace the air wing comprises a maximum of four Super Frelon helicopters, which will be increased to eight in war by stripping out the accommodation normally used by the midshipmen trainees. In both peace and war the number of helicopters can be increased by operating smaller types such as Alouette or Lynx.

*Jeanne d'Arc* is normally employed as the flagship of the training squadron, undertaking a six-month cruise every year. It is a sound, sensible design,



*Above: Jeanne d'Arc, a training-ship in peace, was a helicopter carrier in war*

producing an excellent training ship, but which also has valuable potential for alternative uses in war. It was originally planned to replace *Jeanne d'Arc* by a new ship in 2003, but in 1998 this was postponed to 2006.

# Clemenceau

FRANCE

## Fleet carrier

**Completed:** 1961-63.

**Number in class:** 2.

**Displacement:** 22,000 tons standard; 32,780 tons full load.

**Dimensions:** length 870.0ft (265.0m); beam 168.0ft (51.2m); draught 28.0ft (8.6m).

**Propulsion:** 2 shafts; Parsons geared steam turbines; 6 boilers; 126,000shp, 32kt, 7,500rpm at 18kt.

**Armour:**

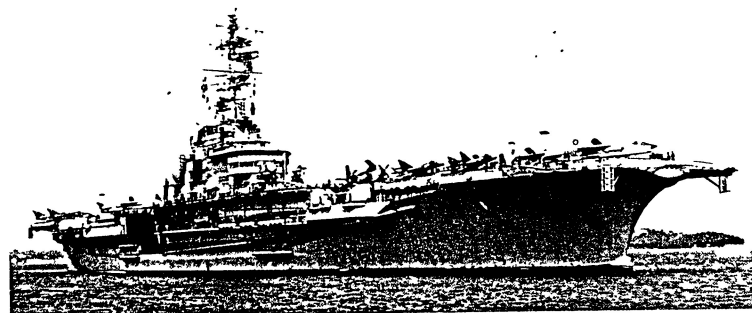
**Aircraft:** 40.

**Armament:** 8 x 100mm.

**Complement:** Aircraft carrier = 1,338; helicopter carrier = 984.

**History:** In the early post-war years the French Navy operated three carriers: an ex-British ship, *Arromanches* (1946-74), and two US carriers on loan, *Lafayette* (1950-63) and *Bois Belleau* (1953-60). These were replaced by these two all-French carriers, which entered service in 1961 (*Clemenceau*) and 1963 (*Foch*). These were very capable ships for their size, and incorporated all the carrier developments of the 1950s, including a fully angled deck, mirror landing-sight, steam catapults and two 15 tons capacity (later increased to 20 tons) lifts.

The air group was originally planned to be 60 aircraft, but the increase in size and weight of carrier-borne aircraft in the 1950s and 60s reduced this to 40. As originally commissioned, the air group comprised two flights of Etendard IVM sea/land-attack fighters, a small number of Etendard IVP recce/tanker aircraft, with air-defence provided by Aquilons (licence-built de Havilland Sea



**Above:** *Clemenceau*; Crusader, Etendard fighters, and Alizé ASW aircraft on deck

Venom) and ASW by Alizé turboprop aircraft. F-8E Crusaders took over the air defence role in 1963, and Super Etendard replaced the Etendard IVM in the late 1970s, while helicopters took on the ASW and planeguard duties.

The two ships remained in service much longer than expected and from the mid-1970s they alternated, with one in service as a fixed-wing carrier, while the other was either in refit or in service as a helicopter carrier with a reduced crew. *Clemenceau* left service in 1997 and was then used as a source of spares to keep *Foch* going. It was planned at one time that *Foch* would remain in service until about 2006, operating Rafale M in place of Crusaders, but that was later changed and she was decommissioned in mid-2000 and sold to Brazil.

# Charles De Gaulle

FRANCE

**Completed:** 1999.

**Number in class:** 1 (1 more to be ordered).

**Displacement:** 37,520 tons standard; 40,600 tons full load.

**Dimensions:** Length 858.0ft (261.5m); beam 211.0ft (64.4m); draught 28.0ft (8.5m).

**Propulsion:** Two shafts; 2 150megawatt K15 pressurised-water nuclear reactors; 2 double-reduction geared steam turbines; 82,000shp; 27kt.

