Silver Jubilee Fleet Review

OFFICIAL SOUVENIR PROGRAMME

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Foreword *by His Royal Highness The Prince of Wales KG*

This review of the Fleet by Her Majesty The Queen represents the continuation of a great tradition of naval reviews carried out by previous British Sovereigns, their purpose invariably being to display the composition of the fleet (or fleets) in existence at the time.

A review also offers a chance to the Royal Navy to parade, as it were, in front of its Lord High Admiral, something which tends to happen rather rarely—by the very nature of its operational requirements and the element in which it moves.

My family have always had a long, close and proud association with the Royal Navy: a service which, for my forbears, my more immediate relations and latterly myself, has proved to be a rich source of human experience, of education, and the development of a sense of duty. My own personal association has been particularly close—after all, there cannot be many who can claim the distinction of both parents as Admirals.

I am, therefore, extremely proud to have been asked to write the foreword to this Programme, although I cannot help admitting that following the precedent of my great-grandfather King George V, who commanded Torpedo Boat 79 at a Naval Review in 1889 (as a young Lieutenant), I would have preferred to take part in this review myself in command of a certain minehunter.

When The Queen reviews her ships today she will be reviewing, in human terms, the continuation of that great maritime spirit which has proved to be the strength and saving grace of this island on so many previous occasions and which is still the envy of so many navies throughout the world.

Charles

Introduction *by Admiral Sir Henry Leach KCB*
Commander-in-Chief Fleet

Welcome to Her Majesty's Review of the Royal Navy. Like her Father and Grandfather before her, The Queen has always maintained the closest touch with her Fleet. We are proud that Her Majesty is Lord High Admiral of the United Kingdom and that she is so ably supported by Their Royal Highnesses The Duke of Edinburgh and The Prince of Wales, both of whom have held operational command at sea.

The last quarter of a century has seen much change in the Navy. The ships are different—today's Battleships are the nuclear-powered Fleet submarines; Frigates now pack a more powerful punch than pre-war Light Cruisers; the capability of the Fleet Air Arm's front-line Aircraft and the skills required to operate them bear no comparison with those of 25 years ago; every ship larger than a Coastal Minesweeper carries its own Helicopter; and all our essential replenishment of food, fuel, ammunition and stores is carried out underway at sea from the Royal Fleet Auxiliaries.

The equipment is different:—Steam is giving way to Gas-Turbine Propulsion; Action Information from a ship's many sensors is processed increasingly by Computers (still controlled and maintained by men); Guns are being replaced by Guided Missiles.

The whole pattern of operating the Navy is different—there is a single, large Fleet which is mainly concentrated in the Channel and Eastern Atlantic areas in support of NATO, although world wide deployments of groups of ships continue to be made; the importance of offshore waters with their rich holdings of gas, oil and fish has grown immensely as has that of the ships and aircraft which patrol them; the amount of sea time for all ships is much greater; exercises are more realistic, more frequent and more exacting.

The Officers and Men are as cheerful and dedicated as their predecessors of 25 years ago, but today they have to be masters of the tremendous advances in technology and to have impressive skills ranging over a wide field in which leadership and professionalism continue to predominate.

With its Polaris Submarines the Navy operates the national strategic nuclear deterrent. You will not see one at the Review: they are at sea on patrol, making their vital contribution to the task of preventing war.

Present, too, are ships from other countries in the Commonwealth, the North Atlantic Alliance, the European Economic Community and the Central Treaty Organisation.

Nearly three-quarters of the earth's surface is covered by water. On, over and under these seas pass most of our country's vital interests: food, fuel, trade. We are an island nation dependent on the sea and the historic words 'It is on the Navy under the good providence of God that our wealth, prosperity and peace chiefly depend' apply with as much force today as when Sir Walter Raleigh spoke them in the reign of Queen Elizabeth I.

I wish you and your families a happy time amongst your Fleet and your Sailors helping to celebrate Her Majesty's Silver Jubilee.

HLeach

ADMIRAL

Programme of The Silver Jubilee Fleet Review

Friday 24 June

HM Ships assemble at Spithead

0800 The flag of the Commander-in-Chief Fleet (Admiral Sir Henry Leach, KCB) is hoisted in HMS *Ark Royal*

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Saturday 25 June

Commonwealth and Foreign ships assemble

1100 Fly Past rehearsal by aircraft of the Fleet Air Arm

2200-2359 Fleet illuminated

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Sunday 26 June

1030 Silver Jubilee Thanksgiving Service in HMS *Ark Royal*

1830 Reception given by Commander-in-Chief Fleet for Commonwealth and Foreign Officers in HMS *Ark Royal*

2200-2359 Fleet illuminated

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Monday 27 June

0800 Ships in the Review Lines dress overall

1000 Rehearsal Column proceeds to Spithead. Column consists of Royal Fleet Auxiliary *Engadine* (representing HMY *Britannia*) preceded by Trinity House Vessel *Winston Churchill* and followed by HMS *Birmingham*

1019 Rehearsal of gun salute (first and last guns only)

1030 Rehearsal Column anchors

1300 Review area closed. Warning guns fired by HMS *Tiger* and HMS *Apollo*

1325 Rehearsal Column weighs anchor

1330 Rehearsal Column enters Review Lines with RFA *Engadine* preceded by THV *Winston Churchill* and followed by HMS *Birmingham*

Early pm RMS *Queen Elizabeth 2* will pass through the Main Shipping Channel outward bound.

1530 Rehearsal Column anchors

1600 Review area open. Guns fired by HMS *Tiger* and HMS *Apollo*

1700 Rehearsal Column weighs anchor and enters harbour

1740 Her Majesty The Queen arrives at Portsmouth Harbour Station and is received by the Lord Lieutenant of Hampshire (The Right Honourable The Earl of Malmesbury, TD), the Lord Mayor of Portsmouth (Councillor George Austin) and the Commander-in-Chief Naval Home Command (Admiral Sir David Williams, KCB, ADC)

1755 Her Majesty The Queen arrives at South Railway Jetty and is received by the Commander-in-Chief Fleet and the Flag Officer Portsmouth (Rear Admiral W. J. Graham)

Royal Standard broken in HMY *Britannia*. Royal salute fired by Naval Saluting Battery

2200-2359 Fleet illuminated

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Tuesday 28 June

0800 Ships in the Review Lines dress overall

1100 HMY *Britannia* with Her Majesty The Queen and members of the Royal Family embarked, preceded by THV *Patricia* (Elder Brethren of Trinity House embarked) and followed by HMS *Birmingham* (Admiralty Board embarked) and RFA *Engadine* (Press embarked), leaves South Railway Jetty for Spithead

1107 Royal Salute by Guards and Bands paraded in HMS *Vernon* and HMS *Dolphin* as HMY *Britannia* passes

1115 RFA's *Lyness*, *Sir Geraint* and *Sir Tristram* sail from Southampton with Official Guests

1119 Royal Salute fired by HM Ships *Ark Royal*, *Hermes*, *Fearless*, *Tiger*, *Glamorgan*, *Fife*, *Kent* and selected Commonwealth and Foreign ships as HMY *Britannia* passes Spit Refuge buoy

1130 HMY *Britannia* anchors at the head of the Review Lines

1230 The Admiralty Board and Flag Officers of the Fleet attend luncheon with Her Majesty The Queen in HMY *Britannia*

1330 Review area closed. Warning guns fired by HMS *Tiger* and HMS *Apollo*

1425 HMY *Britannia* weighs anchor

1430 Her Majesty The Queen reviews the Fleet. HMY *Britannia*, preceded by THV *Patricia* and followed by HMS *Birmingham* and RFA's *Lyness*, *Sir Geraint*, *Sir Tristram* and *Engadine*, enters the Review Lines

1630 HMY *Britannia*, HMS *Birmingham* and THV *Patricia* anchor at the head of the Review Lines

1645 Fly Past by aircraft of the Fleet Air Arm led by the Flag Officer Naval Air Command (Rear Admiral J. O. Roberts, CB)

1700 Review area open. Guns fired by HMS *Tiger* and HMS *Apollo*

1700 RFA's *Lyness*, *Sir Geraint* and *Sir Tristram* return to Southampton

1735 Reception in HMY *Britannia* for Naval Ratings of the Fleet

1840 RFA's *Lyness*, *Sir Geraint* and *Sir Tristram* berth at Ocean Terminal Southampton

1845 Displays by Royal Navy personnel in Southsea Common arena

2015 Her Majesty The Queen, accompanied by His Royal Highness The Duke of Edinburgh and other members of the Royal Family, dines on board HMS *Ark Royal*

2100 Beat Retreat by Royal Marines on Southsea Common

2205 Firework display on Southsea Common by City of Portsmouth sponsored by Schroder Life Group

2230 Fleet illuminated

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Wednesday 29 June

0230 Switch off Fleet Illumination

0800 Ships in the Review Lines dress overall

0815 HMY *Britannia* weighs and returns to Portsmouth Harbour

0935 Royal Salute fired by the Fleet as HMY *Britannia* passes Outer Spit Buoy

0947 Royal Salute by Guards and Bands paraded in HMS *Dolphin* and HMS *Vernon* as HMY *Britannia* enters harbour.

1000 HM Ships weigh and proceed

1005 HMY *Britannia* berths at South Railway Jetty

1045 Her Majesty The Queen starts her visit to the City of Portsmouth. Royal Standard struck in HMY *Britannia*

pm Commonwealth and Foreign ships disperse

Ships and Naval Aircraft Taking Part

HM SHIPS

SHIP	PENNANT NO.	COMMANDING OFFICER
HMY *Britannia*	A00	Rear-Admiral H. P. Janion

AIRCRAFT CARRIERS AND AMPHIBIOUS SHIPS

HMS *Ark Royal*	R09	Capt B. R. Anson
(Flagship of Admiral Sir Henry Leach KCB, Commander-in-Chief Fleet)		
HMS *Hermes*	R12	Capt R. G. A. Finch
(Flagship of Rear-Admiral W. D. M. Staveley, Flag Officer, Carriers and Amphibious Ships)		
HMS *Fearless*	L10	Capt L. A. Bird MVO

FIRST FLOTILLA

HMS *London*	D16	Capt P. D. Nicholl
(Flagship of Rear-Admiral K. R. Squires, Flag Officer, First Flotilla)		
HMS *Antrim*	D18	Capt R. M. Burgoyne
HMS *Blake*	C99	Capt H. B. Parker
HMS *Devonshire*	D02	Capt C. A. F. Buchanan

First Frigate Squadron

HMS *Galatea*	F18	Capt D. B. Nelson
(Captain First Frigate Squadron)		
HMS *Phoebe*	F42	Capt H. M. Balfour
HMS *Alacrity*	F174	Cdr R. B. Mortlock
HMS *Target*	F133	Cdr M. A. C. Moore
HMS *Gurkha*	F122	Cdr D. H. Barraclough
HMS *Salisbury*	F32	Cdr J. T. Sanders

Second Frigate Squadron

HMS *Apollo*	F70	Capt G. M. F. Vallings
(Captain Second Frigate Squadron)		
HMS *Hardy*	F54	Lt Cdr M. J. Lamont
HMS *Dagger*	F43	Lt Cdr M. H. Rhodes
HMS *Dundas*	F38	Lt Cdr W. J. Christie

Fifth Frigate Squadron

HMS *Glamorgan*	F58	Capt J. A. B. Thomas
(Captain Fifth Frigate Squadron)		
HMS *Birmingham*	D86	Capt P. J. Symons
HMS *Nubian*	F131	Cdr J. R. Griffiths

Sixth Frigate Squadron

HMS *Andromeda*	F57	Capt K. A. Love
(Captain Sixth Frigate Squadron)		
HMS *Naiad*	F39	Capt R. C. Ditmarsh
HMS *Brighton*	F102	Cdr P. Bell
HMS *Charybdis*	F75	Cdr P. J. King

SECOND FLOTILLA

HMS *Tiger*	C20	Capt S. A. C. Caruth CBE
(Flagship of Rear-Admiral M. L. T. Wemyss, Flag Officer Second Flotilla)		
HMS *Glamorgan*	D19	Capt B. K. Shattock ADC
HMS *Fife*	D20	Capt G. C. Lloyd
HMS *Kent*	D12	Capt J. C. K. Slater MVO

Third Frigate Squadron

HMS *Diomede*	F16	Capt A. F. C. Wemyss OBE
(Captain Third Frigate Squadron)		
HMS *Sheffield*	D80	Capt J. F. Woodward
HMS *Arrow*	F173	Cdr N. J. Barker
HMS *Avenger*	F98	Cdr J. K. Coulet

Fourth Frigate Squadron

HMS *Glasgow*	F28	Capt J. M. Webster
(Captain Fourth Frigate Squadron)		
HMS *Zulu*	F124	Cdr M. J. M. Wilkin MBE
HMS *Amazon*	F169	Cdr A. B. Richardson

Seventh Frigate Squadron

HMS *Jupiter*	F60	Capt D. G. Armytage
(Captain Seventh Frigate Squadron)		
HMS *Ariadne*	F72	Capt T. M. Bevan
HMS *Antelope*	F170	Cdr B. W. Turner
HMS *Danae*	F47	Cdr J. S. Ainger
HMS *Euryalus*	F15	Cdr J. C. W. Lock

Eighth Frigate Squadron

HMS *Scylla*	F71	Capt G. W. Loydon
(Captain F. Cobb, Captain Eighth Frigate Squadron)		
HMS *Berwick*	F115	Cdr W. W. F. Chatterton-Dickson
HMS *Plymouth*	F126	Cdr K. H. Day OBE
HMS *Rothesay*	F107	Cdr N. C. H. Jones

SUBMARINE FLOTILLA

HMS *Superb*	S109	Cdr D. J. Ramsay
(Flagship of Rear-Admiral J. D. F. Fieldhouse, Flag Officer Submarines)		
HMS *Valiant*	S102	Cdr B. S. J. Larken
(Captain R. G. Henslip, Captain S/M Second Submarine Squadron)		
HMS *Churchill*	S104	Cdr R. F. Channon
(Captain P. F. Grenier, Captain S/M Third Submarine Squadron)		
HMS *Dreadnought*	S101	Cdr H. K. P. Mitchell
HMS *Oracle*	S16	Lt Cdr R. F. Strange
(Captain C. E. T. Baker MBE, Captain S/M First Submarine Squadron)		
HMS *Conqueror*	S06	Lt Cdr N. J. K. Crews
HMS *Walrus*	S09	Lt Cdr M. G. Jones
HMS *Sealion*	S07	Lt Cdr J. K. Boyle
HMS *Osiris*	S11	Lt Cdr P. Higgins
HMS *Orpheus*	S11	Lt Cdr I. B. Taylor
HMS *Opossum*	S14	Lt Cdr C. L. Wreford-Brown
HMS *Onslow*	S17	Lt Cdr P. Branscombe
HMS *Onyx*	S20	Lt J. F. Perowne
HMS *Otus*	S18	Lt N. D. V. Robertson

MINE COUNTERMEASURES VESSELS

Fishery Protection Squadron

HMS *Cuxton*	M1125	Lt Cdr J. J. M. Davies-Webb
(Captain P. G. V. Dingemans, Captain Fishery Protection)		
HMS *Brinton*	M1114	Lt A. B. Ross
HMS *Alfriston*	M1107	Lt J. N. Martin
HMS *Shavington*	M1160	Lt R. J. Lappier

Second MCM Squadron

HMS *Brinkburn*	M1153	Lt Cdr L. K. Lindsay
(Captain D. F. Watts, Captain Mine Countermeasures)		
HMS *Wilton*	M1118	Lt Cdr J. H. S. Hulke
(Commander R. S. Seenlake, Senior Officer Second Mine Countermeasures Squadron)		
HMS *Fittleton*	M1151	Lt D. F. C. Russell
HMS *Nurton*	M1156	Lt M. O. Macintyre

First MCM Squadron

HMS *Gavinton*	M1140	Lt Cdr R. H. Kerr
(Commander R. A. Smith, Senior Officer First Mine Countermeasures Squadron)		
HMS *Alkerton*	M1165	Lt J. A. Rimington
HMS *Bildeston*	M1110	Lt P. L. Corneth

Third MCM Squadron

HMS *Sheraton*	M1162	Lt Cdr M. Goodman
(Senior Officer, Third Mine Countermeasures Squadron)		
HMS *Glenarton*	M1141	Lt Cdr R. W. Andrew

Fast Training Boats

HMS *Cutlass*	P274	Lt Cdr J. R. Jamieson
(Senior Officer First Fast Training Boat Squadron (FTBS))		
HMS *Scimitar*	P271	Lt A. M. Willmett
HMS *Sabre*	P275	Lt D. A. Lewis

Tenth MCM Squadron (Royal Naval Reserve)

HMS *Kellington*	M1154	Lt J. G. F. Stoy, RNR
(Commodore B. K. Perrin, VRD, RNR Commodore Ltr 3 RNR)		
HMS *Crofton*	M1116	Cdr G. R. Hill, RD, RNR
(Senior Officer, Tenth Mine Countermeasures Squadron)		
HMS *Kedleston*	M1155	Lt Cdr J. D. Pierce, RD, RNR
HMS *Hubberston*	M1148	Lt Cdr R. B. M. Fawcett, RD, RNR
HMS *Wilton*	M1205	Lt Cdr D. Greenow, RNR
HMS *Patrol*	P262	Lt Cdr T. R. J. Shanks, RD, RNR
HMS *Upton*	M1167	Lt P. W. James, RNR

SURVEY SHIPS

SHIP	PENNANT NO.	COMMANDING OFFICER
HMS *Herald*	A138	Cdr C. E. K. Robinson
(Flagship of Rear-Admiral D. W. Haslam OBE, Hydrographer of the Navy)		
HMS *Hecla*	A133	Cdr R. O. Morris
HMS *Hecate*	A137	Cdr G. L. Hope
HMS *Beagle*	A319	Cdr R. E. Heaney
HMS *Fawn*	A355	Cdr J. F. Shorthouse
HMS *Echo*	A70	Lt Cdr P. J. L. Kelly
(Senior Officer Inshore Survey Squadron)		
HMS *Enterprise*	A71	Lt Cdr D. F. Russell
HMS *Bulldog*	A317	Lt Cdr C. S. Gobey
HMS *Fox*	A320	Lt Cdr R. L. Barbferth
HMS *Egeria*	A72	Lt Cdr C. F. Heron-Watson
HMS *Woodlark*	M2780	Lt Cdr W. A. Nicholson

MISCELLANEOUS UNITS

Naval Hovercraft Trials Unit: Cdr N. T. Bennett AFC

HMS *Lynx*	F27	Lt Cdr G. A. Cole MBE
HMS *Ish*	M2010	Lt Cdr A. Pearson
HMS *Eastbourne*	F73	Lt Cdr C. K. D. Cobley
HMS *Reclaim*	A231	Lt Cdr K. D. Kempsell *GM*
HMS *Fittleton*	M2628	Lt Cdr R. J. Pike
HMS *Dottington*	M2621	Lt M. Bennett
HMS *Laleham*	M1158	Lt Cdr D. A. Bartlett

SHIPS OTHER THAN WARSHIPS

Royal Fleet Auxiliaries

RFA *Gold Rover*—Commodore S. C. Dunlop MBE
RFA *Lyness*—Capt S. E. Clench
RFA *Tidespring*—Capt P. J. McCarthy
RFA *Olwen*—Capt A. Proudlock
RFA *Sugadene*—Capt C. G. Butterworth
RFA *Stromness*—Capt A. W. Stanley
RFA *Sir Geraint*—Capt D. A. Reynolds
RFA *Sir Tristram*—Capt M. W. Salt
RFA *Pearleaf*—Capt C. A. P. Wydenbruck

Royal Maritime Auxiliary Service

RMAS *Newton*—Capt A. E. Greiner RMAS
RMAS *Reysterer*—Capt R. F. Dunkley RMAS
RMAS *Goosander*—Capt A. McGregor RMAS
RMAS *Watermitch*—Lieut Cdr I. T. K. Pauley RN (Rtd)

Royal Naval Auxiliary Service

XSV *Portisham*—SNXO P. Newell
XSV *Shipham*—SNXO K. J. Steandon
XSV *Loyal Proctor*—SNXO I. Macdonald
XSV *Portesham*—CNX D. Thomas
XSV *Tongham*—PNXO R. Paterson
XSV *Loyal Moderator*—SNXO H. R. Moyle
XSV *Pagham*—CNX D. F. Edmunson
XSV *Thakeham*—CNX J. Spall
XSV *Loyal Chancellor*—CNX D. W. Bulloch

Royal Corps of Transport

HMAV *Audemer*—Capt P. J. Robyns RCT

Corporation of Trinity House

THV *Patricia*—Cdr P. Inman THS
(Flagship of The Elder Brethren of Trinity House, Deputy Master Captain M. B. Wingate THS)
THV *Winston Churchill*—Cdr G. Roberts THS

Commissioners of Northern Lighthouse Board

MV *Pharos*—Capt S. K. Davidson

Commissioners of Irish Lights

ILV *Granuaile*—Capt G. Kinsella

HM Customs and Excise

HMRC *Venturous*—R. G. Bayly

HM Coastguard

MV *Miranda*—Cdr D. Y. Roberts RN (Retd)

Royal National Life-boat Institution

RNLB *City of Bristol*—Clovelly—T. Nutman
RNLB *Joy and John Wade*—Yarmouth IOW—Capt R. Harding
RNLB *Charles Henry*—Selsey—Lieut Cdr A. M. Woodruffe RNR

General Council of British Shipping

SS *British Respect* (BP)—Commodore A. Davies
SS *Opalia* (Shell Tankers (UK) Ltd)—Capt S. F. Darroch RD RNR (Commodore, Shell Tankers)
MS *Manapouri* (P & O Steam Navigation Company)—Captain R. F. Lowther
MS *Fernley* (Stephenson Clarke Shipping Ltd)—Capt J. M. Johnson
MS *Singularity* (F. T. Everard and Sons Ltd)
MV *Viking Valiant* (European Ferries)—Capt A. Shopland

Min. of Agriculture, Fisheries and Food

FRV *Cirolana*—Capt T. H. Finn

Department of Agriculture and Fisheries, Scotland

FPV *Norna*—Capt G. M. Coull

Fishing Vessels

Princess Anne—P. Craven Beeson Deep Sea Fisheries Ltd
St Patrick—D. W. Botford Colne Fishing Company Ltd
Glen Clova—J. Marr and Sons Ltd
Macandy—L. Hojberg Deiga Fish Co Ltd
Janine Marie—J. Perkes Brixham and Torbay Trawlers Ltd

Natural Environment Research Council

RRS *Bransfield*—Capt R. Lawrence

The Post Office

CS *Iris*—Capt I. J. L. Lang RD RNR (Rtd)

British Rail

MV *Sarnia* (Channel Island Ferry)—Capt C. Barker

British Tug Owners Association

Lady Vera—P. Grimble

Sail Training Association

STS *Sir Winston Churchill*—Capt R. W. Rowe
STS *Malcolm Miller*—Capt J. B. Swinfield

Sea Cadet Corps

TS *Royalist*—Lieut Cdr F. Drake MVO RNR

Gordonstoun School

Yacht *Sea Spirit*—Cdr D. Edleston RN (Retd)

HM Sail Training Yachts

Royal Navy—*Adventure, Chaser, Dasher, Racer, Crusader, Explorer*
Army—*British Soldier, Kukri, Trumpeter, Bugler, Piper, Drummer, Fiddler, Flutter, Commando, Rampart, Skirmisher, Lancer, Patroller, Gallopar, Rover, Attacker*
RAF—*Lord Tranchard, Lord Portal*

Seamanship Training Craft

Wyvern, Pegasus, Gryphon, Leopard, Marsiet, Thunderfish, Flashlight, Blue Eye, Trade Wind, East Wind, West Wind, Hindostan

FOREIGN AND COMMONWEALTH WARSHIPS

AUSTRALIA

HMAS *Melbourne*	21	Commodore R. C. Swan CBE RAN
(Flagship of Rear-Admiral G. V. Gladstone AO DSC RAN)		
HMAS *Brisbane*	41	Capt R. W. Barnett RAN

BELGIUM

BNS *Wielingen*	F911	Capitaine de Frégate M. Verbouven BN
(Flagship of Vice-Admiral J. P. L. Van Dyck BN—Chief of Naval Staff)		

BRUNEI

KDB *Pahlawan*	P01	Major C. R. York RRMR

CANADA

HMCS *Huron*	281	Cdr L. J. Cavan CD CF
(Commodore W. A. Hughes CD CF)		

DENMARK

HDMS *Absalon*	N82	Cdr G. Mathiesen RDN

FRANCE

FS *Duguesne*	D603	Capitaine de Vaisseau A. Duchoit FN
(Flagship of Vice-Admiral Wacrenier FN—Prefect Maritime, Premier Region)		

FEDERAL GERMAN REPUBLIC

FGS *Hamburg*	D181	Fregatten Kapitan H. Boettcher FGN
(Flagship of Rear-Admiral K. Thater FGN—Commander, Destroyer Flotilla)		

GREECE

HS *Lieutenant Troupakis*	P52	Lt Cdr G. I. Zographos HN

INDIA

INS *Udaygiri*	F35	Capt K. N. Dubash IN

IRAN

IINS *Kanaan*	P221	Lt Cdr Saeed Zangeneh IIN
IINS *Zubin*	P222	Lt Farid Asghar-zadeh IIN

ITALY

ITNS *Andrea*	D550	Capitano di Vascello S. Marioli ITN

THE NETHERLANDS

HNLMS *Tromp*	F801	Capt J. H. Scheuer RNLN
(Flagship of Rear-Admiral J. H. B. Hulshof RNLN—Commander, Netherlands Task Group)		

NEW ZEALAND

HMNZS *Canterbury*	F421	Capt L. J. Tempero RNZN

NORWAY

HNoMS *Narvik*	F304	Cdr E. H. Hellgren RNoN

PORTUGAL

PoNS *Almeirante Magalhaes Correa*	F474	Cdr R. F. Corte Real Negreo PoN

TURKEY

TNS *Bora*	D358	Staff Lieut Cdr Onder Ozcan TN
(Flagship of Rear-Admiral Emin Gokcan TN)		

UNITED STATES

USS *California*	36	Capt W. O. Rentz USN
(Flagship of Rear-Admiral John C. Dixon Jnr USN—Commander Sixth Carrier Group)		
USS *Bullfish*	676	Cdr D. Volgenau USN

THE FLEET AIR ARM FLY PAST

The Fly Past will consist of 150 aircraft representing all the types at present in service with the Fleet Air Arm and including some which are not yet in squadron service. The Fly Past will be led by the Flag Officer Naval Air Command, Rear-Admiral J. O. Roberts, CB, flying a Wessex aircraft.

The Flag Officer Naval Air Command is responsible for the organisation of the Fly Past. Aircraft will be drawn from the carriers, cruisers and anti-submarine frigates taking part in the Review, the Royal Marines and from all the Naval Air Stations of the Naval Air Command. The Squadrons taking part are:

FIRST WAVE

A single Wessex—Rear-Admiral J. O. Roberts, CB, Flag Officer Naval Air Command; Officer in Command of Fly Past.