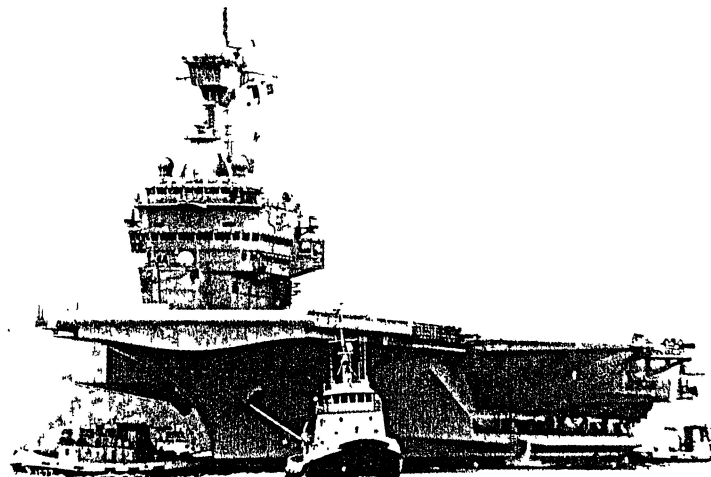
**Aircraft:** 35-40.

**Armament:** 2 x Sylver vertical-launch SAAM groups(16 x 2); 32 x Aster-15 missiles), 2 x Sadral . SAM; 8 x 20mm AA.

**Complement:** 1,950.

**History:** After many years under development and construction France's nuclear carrier (CVN) entered service in 2000. The hull dimensions are virtually identical to those of the Clemenceau-class, a limit imposed by the size of the building dock at Brest, but the flight deck is much larger and is served by two 36 ton-capacity deck-edge lifts, enabling much heavier aircraft to be operated. There are two catapults, one on the forward deck, the other on the angled deck, each capable of accelerating a 22 ton aircraft to a speed of 140kt.

The nuclear propulsion system is based on that used in Le Triomphant-class SSBNs and gives a virtually unlimited range, although this does not remove the need for regular replenishment of aviation fuel, ammunition, food and stores. The total power available is such that the maximum possible speed is 27kt, somewhat slow by modern standards. One of the many innovations is the SATRAP computer-controlled stability system in which a heavy trolley moves across the ship to compensate for rolls, enabling aircraft to be launched and recovered in high sea states.



**Above:** France's nuclear-carrier, *Charles de Gaulle*, finally entered service in 2001

The air group comprises some 35-40 aircraft: two flights of Rafale M strike fighters, one flight of two E-2C Hawkeye AEW aircraft, and a flight of helicopters.

The final cost of this programme is estimated to be well over \$US3billion and there has been lengthy discussion about whether, or not, to build a second carrier. That decision has been postponed to 2003, at the earliest.

# Andrea Doria

ITALY

## Helicopter cruiser

**Completed:** 1964.

**Number in class:** 2.

**Displacement:** 5,000 tons standard; 6,500 tons full load.

**Dimensions:** Length 489.8ft (149.3m); beam 56.4ft (17.3m); draught 16.4ft (5.0m).

**Propulsion:** Two shafts; geared turbines; 4 boilers; 60,000shp; 30kt; 5,000nm at 7kt.

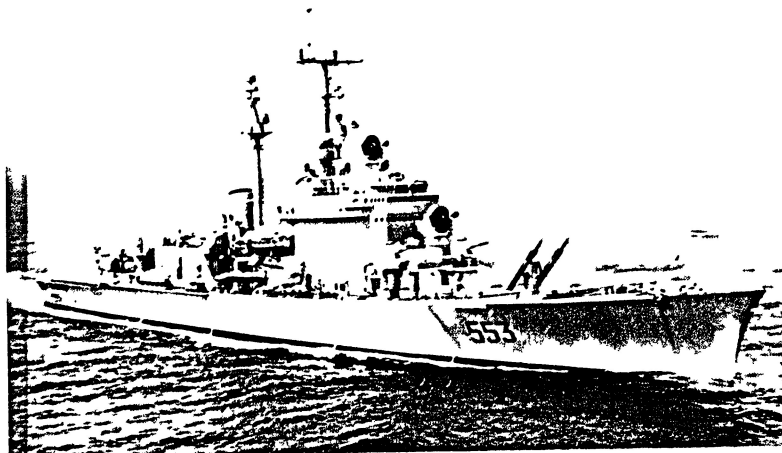
**Aircraft:** 4 helicopters.