Port Wing

700L Squadron (Lynx—Intensive Trials Squadron

705 Squadron (Gazelle)—Pilot Training Squadron

1st Commando Brigade Air Squadron, Royal Marines (Gazelle)—Aerial Command, Recce and Communication Squadron

Centre

737 Squadron (Wessex Mk 3)—Anti-Submarine Advanced Operational Training Squadron

Flights from Guided Missile Destroyers in the Review (Wessex Mk 3)—Anti-Submarine Flights

771 Squadron (Wessex Mk 1)—Search and Rescue and Aircrewman Training Squadron

Starboard Wing

703 Squadron (Wasp)—Anti-Submarine Advanced Operational Training Squadron

829 Squadron (Wasp)—Anti-Submarine Headquarters Squadron

Flights from Frigates in the Review (Wasp)—Anti-Submarine Flights

SECOND WAVE

Port and Starboard Wings

845 Squadron (Wessex Mk 5), 846 Squadron (Wessex Mk 5), 707 Squadron (Wessex Mk 5)—Squadrons supporting the Royal Marine Commando Forces

Centre

814 Squadron (Sea King), 819 Squadron (Sea King), 820 Squadron (Sea King), 824 Squadron (Sea King), 826 Squadron (Sea King)—Anti-Submarine Squadrons from Carriers and Cruisers

706 Squadron (Sea King)—Anti-Submarine Training Squadron

815 Squadron (Sea King) (RAN)—Anti-Submarine Squadron from HMAS *Melbourne*

THIRD WAVE

(Fixed Wing Aircraft)

849 Squadron (Gannet Mk 3)—Airborne Early Warning and Radar Reconnaissance Squadron (HMS *Ark Royal*)

FRADU (Canberra)—Fleet Requirements and Aircraft Direction Unit

809 Squadron (starboard) (Buccaneer—Strike/Reconnaissance Group Attack Squadron (HMS *Ark Royal*)

892 Squadron (port) (Phantom)—All weather Fighter Squadron (HMS *Ark Royal*)

FRADU (Hunter)—Fleet Requirements and Aircraft Direction Unit

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The largest and oldest visiting warship is the Australian aircraft carrier—HMAS *Melbourne* of 19,960 tons which was built at Barrow-in-Furness in 1945. The newest ship is the Greek Navy's assault launcher *Lieutenant Troupakis*, completed this year. The only nuclear-powered surface warship at the Review is the United States 10,000-ton cruiser *California*. This has a speed of more than 30 knots. Another very fast ship present is the 57-knot missile attack craft of the Royal Brunei Malay Regiment which was built at Portsmouth by Vosper Thornycroft Ltd.

ABOVE: *HMS* Hermes, *an anti-submarine warfare ship.* (*see next page*).

Warships of the Royal Navy

Polaris Submarines

The Royal Navy has four nuclear-powered Polaris submarines, each of which can carry 16 missiles: a fire-power greater than all the bombs dropped by both sides during World War II. Once at sea, the Polaris submarine is lost to the enemy, its almost unlimited endurance allowing it to range the oceans freely with little fear of detection. It is independent of shore bases and because of its nuclear propulsion and air-purification system it does not surface for air. Its massive bulk displaces 8,400 tons dived. The three decks offer accommodation which is unusually spacious for a submarine and good domestic facilities are provided for the crews. Each submarine has two crews, known as Port and Starboard, to provide optimum use of these costly vessels. Polaris is a two-stage ballistic missile powered by solid-fuel rocket motors. It is 31 feet long, 4 feet 6 inches in diameter and weighs 28,000 pounds. Fired from the ocean depths by a nuclear-powered submarine, it can devastate a target 2,500 nautical miles away. It should be noted that there are no Polaris submarines at the Review — emphasising the fact that Britain's deterrent is deployed 24 hours a day throughout the whole year.

Britain's four Polaris submarines are named *Resolution*, *Revenge*, *Renown* and *Repulse*.

Fleet Submarines

Nuclear-powered but conventionally armed fleet submarines (SSNs) provide the main striking power of the Fleet and are the most effective anti-submarine warfare weapons available to the maritime commander. They are capable of patrols at continuous high underwater speed, independent of base support, and can circumnavigate the globe without surfacing. Their endurance and sophisticated weapon systems make them formidable adversaries. Space is naturally restricted, but living conditions are unusually comfortable. Fleet submarines have three decks and displace 4,500 tons dived. The first, *Dreadnought*, became operational in 1963. Built in Britain but powered by an American nuclear plant, she has been followed by the all-British *Valiant* class: *Valiant*, *Warspite*, *Churchill*, *Conqueror* and *Courageous*. Now, a further modified class, the Swiftsures, are in service: *Swiftsure*, *Sovereign* and *Superb* have been completed: *Sceptre*, *Spartan* and one other are being built. Four SSNs are in the Fleet gathered here.

Patrol Submarines

Submarines with conventional diesel-electric power continue to be very important. Their underwater endurance is not as great as that of nuclear submarines, but they are fast, silent and difficult to detect. A total of 18 ships of the *Oberon* and *Porpoise* classes are in the Submarine Flotilla and 10 are at this review.

Aircraft Carrier

The aircraft carrier *Ark Royal* (the Flagship of the Commander-in-Chief Fleet) is a mobile airfield of great strategic importance. She can, if necessary, launch strike aircraft to attack an enemy with nuclear or conventional weapons, jet fighters armed with guided weapons to deal with air attacks, and helicopters to detect and destroy submarines. Although completed in 1955, she has been fully modernised. The standard displacement is 43,000 tons, she is 816 feet long, has a beam of 168 feet and a ship's company of 2,570. She carries Phantom, Buccaneer, Gannet, Wessex and Sea King aircraft.

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ABOVE: *An impressive display of sea power; HMS Ark Royal at speed in a lively sea. Her Phantom, Buccaneer and Gannet aircraft are seen on the flight deck; the steam catapult from which an 18-ton aircraft can be launched at 160 mph is on the port side of the ship (right side of photograph).*

NOTE: *HMS Hermes is illustrated on the preceding page; photographs of the Polaris and Fleet submarines are reproduced on pages 15 and 16.*

Helicopter Cruisers

Two *Tiger* class cruisers, *Blake* and *Tiger*, have been reconstructed as helicopter cruisers with facilities for directing naval forces. Each cruiser has four Sea King anti-submarine helicopters. The forward part of the ship retains the traditional cruiser lines, but the after part has been rebuilt to provide the hangar and flight-deck. The successor to these ships will be the *Invincible* class. HM Ships *Blake* and *Tiger* are present at the Review, the latter as Flagship of the Flag Officer Second Flotilla.

Anti-Submarine Warfare Ship

HMS *Hermes* was converted to an anti-submarine warfare (ASW) carrier in 1976. She is equipped with Sea King and Wessex 5 helicopters. At this review, HMS *Hermes* is flying the flag of Flag Officer Carriers and Amphibious Ships (FOCAS).

Guided-Missile Destroyers

County class guided-missile destroyers were built armed with Seacat and Seaslug missile systems, two modern twin 4.5-inch gun turrets and equipped with a Wessex anti-submarine helicopter. Later ships were fitted with Action Data Automation and four ships have been fitted with Exocet missile mountings in place of the second gun turret. HMS *Norfolk* was converted in 1973, followed by HMS *Glamorgan*, *Antrim* and *Fife*. The main propulsion systems of the ships are backed up by gas-turbine boost machinery which provides extra speed when under way or when leaving port. Six County class ships are present for the Review, with Flag Officer First Flotilla flying his flag in HMS *London*.

HMS *Bristol*, the only Type 82 destroyer, has joined the fleet as proving ship for the Sea Dart missile system and the Ikara anti-submarine weapon. HMS *Bristol* is not at the review.

Assault Ships

HMS *Fearless* and HMS *Intrepid* are the most versatile vessels yet built by the Royal Navy for amphibious warfare. Each is fitted out as a naval assault group' brigade headquarters, from which naval and military personnel, working in close co-operation, can mount and control an amphibious operation. They can transport a military force complete with full

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RIGHT (top to bottom): *A conventional diesel-electric powered patrol submarine, HMS* Blake, *a Tiger class helicopter cruiser with one of her Wessex helicopters. Aft of the second funnel is the hangar and flight deck for her four helicopters; HMS* Glamorgan, *a County class destroyer. Between the forward gun and the bridge her Exocet missile system can be seen; HMS* Fearless, *an amphibious assault ship. Beneath the flight deck tank-carrying landing craft are housed.*

supporting armour. Landing craft, capable of carrying heavy tanks, are housed in the ship's dock and launched from the open stern. The ships can operate a flight of assault helicopters and are armed with the Seacat guided-missile system and two 40-mm Bofors guns. One assault ship is also used as the Dartmouth Training Ship, providing young officers with their first sea experience. HMS *Fearless* is at the review.

Sheffield Class Destroyers

HMS *Sheffield* and HMS *Birmingham* of this class have already entered service and six more are under construction. Four of them, HM Ships *Cardiff*, *Coventry*, *Glasgow* and *Newcastle*, have already been launched. A further ship of this class has been ordered. They displace 3,500 tons, have a length of 410 feet, a beam of 47 feet and are powered by Rolls-Royce Olympus and Tyne gas turbines. The armament includes a new automatic rapid fire 4.5-inch gun, anti-submarine torpedo tubes and the new Sea Dart missile system. They will operate a Lynx helicopter. HMS *Birmingham* has been chosen as the Admiralty Board yacht for this review and HMS *Sheffield* is in the lines.

Amazon Class Frigates

HMS *Amazon*, the first of a new class of commercially designed frigates (Type 21), was accepted into service in 1974 and was followed by HMS *Ambuscade*, *Arrow*, *Active* and *Alacrity*. Two other ships are under construction: *Ardent* and *Avenger*. They displace 2,500 tons, have a length of 384 feet, a beam of 43 feet, and are powered by Olympus and Tyne gas turbines. They are armed with a new automatic rapid fire 4.5-inch gun, the Seacat missile system, and operate a Wasp anti-submarine helicopter (to be replaced by the Lynx). The Exocet missile system is being fitted in HMS *Active*, *Alacrity*, *Arrow*, *Ardent* and *Avenger*, and other ships of the class will be fitted at a future date. Four of this class are here today.

Rothesay Class Frigates

The nine *Rothesay* class anti-submarine frigates have been modernised to operate Wasp helicopters and the Seacat missile system. Other improvements include full air-conditioning, modernised operations room, better communications facilities and an improved gunnery control system. Four ships of this class are present.

Leander Class Frigates

The Royal Navy's most numerous frigates are those of the *Leander* class, totalling 26 ships. Equipped to perform a general-purpose role, they are capable of engaging ships, aircraft and shore targets in addition to their primary role of submarine detection and destruction. Their original armament consisted of a triple-barrelled anti-submarine mortar,

the Seacat guided-missile system, twin 4.5-inch guns and a Wasp helicopter, which carries homing torpedoes to deal with submarines at long range. The main propulsion machinery consists of two sets of steam turbines developing 30,000 shaft horse-power and giving speeds in excess of 30 knots. They are among the finest sea-keeping ships ever possessed by the Royal Navy and have an excellent performance in bad weather. Certain ships are being refitted to operate the Ikara anti-submarine weapon system, and others, the Exocet surface-to-surface guided-weapon system. Fifteen *Leander* class ships are in the review lines, showing the various weapon-fits above.

Type 12 Whitby Class Frigates

The six Type 12 (*Whitby* class) frigates were the first cost-war design A/S frigates to join the Royal Navy. The *Rothesay* and *Leander* classes improved on the Type 12 design. The remaining *Whitby* class ships are mainly used for training and their armament and accommodation have been modified to fit the new role. HMS *Torquay*, now used for navigation training, and HMS *Eastbourne*, used for MEA apprentices training, represent this class.

Type 81 Tribal Class Frigates

The Tribal class are general-purpose frigates. New equipment includes the Searaf missile system. The main machinery is supplemented by gas turbines to boost their speed and enable them to leave harbour at short notice. They are equipped with a Wasp helicopter. Four of this class of seven ships are at the Review. Their names, *Ashanti*, *Eskimo*, *Gurkha*, *Mohawk*, *Nubian*, *Tartar* and *Zulu*, perpetuate some of the famous destroyer names of World War II.

Type 81 Salisbury Class Frigates

These ships are primarily for the direction of carrier-borne and shore-based aircraft. For this role they are fitted with highly developed electronic equipment. They can also be used for anti-submarine warfare. HMS *Salisbury* and HMS *Lincoln* have been fitted with the Seacat missile system. HMS *Lincoln* is fitted with controllable pitch propellers. HMS *Chichester* has been modified for guard-ship duties in the Far East. HMS *Salisbury* is the only ship of this class in the Review.

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FACING PAGE (top to bottom): *HMS Zulu, a Tribal class frigate; HMS Sheffield, name ship of her class of destroyers; HMS Phoebe, a Leander class frigate which featured as HMS Hero in the popular BBC TV series 'Warship'; HMS Plymouth, a Rothesay class frigate.*

THIS PAGE (top to bottom): *HMS Arrow, a Type 21 frigate; HMS Salisbury, name ship of her class; HMS Dundas, a Blackwood class frigate; a Mine Countermeasures squadron of the 'Ton' class (from top): HM Ships Crofton, Shavington, Walkerton, Stubbington, Ashton and Laverton.*

Type 41 Leopard Class Frigates

Four *Leopard* class frigates were built for the anti-aircraft protection of surface forces. Their armament is two twin 4.5 automatic radar-controlled turrets and an anti-submarine mortar. HMS *Lynx* is present at the Review.

Type 14 Blackwood Class Frigates

The *Blackwood* or Utility class frigates were small A/S frigates armed with two small guns and two three-barrelled A/S mortars. HMS *Exmouth* was converted to be the first gas-turbine-propelled major warship. Three ships of this class are still used for training at sea and two others are retained as Harbour Training Ships. Two of the class are at the Review.

Patrol Boats

The Navy has ordered four 190-ton Bird class patrol boats, based on the Seal class long-range recovery craft. Their duties will include fishery protection. HMS *Petrel* is present at the Review, manned by men of the RNR.

A recent order has been placed for five Isis class patrol vessels for protection of oil-rigs in the North Sea. These ships will be approximately 1,250 tons and the earliest vessels have been launched.

Fast Training Boats

Three fast training boats, *Scimitar*, *Cutlass* and *Sabre*, provide anti-fast-patrol-craft training for ships and helicopters of the fleet. They are powered by two sets of engines, the main engines are gas turbines supplied by Rolls-Royce Limited and the auxiliary drive engines are diesels manufactured by Fodens Limited. Their top speed is in excess of 40 knots. All are at the review.

Mine Countermeasures Vessels

The Navy has 38 coastal minehunters or minesweepers remaining of the 'Ton' class which once numbered over 100 ships. Between them, they can deal with all types of mine. Five ships have been converted to patrol craft and are fitted with an extra 40-mm Bofors gun. HMS *Wilton*, built of glass-reinforced plastic on existing lines, is the largest GRP ship in service. A new class of larger GRP MCM vessels has been ordered following extensive trials with *Wilton*. Twenty 'Ton' class vessels are present at the Review.

The 'Ham' class of inshore minesweepers also once numbered over 100 vessels. Nine ships of this class are present here — either as the training ship of university RNR units or as RNXS ships. The RNXS ships can be seen patrolling the anchorage.

Survey Ships

One of the most important peacetime tasks of the Royal Navy is hydrographic and oceanographic surveying. Information from surveys is needed for Admiralty charts which have a world-wide sale and are used by ships of many nations. The surveys are the responsibility of the Navy's Surveying Service which has been operating throughout the world since the formation of the Hydrographic Department in 1795. It has ocean-going ships, coastal vessels and inshore craft, each carrying survey motor boats. Some ships also carry helicopters. Three ocean survey ships (one flying the flag of the Hydrographer of the Navy), four coastal survey ships and five inshore survey craft are present.

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LEFT: *Naval fixed wing aircraft taking part in the Fly Past* (from top to bottom):

Phantom. *A twin-engined, all-weather fighter and ground attack aircraft operated from HMS* Ark Royal. *Crew: pilot and observer. Maximum speed greater than Mach 2.*

Buccaneer. *A twin-engined, low-level strike aircraft operated from HMS* Ark Royal. *Crew: pilot and observer. Maximum speed of approx. 700 mph.*

Gannet. *A turbo-prop aircraft operated from HMS* Ark Royal. *Its main role is airborne early warning, i.e. the detection of enemy air and surface forces at great distances from the carrier. Crew: pilot, two observers. Maximum speed 310 mph.*

Canberra *and* Hunter (not illustrated). *These aircraft are based at RNAS Yeovilton and are operated by the Fleet Requirements and Air Direction Unit (FRADU). Their duties include target-towing, direction training and weapons alignment.*

Helicopter Support Ship

RFA *Engadine*, helicopter support ship, was specially designed to meet training requirements for the flying, handling and maintenance of helicopters. She does not carry her own flight, but the hangar can house four Wessex and two Wasp or two Sea King helicopters.

The Royal Fleet Auxiliary

The Royal Fleet Auxiliary (RFA), the Merchant Navy manned fleet which replenishes warships at sea with fuel and stores, comprises some 40 ships, ranging from a 1,600-grt coastal carrier to a 42,500-grt mobile reserve tanker. Some are fitted to operate helicopters. Five *Rover* class tankers are in service. The Royal Fleet Auxiliary is also responsible for the *Sir Lancelot* class logistic ships used in amphibious landings.

Naval Hovercraft Trials Unit

The Naval Hovercraft Trials Unit carries out trials and associated training in support of the possible development of hovercraft in the mine countermeasures role. Two hovercraft are moored in the lines of the Review, and have been used during the previous week to ferry mail, passengers and urgently needed stores to the anchored Fleet.

Other Units

In addition to the classes already described, the Royal Navy and its sea-going supporters, the Royal Fleet Auxiliary, Royal Maritime Auxiliary Service and Royal Naval Auxiliary Service, operate many other vessels. These include the Antarctic patrol ship HMS *Endurance*, small oilers, waterboats, ammunition and store carriers, harbour tugs, torpedo-recovery vessels and small cross-harbour passenger craft.

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RIGHT: *Naval helicopters participating in the Fly Past* (from top to bottom):

Sea King. HAS 1. *A two-engined anti-submarine helicopter which can be used on other duties where its long endurance and all weather capability are of advantage. Crew: two pilots, observer, sonar operator.*

Wessex. HAS 3, HU 5 and HAR 1. *All three versions are in service with the FAA and are used on anti-submarine, troop-carrying and search and rescue duties. Marks 1 and 3 have a single gas turbine; Mark 5 has two. Max. speed 120 mph.*

Lynx. HAS 2. *This new twin-engined helicopter which will replace the Wasp will enter service shortly and operate from frigates and destroyers. Crew: pilot and observer. Max. speed over 150 mph.*

Wasp. *A single-engined helicopter operated from frigates, destroyers and survey ships. Its main roles are anti-submarine and anti-fast patrol boat. Crew: pilot and missile aimer. Max. speed 120 mph.*

Gazelle. *Light single-engined helicopter used for training. Normally shore based but it is also used by the Royal Marines on sea-borne operations. Crew: pilot. Max. speed 190 mph.*

New Classes of Ships Under Construction

To meet the changing role of the Royal Navy, new classes of ships are being built. Some of the largest ship-types include:

a. The anti-submarine or 'through-deck' cruiser — a class planned to consist of three ships capable of operating the Sea Harrier V/STOL aircraft and Sea King helicopters. The planned complement is approximately 1,000 officers and ratings. The ships will be propelled by gas-turbine engines. HMS *Invincible*, the name-ship of the class, was ordered from Vickers of Barrow on 17 April 1973. The second ship, to be named *Illustrious*, was ordered from Swan Hunter in 1976.

b. The Type 22 frigates are the first all-metric ships designed for the Royal Navy. They will displace 3,500 tons, be gas-turbine propelled, armed with the Sea Wolf missile system, and will operate a Lynx helicopter. HMS *Broadsword*, the lead-ship, was launched on 12 May 1976 by Yarrow. Her sisters, HMS *Beaver*, and one unnamed (at time of writing) have been ordered.

c. Fort class Royal Fleet Auxiliaries — two under construction. These 605-foot-long diesel-engined afloat support ships will be capable of operating a helicopter. The first vessel, named *Fort Grange*, was launched on 9 December 1976.

The Submarine Service

Two hundred years ago, on 6 September 1776, Ezra Lee, a sergeant in the American Revolutionary Army, set off in a strange barrel-shaped object to make the first submarine attack in history—29 years before the Battle of Trafalgar. Lee's target was HMS *Eagle*, the flagship of the British fleet blockading New York harbour during the American War of Independence. His submarine, the *Turtle*, resembled a wooden beer-barrel, was powered by foot-operated propellers and contained enough air to remain submerged for only 30 minutes.

The method of attack was to submerge below the target, then rise up underneath its hull and screw in an auger to which was attached a delayed-action mine. Having done that, Ezra Lee was supposed to pedal away (his pedals were connected with one of the first propellers ever invented), and await the destruction of the ship he had attacked. Things went wrong for Ezra Lee. He found it impossible to penetrate the *Eagle*'s hull. He was probably suffering from the effects of carbon-dioxide poisoning inside his tiny craft.

However he was sensible enough to retreat when he saw his efforts were useless, but by this time the British fleet had been alerted and one or more British rowing boats began to pursue him. Lee realised that the large explosive package on the back of his craft was slowing him down so he jettisoned it. The package blew up in the faces of the pursuing British and although it did no damage must have been very frightening. In any event it probably persuaded the British admiral—Admiral Lord Howe—to retire to the comparative safety of the outer harbour where the effect of his blockading fleet must have been much less.

The attack itself was not especially significant except that it marks the first submerged attack by any vessel against any ship. For that alone the events of 6 September 1776 are historic. What is more important is the strategic effect of this tiny unit of the revolutionary forces against an overwhelming enemy force. In brief, it proved to be a deterrent. It proved that a submarine does not necessarily have to sink a ship or even fire a weapon to achieve its aim. Sometimes its feared presence alone can be enough. In that respect, *Turtle* of 200 years ago had much in common with Britain's present-day deterrent, the nuclear-powered Polaris submarine.

However, the British Government and the Royal Navy took a long time to appreciate the value of the submarine. It was not until 125 years after the *Turtle* attack that the Royal Navy acquired its first submarine. But 167 years later, during World War II, the *Turtle*'s exploit was almost exactly copied by Royal Naval midget submarines, which successfully attacked the German battleship *Tirpitz*.

Turtle was a concept in advance of its time—but the submarine story really began centuries before: it was Archimedes who formulated the principles of physical submersion in the 3rd century BC and the first recorded mention of a real submarine stems from the writings of an Englishman, William Bourne, in 1578. In the 17th century submarine designs were abundant and designers gradually concentrated more and more on the sinister purpose of a vessel which could hide beneath the waves.

After the *Turtle* exploit Britain had the opportunity to acquire its own submarine when another American, Robert

Fulton, offered his *Nautilus* design to the British Government after the French had rejected it as 'a dishonourable form of warfare.' In 1801 Fulton's submarine was examined by a committee of which Pitt was a member. Pitt's enthusiasm was scathingly dismissed by one of Britain's greatest sailors, the First Sea Lord, the Earl St Vincent, who said: 'Pitt is the greatest fool that ever existed to encourage a mode of war which those who command the seas do not want and if successful will deprive them of it.' The earl's view was to be the basis of British policy for nearly 100 years.

As the 20th century dawned six navies owned a total of 40 submarines. Eleven more were being built. France was well in the lead with a total of 14 built or building. The United States had two, of which the Holland-type was reckoned to be the best in the world. Even Italy, Portugal, Spain and Turkey had at least one craft each. Only in Britain was there still active discouragement.

In 1901, during exercises, the French submarine *Gustave Zede* made a mock attack on the French battleship, *Charles Martel*, and hit her with a dummy torpedo. This was a lesson in the future shape of sea power which could no longer be ignored and the British Admiralty were finally forced to reject St Vincent's policy. Five submarines of the American Holland-type were promptly ordered for the Royal Navy for intensive research into anti-submarine measures.

When HM Submarine No. 1 went down the slipway at Vickers' Barrow-in-Furness shipyard on 2 October 1901, there were still those in the Royal Navy and in the Government who hoped it would fail. At that time Britannia ruled the seas. Anything that might put a stop to such a happy state of affairs was greatly to be discouraged and, although they did not admit it, both the admirals and the politicians of the time recognised that underwater devices of any kind might very well jeopardise the existence of the mighty British battle fleets upon which the whole might and majesty of the British Empire depended. Underhand, unfair and damned un-English—that was a popular view. One admiral was even publicly advocating that captured submariners in wartime should be hung as pirates.

However, submarines found a champion in the form of Admiral Jacky Fisher, the man responsible for the building of the massive Dreadnought battle-ships that formed the spearhead of the British Fleet during World War I.

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FACING PAGE (above): *Britain's most devastating weapon: the nuclear propelled Polaris missile Polaris submarine. None of the ships of her class will be at the Review—all are deployed on Deterrent duty, 24 hours a day.* (below): *The Royal Navy's first submarine, Holland Boat No. 1, launched in 1901.*
RIGHT: *A stern-on view of a Polaris submarine.*

In 1904 Admiral Fisher wrote: 'It's astounding to me, perfectly astounding, how the very best amongst us absolutely failed to realise the vast impending revolution in naval warfare and naval strategy that the submarine will accomplish!'

Thereafter submarines never looked back. They became more efficient and more self-sufficient. There were many setbacks in the early days and some tragic losses but steadily the Royal Navy's confidence, experience and knowledge grew and by 1914 the submarine service was formidable, effective and efficient.

For more than 100 years since the American Civil War, submarines had been thought of merely as harbour defence vessels and a counter to blockading ships. The German submarine, U-9, put paid to that 'defence only' concept a few days after the opening of hostilities in World War I. In less than an hour this lone submarine, operating in the North Sea well away from her base, sank three British cruisers, *Aboukir*, *Cressy* and *Hogue*.

This traumatic demonstration for the British gave massive impetus to the submarine-building programme. As a result naval strategy had to be drastically changed. The Fleet had to steam at high speed, zigzag and be escorted by destroyer screens at all times. Later in the war its operations were severely restricted in the North Sea and it was considered too dangerous for it to go into the southern part at all. The Germans, however, concentrated their U-boats directly against commerce and by April 1917 they were sinking merchant ships at such a rate that defeat for the Allies was in sight.

U-boats were defeated—but only just—as a result of a huge Allied effort, both naval and civil and based on the convoy system. It was, however, a very close run thing, and the U-boats proved themselves something which a greatly superior battle fleet, on which sea power had depended for centuries, had been helpless to counter. By attacking commerce the submarine had become a potentially war-winning weapon.

British submarines were not without their successes during World War I. They were particularly active in the campaign around Turkey. Four Victoria Crosses were won by submarine commanders in these waters. Submarine E-14 was so successful in its attacks that the Turks believed they were being invaded.

One of the most heroic operations by a British submarine was its part in the immobilisation of the U-boat base at Bruges. In 1917 Allied merchant ship losses reached the staggering total of nearly 4,000,000 tons—most of it caused by U-boats operating from the base.