**Armament:** 1 x Terrier twin-arm SAM launcher (40 missiles), 8 x 76mm, 6 x 324mm TT.

**Complement:** 485.

**History:** These two ships, *Andrea Doria* and *Caio Duilio*, were ordered in 1957-58 and completed in 1964, and followed one of the naval fashions of the period by combining the forward elements of a cruiser with a large flight deck aft. They were essentially an enlarged version of the Impavido-class destroyer design, but with a hangar built into the after end of the superstructure and a large flight deck, which measured 98.5 x 52.5ft (30 x 16m). It was originally intended to operate Sea King helicopters, but in practice it was found that the air facilities were too small for such large aircraft and the normal air group consisted of four Agusta-Bell AB-212 ASW helicopters.

The main weapon system was a twin-armed Terrier launcher on the foredeck, which, in *Doria* alone, was replaced by the Standard SM1(ER) missile system in the mid-1970s. They also mounted eight of the then new OTO



Above: Italy's *Andrea Doria*, an air-capable cruiser with a large flightdeck aft

Melara 76mm guns for close-in air defence.

Both ships were regularly refitted during their lives, but only one, *Doria*, was given a full modernisation between 1976 and 1978, while *Duilio* was converted into a training ship, instead. Both gave many years of service, *Doria* being stricken in 1991 and *Duilio* in 1992.

# Vittorio Veneto

ITALY

## Helicopter cruiser

**Completed:** 1969.

**Number in class:** 1.

**Displacement:** 7,500 tons standard; 8,850 tons full load.

**Dimensions:** Length 589.3ft (179.6m); beam 65.6ft (19.4m); draught 19.8 ft (6.0m).

**Propulsion:** Two shafts; geared steam turbines; 4 boilers; 73,000shp; 30.5kt; 5,000nm at 17kt.

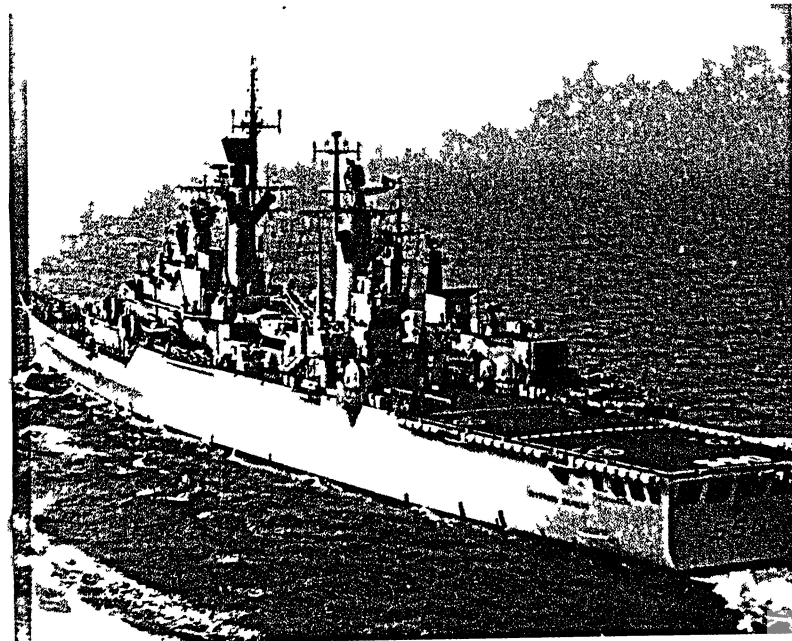
**Aircraft:** 6 x SH-3D or 9 x AB-212.

**Armament:** 1 x Terrier twin-arm launcher (60 missiles), 8 x 76mm, 6 x 21in (533mm) TT.

**Complement:** 550.

**History:** Following early experience with *Andrea Doria* the Italian Navy decided that instead of a third ship of the same design there would be considerable benefits from building a somewhat larger ship. Thus, the *Vittorio Veneto* has a much larger hull, resulting in a flight deck measuring 60.6 x 13.3ft (18.5 x 4.0m) with a larger hangar which is underneath the flight deck rather than in the after end of the superstructure. This enables a much larger air group to be operated, consisting of six SH-3D Sea King or nine AB-212. The deeper hull forward also enabled the missile capacity to be increased from 40 to 60, and *Vittorio Veneto* is able to launch both Terrier SAMs and ASROC ASW missiles.

*Vittorio Veneto* served as fleet flagship until replaced by *Garibaldi* in 1985. She then took over the training ship role from *Caio Duilio* and was due to have been phased out of service in 2000, but this was later extended to at least 2005.



Above: *Vittorio Veneto*, showing her flightdeck; a frigate is on her starboard side

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