A daring plan to immobilise the base was set for St George's Day 1918. A key to this famous attack on Zeebrugge was the destruction of a viaduct which would prevent reinforcements getting to the harbour defence positions. Submarine C-3, commanded by Lieutenant Richard Sandford, was filled with explosives and ordered to ram the viaduct. Having run the final mile under full view of the German guns, Sandford ploughed his submarine through the girders of the viaduct, lit the five-minute fuse, then he and his five crew members made their escape in a small boat. Under heavy fire Sandford and two of his crew were wounded but were saved by the shattering explosion as C-3 blew up.

Between the wars—apart from some rather odd designs—there was little development in the submarine field in Britain. Britain's between-the-wars attitude towards the submarine is reflected in the stands she took at two international conferences—in 1922 and 1930—in pressing for the abolition of the submarine as a weapon of war. Britain received scant support for her proposals but did succeed in getting agreement that submarines would never again be used for commerce-raiding.

However, during World War II U-boats came as near to winning as in World War I by concentrating on merchant shipping and again were only narrowly defeated. Underwater detection equipment (ASDIC), radar, the convoy system and American shipbuilding potential were mainly responsible.

Allied submarines suffered terrible losses also, but achieved great successes—sinking approximately a third of the Japanese Navy's warships and contribu-

ting largely to the defeat of Rommel in North Africa by cutting off his supply line in the Mediterranean.

It was in the Mediterranean that HM Submarine *Upholder*, commanded by Lieutenant-Commander David Wanklyn, failed to return after 24 brilliant wartime patrols. The Admiralty took the unprecedented step of publishing a special communique praising *Upholder* and all her crew for their long and arduous duty in the Mediterranean. "The ship and her company are gone but the example and inspiration remain." Wanklyn had already established himself as a brilliantly successful submarine commander when on his seventh patrol he sank several large merchant ships, even though his listening gear was out of action. For this patrol Wanklyn was awarded the Victoria Cross but he went on to score even more successes before his boat was lost.

In spite of their small size Royal Navy midget submarines scored many successes against the enemy.

In 1943 heavy German warships were using Norwegian fiords as bases from which to attack trade routes to the North Atlantic. In an attempt to strike the German raiders, six midget submarines, known as X-craft, were sent to force an entry into the protected anchorages. After travelling for 10 days and covering 1,000 miles, two midget submarines commanded by Lieutenant Donald Cameron and Lieutenant Godfrey Place arrived at their objective within minutes of each other on 22 September and attacked the battleship *Tirpitz* in Kaa fiord. Cameron and Place released their charges and attempted to escape, but by this time the German defences were aware of their presence and a heavy counter-attack resulted in both men having to scuttle their craft. They were awarded the Victoria Cross.

Another midget submarine succeeded in sinking the Japanese cruiser *Takao* in the Johore Strait, Singapore, by placing limpet mines under the great ship's hull. The captain, Lieutenant Ian Fraser, and the ship's driver, Leading Seaman Joseph Magennis, were also awarded the Victoria Cross.

These attacks bore a marked similarity to the exploit of the *Turtle* in the American War of Independence.

Submarines were used for a variety of tasks during World War II. Their natural stealth made them ideal for cloak-and-dagger operations—landing spies, commando raids, picking up important refugees and escapers from the enemy coast. Submarines also used their 'invisibility' to sneak close inshore to bombard enemy shore installations, trains, tunnels, viaducts, jetties, and even shore batteries. The submarine's need to surface periodically for a 'breath of air' was still its weakness however.

In spite of their defeat the Germans had led the field in submarine development and, by 1944, had perfected the schnorkel-fitted high-speed underwater craft, on which the diesel-electric submarines in service with the Royal Navy today are largely based. If this type had come into service earlier in large numbers the Germans could have won World War II. The schnorkel, or snort, as it is known in the Royal Navy, enabled submarines to 'breathe' without surfacing and, for the first time ever, to remain submerged for several weeks. The British fleet adopted the system after World War II and made it extremely effective.

At the Coronation Review of 1953 the submarines taking part were among the most important units of the fleet. But 10 years later the Royal Navy entered the nuclear age and the whole concept of submarine warfare altered once again.

Nuclear power at last freed the submarine from any dependence on the earth's natural atmosphere. It gave the submarine an almost unlimited endurance, high underwater speed and a vast source of electrical power with which to operate the increasingly complex and sophisticated forms of sensors, computers and other electronic aids to their fighting capabilities. The nuclear submarine, able to control her own atmosphere, could dive into the ocean's depths and remain submerged for weeks—circumnavigating the world underwater if need be.

Today the Royal Navy has nine nuclear-powered attack submarines in service. Three others are under construction and there are plans for even more advanced classes of this type. There are four nuclear-powered Polaris submarines which carry Polaris missiles which form Britain's contribution to the NATO strategic deterrent. In addition there are 18 diesel-electric submarines.

Submarines of all types are among the most powerful vessels in the world. But most important, they are masters of the deterrent. Deterrence is an overworked and little understood word nowadays. We tend to think of it in terms of the nuclear deterrent—Polaris.

There is no doubt that Polaris and its successors are the most effective deterrents against world war that have ever been devised, but deterrence is not simply a matter of threatening an enemy with total destruction. The modern submarine, nuclear or diesel-electric, is able to act in the role of a speed-trap or to look from behind hidden windows or to listen discreetly to whatever is in the air. It can do so in waters where a potential enemy may wish to operate or off a coastline where a potential or actual enemy is hoping to mount some kind of warfare. If the potential or actual enemy suspects that a submarine is in the vicinity, that submarine becomes a very, very effective deterrent. Furthermore, the submarine, lying passively in wait like a crocodile, is ready and able to switch to the offensive at a moment's notice. It is already where the naval staff require it to be and it is hidden and extremely difficult to find.

In short, submarines have become, over the years, an exceedingly effective deterrent with other forms of defensive forces. Nuclear submarines obviously have enormous advantages by means of their virtually unlimited endurance at high speed and their capability of travelling vast distances undetected. But it must not be thought that the diesel-electric submarines are outdated: they have more problems when operating in enemy-controlled areas, but their chances of success and survival rate highly in the face of the weapons available to units opposed to them.

The *Turtle*, 200 years ago, showed the way towards a submerged deterrent that is unique in modern warfare.

* * *

HMS Warspite, a fleet submarine. Ships of her class are nuclear propelled but conventionally armed and they provide the Navy with its most deadly anti-submarine weapon. Of great endurance, they can cruise around the world underseas without surfacing.

HILL HEAD
(PUBLIC ANCHORAGE)
LEE
GOSPORT
HARBOUR
PORTSMOUTH
BROWNDOWN
FLEET BOATS
M.O.D. CRAFT
HASLAR
(PUBLIC ANCHORAGE)
Clarence Pier
South Parade Pier
RYDE
MIDDLE
SPITSAND
Spit Sand Fort
HORSE SAND
ANCHORING PROHIBITED
50°
46'
PEEL BANK
(PUBLIC ANCHORAGE)
MOTHER BANK
ANCHORAGE FOR SPECIALLY AUTHORISED VESSELS ONLY
Horse Sand Fort
No Man's Land Fort
Ryde Pier
RYDE SAND
(PUBLIC ANCHORAGE)
ISLE OF WIGHT
Longitude 1° 12' West from Greenwich
NAUTICAL MILES

Craft on Patrol

SHOULTON	THAKEHAM
GLASSERTON	SHIPHAM
FUNTHAM	PORTISHAM
DITTISHAM	LOYAL CHANCELLOR
PUTTENHAM	LOYAL MODERATOR
PAGHAM	LOYAL PROCTOR
TONGHAM	

Corrected to 2nd. May 1977

The Fleet Air Arm

The first occasion when the Royal Navy took to the air at sea was in August 1908 when trials were conducted in the use of man-carrying observation kites towed by surface ships. Even this event was predated by some five years when the Royal Navy first examined the potential of kites at Whale Island, Portsmouth, in March 1903. In that same historic year, 1908, the Admiralty ordered their first rigid airship, confirming their interest in aviation. In January 1912 a short S27 biplane took off from the cruiser HMS *Africa* and on 13 May that year the Naval Wing of the Royal Flying Corps was formed. The potential importance of naval aviation was fully recognised when the Royal Naval Air Service was established on 1 July 1911 and the new arm of the Royal Navy played a spirited role in the air, at sea and in the land battles that were to follow.

The Royal Naval Air Service was merged with the Royal Flying Corps on 1 April 1918 to form the Royal Air Force and in the lean years between the world wars naval air capability made only slow progress. Eventually the Navy's need to control its own air activity was recognised and the Admiralty became fully responsible for the Fleet Air Arm in May 1939.

* * *

Sixty years of aeronaval development link the two aircraft illustrated on this page. The Phantom is the Navy's latest and most potent strike aircraft; the World War I Short 184 Seaplane, seen with a torpedo between her floats, took part in the Battle of Jutland. Her remains are preserved in The Fleet Air Arm Museum at Yeovilton.

The Fleet Air Arm entered World War II with aircraft which were few in numbers and lacking performance when compared to their enemies'. Nevertheless, great success was achieved during the course of the war, most particularly the night attack on the Italian battle fleet in the heavily defended port of Taranto which sank or disabled half of the enemy in little more than an hour for the loss of only two Swordfish biplane torpedo bombers. By the end of the war the Fleet Air Arm had increased its first-line strength to 1,503 aircraft, with many more in support, training and reserve. The end of the war witnessed a rapid demobilisation and reduction in strength but the Fleet Air Arm was established as an essential element of the fleet.

Twenty-four years ago, the line-up for the Coronation Review of the Fleet included eight aircraft carriers, two belonging to Commonwealth navies, and 36 naval air squadrons were represented in the fly past. Two more operational carriers and a maintenance carrier, with four squadrons, were in the Far East, where the Korean war had six weeks yet to run. That the Royal Navy's aviation was entering a period of change was evident from the presence of the six squadrons of jet fighters and the flights of turboprop strike and anti-submarine aircraft which took part in the fly past; a hint of the more distant future was provided by the one squadron of rescue helicopters and a flight of Sikorsky Whirlwind general-purpose helicopters.

The heavier jet aircraft, with their high landing speeds, required new launching and landing techniques if they were to be operated efficiently and safely, and by the

beginning of 1953 teams of officers of the Royal Navy and the Royal Aeronautical Establishment, Farnborough, had developed and tested three inventions which proved to be essential to the effectiveness of the aircraft carrier. Of these by far the most important was the angled deck: by altering the centre-line of the landing area a few degrees to the left of the ship's centre-line, the pilot of an approaching aircraft was given an unobstructed 'runway' from the stern to a point on the port edge of the flight deck roughly in line with the 'island' bridge structure—if he failed to catch an arrester wire, then he could simply open up the throttle and go around again, whereas with the original straight deck he had been confronted with a large steel-wire or nylon barrier protecting aircraft parked ahead of the landing area. Now the park area was safely to starboard of the approaching aircraft and no barrier was needed for a normal approach.

The 'batsman' had controlled deck landings in the Royal Navy for 15 years, but his usefulness had declined as aircraft approach speeds increased, and he was replaced from 1954 by the mirror deck-landing system. By aligning the reflection of a spotlight with reference marks on either side of a large polished steel mirror set at the side of the landing area, the pilot could make an approach at a steady angle of descent which was so accurate that a single arrester wire could be designated as the 'target wire', although at least three other wires were provided to cater for slight inaccuracies in flying. Within 10 years, the mirror was replaced by a projector sight, using narrow beams of direct light instead of a single reflected source but working on the same principle.

Also present at the 1953 review was HMS *Perseus*, built as a maintenance carrier but modified in 1951 to evaluate a revolutionary form of catapult in which the motive force was provided by steam from the ship's boilers. The steam was released at high pressure into a cylinder to propel a piston to which the aircraft was attached by a wire 'bridle'. The yards of wire rope and heavy rams associated with hydraulic catapults were thus eliminated, the piston (and aircraft) was accelerated progressively instead of in one convulsive jerk, reducing the stress on the aircraft and crew, and deceleration of the only moving part at the end of the 'stroke' was simplified. The potential of the steam catapult was impressive: in 1953, the hydraulic catapult could launch a 7-ton aircraft at 115 mph—ten years later the steam catapult was launching 18-ton aircraft at 160 mph.

The United States Navy adopted all three British inventions without delay—indeed, the first carrier with an angled deck was the USS *Antietam*, which had visited Spithead two months before the review, and the first with steam catapults was the USS *Hancock*, completed in January 1954, 13 months before HMS *Ark Royal*.

Five new carriers were commissioned between 1953 and 1960, all capable of operating jet aircraft. HMS *Ark Royal* and the smaller *Centaur*, *Bulwark*, *Albion* and *Hermes* joined HMS *Eagle* and the reconstructed *Victorious* to provide a powerful fleet up to the mid-sixties, when defence economies began to take their toll. By 1970, only the *Ark Royal*, *Eagle* and *Hermes* were still operating jets, *Centaur* and *Victorious* had been withdrawn for scrapping, and *Bulwark* and *Albion* were operating helicopters.

The helicopter's advantages were obvious to the Navy even before World War II, and as early as 1937 a series of trials was conducted aboard an aircraft carrier with an autogyro—at that time the only practical rotary-winged aircraft. In 1943, an American-built Sikorsky helicopter was embarked on a British merchant ship for anti-submarine trials but not until after the end of the war was a suitable aircraft, capable of carrying either detection gear or a weapons load, available for service. The Sikorsky S-55,

Continued on page 20

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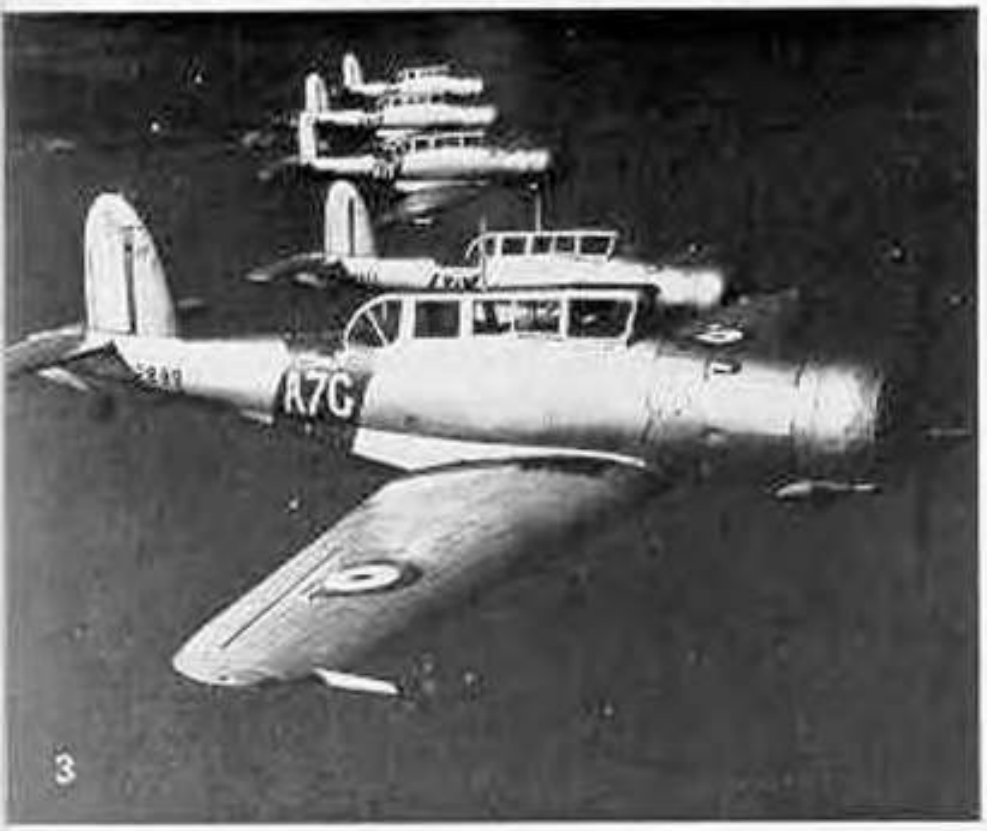
THIS PAGE: *Two historic photographs from World War I. The top one shows an experimental launch on 31 July 1918 of a Sopwith Camel scout from a lighter towed by a destroyer. A few days later, using this technique the pilot destroyed German Zeppelin L.53. The aircraft had to be ditched after the sortie. In the bottom photograph a Sopwith '1½ Strutter' is seen making the first successful landing on the deck of HMS* Argus.

FACING PAGE: *(1) A Fairey Flycatcher over HMS* Eagle *in the early 1930s. Flycatchers were the standard front-line FAA fighters from 1924 to 1932. (2) A Fairey Swordfish taking off from an escort carrier during World War II. Escort carriers with their Hurricane and Swordfish aircraft provided air cover for convoys out of range of shore based aircraft. (3) Blackburn Skuas of 803 Squadron. The Skua was the FAA's first operational monoplane and although designed as a dive-bomber, one of 803 Squadron shot down a Dornier Do18 off Norway on 29 Sept 1939, the FAA's first 'kill' in World War II. (4) Arming Grumman Hellcats with rockets during the Pacific campaign in World War II. (5) The Hawker Sea Fury FBII, the last piston engined fighter in the FAA. This type of aircraft gave sterling service from 1947 to 1957, particularly in the Korean war. (6) The first ever operation of a jet aircraft from an aircraft carrier: a de Havilland Sea Vampire taking off from HMS* Ocean *on 3 December 1945.*



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named Whirlwind in British service and later built under licence by Westland Aircraft, was such a helicopter, but the first naval squadron was formed for the assault transport role and was despatched to Malaya at the beginning of 1953 to operate against the Communist insurgents in the jungle. A year later, the first RN anti-submarine (A/S) helicopter squadron was formed, its Whirlwinds equipped with detection equipment which could be lowered into the water while the aircraft was hovering. Three times as fast as the A/S ships with which they worked, teams of helicopters could detect, track and overtake even the fastest submarines, with one of their number delivering the *coup de grâce* with a homing torpedo. Since 1960, the helicopter has been the only shipborne A/S aircraft, and improvements in equipment, including the fitting of radar and longer-ranging Sonar, has resulted in the Westland Sea King—a 'flying frigate' which can not only detect and destroy submarines by day and night in all weather conditions, but can also control other helicopters, fixed-wing aircraft and even ships in a hunt.

In the late fifties it was decided that the most effective method of delivering a long-range A/S weapon from a ship would be a light helicopter, launched and controlled by the ship to drop a torpedo or depth-charges well outside maximum submarine torpedo range. Such a helicopter could also be used for visual searches, communications and even for light attack tasks. The *Leander* and *Tribal* class frigates were designed to carry such an aircraft and from 1964 the Westland Wasps of 829 Squadron have seen world-wide service from these ships. The Westland Wessexes embarked in the County class guided missile destroyers fulfil a similar role, but with the added advantages of Sonar and radar fitted in the larger aircraft. From 1977, the Anglo-French Lynx helicopter will begin to replace the Wasp.

Royal Navy survey ships also carry the Wasp helicopter in the 'B' class and Ice Patrol Ship HMS *Endurance*. The first such ship to embark a helicopter was HMS *Vidal*, in 1954, and her experience demonstrated that the use of the aircraft for landing, supplying and recovering survey parties greatly increased the efficiency of the ship.

The Navy's experience of helicopter troop-carrying operations, gained in the Malayan jungle between 1953 and 1956, was broadened at the end of 1956 when Royal Navy helicopters flew from two carriers to land troops to occupy vital positions at Port Said. Covered by the fixed-wing aircraft from the three strike carriers with the fleet, the helicopter-borne landings were completely successful and led to the formation of the first 'commando helicopter squadron' two years later. HMS *Bulwark* was converted as a commando carrier to operate one large squadron of helicopters and became operational in the Far East early in 1960. She was later joined by the *Albion* and, in the early seventies, by the *Hermes*. Royal Marine commandos from these ships were landed at Kuwait in 1962, to bolster the British presence when that small country was threatened by Iraq, and in East Africa in 1963 to quell mutinies by local troops, and they were the last British forces to leave Aden, in 1967. Between 1963 and 1966, all the commando helicopter squadrons saw extensive service in Borneo, during the confrontation with Indonesia. As well as operating from airfields in Sarawak and Brunei, the Whirlwinds and Wessex of the four squadrons involved flew from primitive bases hacked out of the jungle, carrying supplies and troops with a speed and mobility which would have been impossible on the ground, where the terrain was difficult and tracks few.

The fixed-wing peak strength was reached in late 1956, at the time of the Anglo-French intervention in Egypt, when 199 Hawker Sea Hawks, Westland Wyverns, De Havilland Sea Venoms, Fairey Gannets and Douglas Skyraiders were serving in front-line squadrons. Five years later, these aircraft had gone, replaced by Supermarine Scimitars in the day fighter and strike roles, the De Havilland Sea Vixen night fighter and the Fairey Gannet airborne early warning aircraft. In 1963, the first operational Hawker Siddeley Buccaneer squadron joined the fleet and the Scimitar was thereafter progressively retired. No suitable British-built replacement was procured for the Sea Vixen and in 1968 the McDonnell-Douglas F-4K Phantom was placed in service, subsequently embarking with 892 Squadron in HMS *Ark Royal*.

Although it had been intended that the Royal Navy's shipborne aircraft should be a rotary-wing force by the end of the present decade, the decision to buy the Hawker Siddeley Sea Harrier vertical/short take-off and landing (V/STOL) strike fighters and to proceed with the construction of the *Invincible* class anti-submarine cruisers means that the fleet will be able to take its own 'organic' air defence force to sea until the end of the century at least. At the same time, the helicopter will continue to be the numerically most important aircraft afloat: today almost all surface warships and Royal Fleet Auxiliaries are capable of operating A/S helicopters.

The Fleet Air Arm is as important today as it was in 1939 and the personnel and aircraft are fully capable of meeting the many and varied needs of the Fleet in both peace and war.

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ABOVE (left): *A Lynx of 700L Squadron at RNAS at Yeovilton in Somerset where the Fleet Air Arm Museum is situated. Here the history of the Royal Naval Air Service takes visible form in a display of aircraft, equipment and mementoes. Some of the aircraft on view are regularly flown. These include the legendary Swordfish. The Museum is open to the public 10.00 to 17.30 Monday to Saturday; 12.30 to 17.30 Sunday.* (right): *A Sea King over HMS* Ark Royal.

The Royal Marines

For centuries sea power has enabled the United Kingdom to protect her interests all over the world. An essential element of that sea power has been the ability to extend influence ashore by the landing of military forces.

The Royal Marines derive from the Duke of York and Albany's Maritime Regiment of Foot, otherwise known as the Admiral's Regiment, which was formed in 1664, and the traditional role of the Corps has been to provide soldiers for service with the Royal Navy. Its motto *Per Mare Per Terram*, 'By sea and by land', accurately describes its role.

Originally largely recruited from the trained bands of the City of London, the Corps today is proud of the privilege of marching through the City with colours flying, drums beating and bayonets fixed, an honour enjoyed by very few other regiments. Since 1664 the history of the Corps can be traced through successive regiments of marines, raised at the outbreak of a war and disbanded again each time peace returned, until early in 1775, in the days preceding the outbreak of the Seven Years War, the Corps was permanently established under the control of the Board of Admiralty, and since then it has continued to provide a military force as an integral part of the Royal Navy.

During the French wars the 'soldiers of the sea' were present at every naval battle—nearly 1,000 officers and men of the Corps were at Trafalgar—whilst they also gained much experience and distinction in innumerable raiding and other amphibious operations. In 1802, at the end of the French Revolutionary War, and largely due to their great supporter Admiral the Earl St Vincent, the services of the Corps were rewarded by the granting of the title 'Royal'.

Soon afterwards, in 1804, artillery companies were added and later, when small-arms men no longer had a part to play in sea warfare, all marines were trained to man a portion of the armament of the ships in which they served. This gunnery role became a traditional duty of the Corps almost. Nevertheless Royal Marine battalions served in the Crimea, China and Japan, West Africa, Egypt and the Sudan, whilst marines formed part of the naval brigades during the Indian Mutiny, in Abyssinia, and South Africa; and detachments served ashore in Malaya, New Zealand and Canada.

In the early years of the 20th century, sea-going service remained the main commitment of the Corps, but the war of 1914 soon saw the provision of battalions once again. A brigade was landed ashore in Belgium within days of war being declared and this same formation landed at Gallipoli with the Royal Naval Division in 1915, and later, reduced to two battalions, served on the Western Front. Meanwhile the Royal Marine Artillery provided not only howitzer and anti-aircraft brigades but also a heavy siege train in France and Flanders, and an artillery brigade in East Africa.

After World War I sea-service became once more the main duty of the Corps. In 1923 the two branches, the RM Artillery and RM Light Infantry, were amalgamated under the old title, 'The Royal Marines'.

World War II found the Corps being called upon to perform a whole range of new tasks—complete formations for the

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As the two photographs on this page show, 'Over the Sea and Under the Sea' could justly be added to the Corps motto. (above): *A detachment of Royal Marines leaving from Wessex helicopters of the commando ship, HMS Bulwark, during an exercise in Cyprus.* (right): *Royal Marine commandos embarking on a submarine after an exciting sortie ashore.*

defence of naval bases overseas, providing crews for landing craft and men for beach-control parties, armoured units for close support on the beaches—all these in addition to the traditional role of furnishing detachments for HM ships and the familiar tasks of forming battalions, siege regiments and anti-aircraft units. New roles were developed and three remain among their post-war ones—commandos, landing craft and swimmer canoeists. The capture of Walcheren in 1944 demonstrated the versatility of the Royal Marines, when their Commandos landed from craft manned by Royal Marines and supported by their comrades manning the guns of the bombarding ships.

The Corps Role Today

The role of the Royal Marines in 1977 continues to be that of the United Kingdom's specialist sea-soldiers: the military arm of the Royal Navy. However, over the years, the tasks of the Royal Marines have changed to meet national requirements and the Defence Review of 1974 confirmed the major role of the Corps as being on NATO's northern flank, in Norway. The northern flank reinforcement role means that Royal Marines must train to fight in and be equipped for the harsh Arctic environment, including extreme winter conditions. 45 Commando Group has shown the way and has been fully Arctic-trained for some five years. Other Royal Marines units started their training in Norway in January 1977.

The primary skill of every Royal Marine is to be a commando, but the Corps also trains a wide range of experts. These include specialists in mortars, anti-tank guided weapons and anti-tank guns, as well as signallers, assault engineers, clerks, cooks, carpenters, metalsmiths, vehicle mechanics and drivers. The Royal Marines also provide landing-craft crews and a Special Boat Squadron. The Special Boat Squadron men, called swimmer canoeists, are frogmen, canoeists and parachutists who are trained to land unseen on an enemy coast to carry out clandestine operations. They often go on ahead of the main force either to mark a landing zone for a wave of troop-carrying helicopters, to gather intelligence on the latest enemy positions, or to mark a beach. They could also be used to raid behind enemy lines.

As the landing-force element of the United Kingdom Amphibious Force, the Royal Marines can expect to operate alongside their counterparts in the other NATO marine corps. Co-operation and joint exercising is frequently practised with these other marine corps and in particular there has been a considerable amount of standardisation of equipment with the Royal Netherlands Marine Corps.

Landing operations are carried out from specialist amphibious ships equipped with landing craft, which can also carry troop-lift helicopters. The speed of helicopter operations and the distances over which a force may be dispersed demand high standards of training and individual expertise. Operations inside the Arctic circle in mid-winter, for example, require specialist knowledge and equipment. The battle is as much against the elements as it is against the enemy, when to survive in temperatures of 40 degrees below freezing is an art in itself. The specialist amphibious shipping is augmented by logistic landing ships and possibly by merchant ships, particularly of the roll-on roll-off type. To support the Royal Marines ashore there is a specially trained Royal Artillery Regiment and a Royal Engineers Squadron.

The Royal Marines continue with their longest standing role of providing Marine detachments in ships of the fleet. Some 10 frigates, deployed world-wide, have detachments whose tasks range from shipboard employment to providing a landing force for operations ashore. At the scene of a natural disaster, a detachment could be among the first British members of an assistance force. There is a Royal Marines detachment in HMS *Endurance*, the Antarctic ice patrol ship, and a larger detachment is based ashore in the Falkland Islands.

The Royal Marines Band Service has its origins as long ago as 1767. Since then it has provided bands for both the Royal Navy and Royal Marines ashore and afloat. At the Royal Marines School of Music at Deal, Kent, musicians are taught both a band and an orchestral instrument, and those who aim for leading positions in the Band Service

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THIS PAGE (top): *The Royal Marines School of Music band at the RM Depot at Deal on Corps Remembrance Day.* (bottom): *A RM landing craft in Arctic waters.*

FACING PAGE (top left): *Marines race ashore from a landing craft during a NATO exercise.* (top right): *Inspection by the Captain General of the Corps, HRH The Duke of Edinburgh.* (bottom left): *Public relations in Northern Ireland: a more relaxed moment for a Royal Marine patrol in the troubled province.* (bottom right): *Snow patrol, a scene during an exercise in Norway.*

are taught subjects including harmony, orchestration, the history of music and conducting. Many musicians, as a result of this experience, are able to take rewarding employment in the world of music when they leave the service.

Since the end of World War II Royal Marines have taken part in almost every campaign, including those in Malaya, Korea, Cyprus, Borneo and Aden. Currently, Royal Marines Commando and landingcraft crews are involved in Northern Ireland alongside the Army. 41 Commando Royal Marines was for a time part of the United Nations Peace-Keeping Force in Cyprus in 1974. As a result of its work the unit was awarded the Wilkinson Sword, which is annually presented to the ship or unit adjudged to have made the most valuable contribution towards establishing good and friendly relations with the inhabitants of any territory within or outside the United Kingdom. 40 Commando Royal Marines has been awarded the Sword twice, for community work in Sarawak in 1966 and in Belfast in 1972.

The strength of the Royal Marines lies in their adaptability and in the high professional standards achieved during their thorough and demanding training. The Corps knows that the efficiency of the whole always depends upon the quality and character of each individual officer, warrant officer, non-commissioned officer and marine, and prides itself on the excellent relationships that exist between ranks.

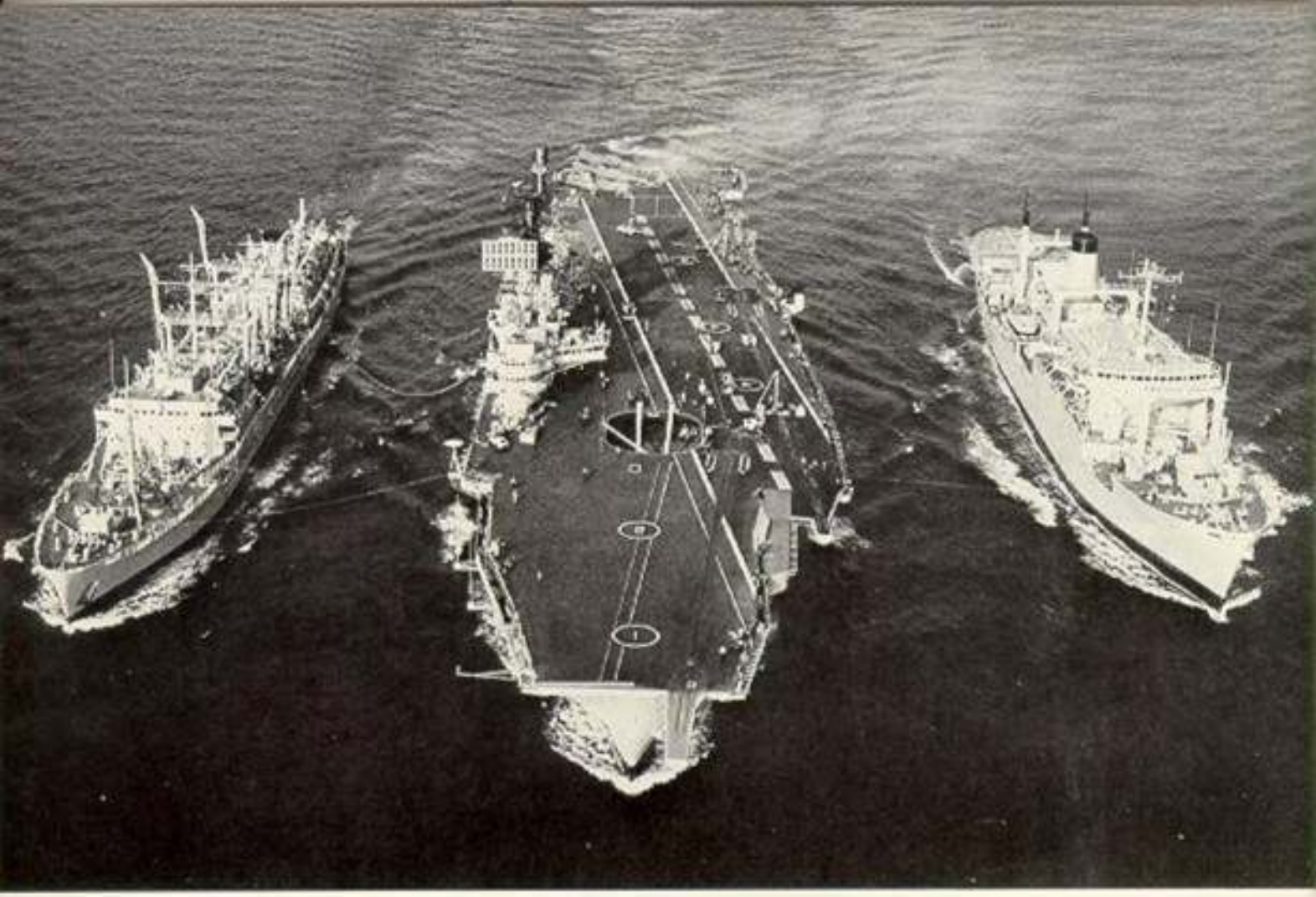
The Royal Family and the Corps

When King George VI died, the Corps lost a much loved Captain-General, a title he assumed in 1948 before which he had been Colonel-in-Chief. The new Queen's husband had been a professional naval officer for many years prior to the accession in 1952. It therefore seemed highly appropriate that His Royal Highness the Duke of Edinburgh should become the new Captain-General, which he did in 1953. Since then Prince Philip has shown tremendous interest in the Royal Marines and is by now as well versed as any in the Corps of which he is head. The Royal Marines owe him a great debt for his inspiration and guidance over the last 24 years.

HM Royal Yacht *Britannia* always embarks a Royal Marines band from Eastney Barracks, Portsmouth, whenever Her Majesty or members of her family are aboard. This is perhaps the most personal service that the Corps renders Her Majesty and one which, since Queen Victoria, successive sovereigns have been pleased to accept.

HRH the Prince of Wales has served as a naval pilot in 848 Naval Air Squadron and as such he has been embarked in Commando and assault ships of the Fleet, landing Royal Marines Commandos on exercises in Canada and elsewhere. He thus has an intimate knowledge of the modern techniques of the Marines' amphibious role. For this modern role the Corps is much indebted to his great uncle, Admiral of the Fleet the Earl Mountbatten of Burma, who as Chief of Combined Operations in World War II did much to ensure that Royal Marines were included in the Commandos. Later, as First Sea Lord and then as Chief of Defence Staff, Lord Mountbatten guided the Corps into its latest amphibious role, landing by helicopter from Commando and assault ships. After ceasing active service in the Royal Navy in 1965, Lord Mountbatten was appointed Life Colonel Commandant Royal Marines, a rare honour for one who has not actually served in the Corps.

The Royal Marines look forward to many further years of loyal service to Her Majesty and with the Duke of Edinburgh as their Captain-General.



The Royal Fleet Auxiliary Service

The Royal Fleet Auxiliary Service, usually known as the RFA, is the branch of the RN Supply and Transport Service which provides a logistic support force for the Navy in the form of ships that carry and provide to the fleet at sea its requirements of fuel, food, ammunition and stores of all kinds: in addition it carries out other support tasks for the armed services. The ships are painted grey but they are not warships nor are they manned by naval personnel. They carry their own distinctive blue ensign with a vertical anchor in gold in the fly. Nearly all their officers and petty officers and a proportion of the ratings are career service personnel who remain with the RFA throughout their sea-going careers. The remainder are drawn from the Merchant Navy and all are on MN pay and conditions.

RFAs normally form part of naval task groups and accompany the warships on their normal peacetime deployment and whenever emergencies occur. The present-day RFA comprises 34 ships, half of which are tankers and the remainder stores support ships, store carriers, logistic landing ships and a helicopter training ship.

Tankers are of two main categories: fleet tankers and freighting tankers. A fleet tanker can carry four or five different grades of oil required by warships and naval aircraft, and can issue them simultaneously. She can refuel up to three other ships at a time, one either side at a distance of between 80 and 150 feet with the third steaming astern. The receiving ships come up and take position on the tanker but in the case of an aircraft carrier or other large ship the tanker will take station. A line is then fired across and with this the hoses are hauled over, to be coupled into the receiving ship's system. As the ships steam along, rolling in the seaway, the distance between them is continually changing and automatic tension winches pay out or take up the slack in the hoses as necessary. There are six large fleet tankers (*Olmeda* and *Tide* classes) and five smaller ships of the *Rover* class. There are five freighting tankers, the *Leaf* class, and a larger ship *Dewdale*, which collect oil from refineries and transport it to naval fuel depots. They also carry fuel to replenish fleet tankers. This allows the latter to remain longer in company with the naval force of which they form part.

Store carriers transport cargo for the forces from one place to another. There are three of these, *Hebe* and *Bacchus*, which carry general cargo for all three services, and the *Empire Gull*, which is used for carrying Army vehicles.

Stores support ships are in effect sea-going warehouses which carry ammunition, food, stores and other commodities required by the Navy. There are seven of these, three of the *Nese* class and two each of the *Resource* and *Regent* classes. These ships can replenish two ships under way simultaneously, one either side, using a technique somewhat similar to the fleet tankers'. In addition, by using helicopters, they can supply stores to other ships steaming considerable distances away by a procedure known as vertical replenishment. Stores support ships will carry as many as 40,000 different items for re-supply to the warships and up to 60 loads an hour can be passed across. The stores organisation on board these ships is looked after by civilian staff of the Royal Naval Supply and Transport Service.

The logistic ships are used to carry troops and their vehicles and equipment; they are military 'car ferries' and have bow and stern doors through which tanks and lorries can be driven on board and off. With their shallow draught these ships can, if necessary, be 'beached' to enable unloading to take place direct over the beaches. These six ships are named after knights of the Round Table of King Arthur.

The main function of the helicopter ship RFA *Engadine* is to enable naval helicopter pilots to become proficient at deck landing in all winds and weather, by night as well as day. This ship is particularly interesting because in addition to her RFA crew, the aviation side

of things is looked after by RN officers and men so she is truly a 'mixed' ship—but very efficient.

In addition to *Engadine*, all the newer ships—over half of the fleet—have flight-decks and refuelling equipment for helicopters. Some ships also have hangars and helicopter-maintenance facilities which are used by Royal Navy helicopters as required.

Underway replenishment is an art which has steadily developed with improved gear and methods. The procedure was given considerable impetus during World War II, when the Royal Navy deployed in force to the Pacific in 1944/45, and later during the Korean War, when warships had to operate at long distances from their main support bases. Transfer of bulk ammunition and other heavy cargo in large quantities continued to develop in the decade following World War II, and in the sixties, after the bringing into service of a number of purpose-designed stores support ships. At the present time developments of equipment is going on to improve the safety of loads in transit, especially in rough weather; for it is no use transferring costly and sophisticated equipment if it gets damaged in the process!

In addition to supporting our own warships, the RFA is well used to replenishing, with both fuel and stores, the warships of Commonwealth and Allied navies and they carry the necessary gear for this purpose.

Although underway replenishment is a routine task to warships and RFAs, it is a job demanding precision and skill. Picture two, or three, ships steaming close together in heavy weather at quite fast speeds. A false move could bring disaster. Then imagine this being done in blackout conditions, while the ships are closed up under simulated attack!

The officers and men of the RFA not only have to be trained like the rest of the Merchant Navy in basic ship handling, operation and maintenance. They must also become skilled in working with warships and helicopters, in evolutions such as underway replenishment and tactical manoeuvring and, when they are in the logistic landing ships, they have to work with the Army too. So it is a demanding job requiring a high level of skill and proficiency. The keynote is training and, like the Navy with whom it trains, the RFA puts a good deal of emphasis on this.

The RFA has a cadet entry scheme for boys aged from 16½ years who wish to make the sea their career as deck and engineer officers. It also takes in more marine officers who have served with other companies. In addition it has radio, electrical and purser officers. With the advanced electronic equipment fitted in RFAs, radio officers get a considerably more intensive experience than their counterparts in merchant ships. Electrical officers, too, look after the wide range of electrics in RFAs, while the pursers are responsible for catering, accounts, and other administrative work on board. All officers are given courses to enable them to learn their various jobs and develop their skills.

The RFA is a service with high standards. It provides a job of wide variety and it is full of interest. Its proud boast is that the initials stand for 'Ready for Anything'.

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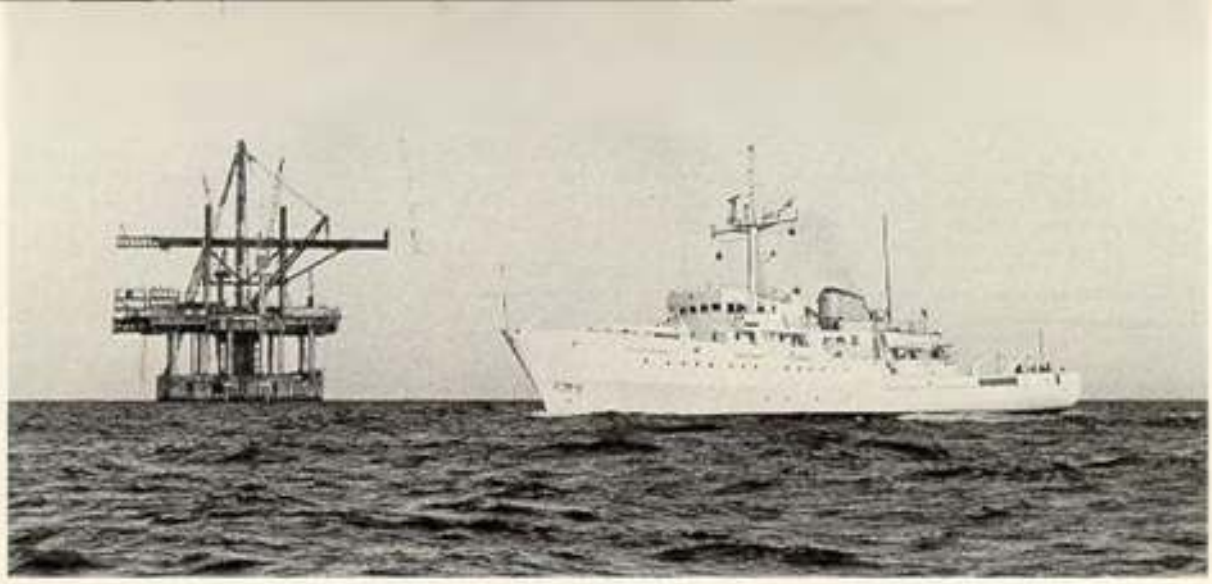
FACING PAGE: *HMS Ark Royal being serviced by two RFA ships: on the starboard side (left of the picture) by a Tide class fleet tanker; on the port side by RFA Lyness, a Ness class store support ship.*

THIS PAGE (top): *RFA Regent, a fleet replenishment ship.* (centre): *RFA Green Rover, a small fleet tanker.* (bottom): *RFA Sir Bedivere, a landing ship logistic. She is attended by the Dog class tug, Spaniel, towing a fuel lighter. A hovercraft is standing by Bedivere's open bow doors.*



The Hydrographic Service

One of the oldest and smallest departments of the Ministry of Defence (Navy) is that of the Hydrographer of the Navy. Established on 12 August 1795, the Hydrographic Department is responsible for producing and updating the nautical charts and navigational publications not only for the Royal Navy, but also for all other Government departments, as well as for the Merchant Navy, fishermen, yachtsmen, and all those who are concerned with the exploitation of the sea bed.

The present Hydrographer of the Navy—Rear-Admiral D. W. Hatlam, OBE, FRICS—is the 21st holder of the office and he is head of a branch with almost 1,000 civilian and naval staff at Taunton, and only slightly fewer in the 13 HM Surveying Ships. The 3,500 individual charts, which make up a homogeneous world-wide series, and the navigational publications which the department produces are available throughout the world.

To understand how this sizeable business has grown, one must go back a long way. Ever since man first went to sea, mariners have kept careful records in order to profit from their experiences and to be able to return safely. Early charts of British waters were privately produced copies of charts made by the Dutchman Waghenaer, but in the late 17th century various maritime bodies, such as Trinity House, persuaded Charles II to appoint Captain Greenville Collins to conduct a systematic survey of the coastline. After 10 years, his results were published in *Great Britain's Coasting Pilot*, which was very accurate indeed considering the equipment and time available. In 1751, the Admiralty appointed a civilian surveyor, Murdoch Mackenzie, to make charts of the west coasts of Britain and Ireland to add to his earlier works in the Orkneys. Captain Cook's first hydrographic survey enabled the British forces to navigate parts of the St Lawrence river which the French regarded as unnavigable, and led to the capture of Quebec in 1759. Captain Cook then carried out detailed surveys off Newfoundland before his more famous voyages to the Pacific.

No Government money, however, was spent in publishing the results of these surveys. Charts of varying accuracy were sold by private booksellers who catered chiefly for merchant ships. Captains of men-of-war had to buy what they could afford, and many were forced to use very inadequate versions, which usually made up in artistry what they lacked in accuracy, with illustrations of cherubs, whales and animals.

Complaints from HM Fleet about the need for a hydrographic department had begun in 1740 at least, and it is probable that George III had planned to appoint Captain Cook as the first Hydrographer of the Navy had he returned from his fatal Pacific voyage. In the early Napoleonic Wars, losses of British warships by shipwreck because of inadequate charts were greater than those inflicted by the enemy, and Alexander Dalrymple was eventually appointed as the first Hydrographer of the Navy. He was then aged 59 and already hydrographer to the East India Company in 1795. The only civilian to hold the post, he set out to sort the mass of unpublished data, with a salary for himself and his staff of only £650 a year.

Although Dalrymple succeeded in cataloguing and co-ordinating a prodigious amount of data, he refused to use captured French data until this was published by the French Hydrographic Office. A Charting Committee, set up in 1808 to advise on the selection of charts needed by the Navy, recommended the issue of folios of selected charts to each warship, and when Dalrymple disagreed, he was asked by the Admiralty to retire and died three weeks later—it was said of a broken heart.

Captain Hurd, who had been on the Charting Committee, was then appointed and, within a year, had issued the first 113 chart folios to the Fleet. He was a tireless organiser and, despite the reduction of the Fleet after the Napoleonic wars, he got approval to man special warships with surveying officers. By 1820, there were 12 Surveying Ships with surveying specialists in command. When Hurd died in office in 1824, he had laid the firm foundations for the present pre-eminence of the department in the international hydrographic field.

For the next 90 years the Navy's surveying ships—then, as now, with hulls painted white and with buff-painted funnels and unarmed—literally surveyed the world. Wherever British trade could be developed, naval survey ships went to find the safest routes. Few other countries had the ability or knowledge, and everywhere British surveying ships and their crews were welcomed. The result was that many coastal charts—in China, Japan, Australasia, the Americas, Africa, the Pacific and the Caribbean—to this day have traces of their incredible efforts.

Throughout this *pax Britannica* era, however, the draught of ships remained fairly constant; the method of sounding remained the traditional one of using a lead weight on a marked line. With so much of the ocean to be explored, waters regarded as only slightly deeper than the deepest vessel expected to use the area were not fully investigated. The time and effort needed to lower a hand lead-line in deep water were considerable but, although each cast of the lead only gave the depth of the few inches of the sea bed actually struck by the lead, the experience of the surveyors enabled them to locate a much larger number of hidden pinnacles than the law of averages would suggest.

The requirement to lay submarine telephone cables across the oceans led to the development of deep-sea sounding machines; HMS *Challenger*'s four-year circumnavigation of the world from 1873 to 1877, under the guidance of the Royal Society, paved the way for much further

co-operative civilian scientific work. By the outbreak of World War I, the introduction of submarines had led to new needs for better delineation of the seabed topography, but it was not until the late 1930s that the surveying scene was dramatically changed by the introduction of the echo-sounding machine. This equipment displays on a paper trace a continuous profile of the sea bed beneath the track of a ship. Sound transmitted from the ship's keel is reflected from the sea bed and received back in the ship. As the approximate speed of sound in water is known, by measuring the time taken for the double journey the depth can be calculated.

The position of the ship as it progressed along its track could still be fixed accurately only by means of sextant angles between marks at accurately positioned points ashore or between beacons fixed in shallow water. Such work was thus confined to good weather and to daylight hours, but the increased accuracy of depth was sufficient to keep pace with the gradual increase of draught of both merchant and naval ships, which in 1953 was still little more than it had been in 1853.

The development of radar and electronic distance-measuring equipment during World War II led to the second major improvement in marine navigation and hydrographic activities. Radar first became available for navigational use about 25 years ago, but it was not until 1957 that the Two Range Decca equipment was fitted to two British survey ships. This consisted of a master station carried in the ship which controlled two 'slave' stations ashore at suitably selected positions and the system enabled the ship's position to be accurately and continuously plotted when up to 120 miles from the land and regardless of visibility or daylight hours.

The foundations of the present surveying fleet had been laid shortly after World War II, when four frigate hulls were converted and commissioned as HM Survey Ships *Dampier*, *Dalrymple*, *Owen* and *Cook*. HMS *Vidal*—the first HM ship specifically designed and built as a surveying ship—was commissioned in 1954, when four Survey Ships and five surveying motor launches were employed in UK waters and three survey ships were employed overseas. The first of a new class of inshore survey craft, HMS *Echo*, was commissioned in 1958, and her two sister ships—HMS *Hydra* and HMS *Enterprise*—in 1959; all three are still giving excellent service together, as the Inshore Survey Squadron, based in Chatham.

The four ships of the *Dampier* class and the four pre-war converted minesweepers were all nearing the end of their useful life by the 1960s. Three purpose-built ocean survey ships were laid down in 1964, when orders were also placed for four coastal survey vessels and for the conversion of two inshore minesweepers to replace the last of the two wartime surveying motor launches. This massive and timely replacement of the surveying fleet was partly due to the impending introduction of the powerful deep-diving nuclear submarines and partly to the anticipated increase in draught of the world's mercantile fleet.

So long as ships remained of roughly the same draught and kept to their traditional routes, the risk of stranding on uncharted dangers was acceptably small. However, by the 1950s the maximum draughts of ships had increased from about 13 metres to over 26 metres; whilst today concrete oil- and gas-production platforms have to be towed to their off-shore sites with draughts of over 95 metres. It is quite unacceptable to tow these through waters which have never been comprehensively surveyed, but less than a quarter of the world's continental shelf has been surveyed by modern echo-sounders. The hydrographic services of the world have to ensure the safety of such platforms and of the 500 or so vessels of over 100,000 dwt which now carry bulk cargoes of petroleum and other products, close to most coasts of the world. HM Surveying Ships can no longer meet this responsibility alone, but 17 maritime countries now belong to the International Hydrographic Organisation, a co-ordinating body established in 1922 to encourage the interchange of navigational and surveying data between nations. Not all the 47 countries can carry out their own hydrographic surveys or print their own charts. There are still many former Commonwealth countries who rely upon the Hydrographic Department to undertake their hydrographic tasks. The need for this work to continue was acknowledged in October 1976 when part of the cost of HM Surveying Fleet in the year 1977/78 was met from UK overseas aid funds, whilst its importance to the national energy programme was recognised by a contribution from the Department of Energy.

Work in support of trade must also continue. Of the 14,000 wrecks lying in UK coastal waters, the exact position of some 11,000 is uncertain and the least depth of more than 12,500 is unknown. In 1976, over 100 new wrecks were found, including one rising more than 90 feet from the sea bed close to the route taken earlier in the year by the first concrete production platform to leave the Clyde. Since the large VLCCs are known to operate with less than the height of a tall man between their keels and the charted sea bed, every bump and hollow, rock and wreck, down to a depth of 90 feet must be located and heighted accurately. Sonar—or horizontal sound transmission—is now available to search between the lines followed by each surveying ship as it methodically covers its area—like a man mowing a lawn in parallel lines.

This painstaking work—carried out for more than 5,000 hours per year by each ship—may appear boring or dull, but the knowledge that every new danger found may save some ship from stranding motivates both the specialist surveyors and general service ratings serving in HM Surveying Ships.

The same sense of dedication to accuracy is felt ashore, where the 1,000 staff are devoted to transforming the mass of data received into a homogeneous format of most value to the various users. Apart from the work of HM Surveying Ships, some 2,500 foreign new charts and new editions are received annually. Every document is indexed and examined for significant alterations. Details of urgent changes are signalled immediately to ships at sea through the Admiralty's Radio Navigational Warning service—now linked to an international system. Important changes of less urgency are included in the Admiralty series of Notices to Mariners which are issued weekly. Every correction on the stock of some 1,500,000 copies of charts is made by hand, so that every chart, when sold, is corrected to the day of issue. Orders are received from all over the world and every attempt is made to dispatch each order within 24 hours of receipt. Such is the dedication of the whole staff—from the youngest sailor in the furthest deployed survey ship to the newest draughtsman at Taunton—that the proud boast may be earned now, as it could in the last century, that every mariner 'can put his trust in God and the Admiralty chart.'

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FACING PAGE: *HMS Fox passing a partly completed offshore oil installation in the Frigg field in the North Sea. The coastal survey ship was on her way to survey an oil rig 'come-out' route.* RIGHT: *Lowering a temperature/depth/salinity probe from HMS Hecate.*

The Women's Royal Naval Service

This year, as well as the Queen's Silver Jubilee, the Women's Services celebrate their Diamond Anniversary.

The Women's Royal Naval Service was formed in 1917 to replace men required for active service. Under the directorship of Dame Katharine Furse and in the two years before it was disbanded, it grew to approximately 7,000, the women in the service having proved, to the satisfaction of the Navy, their ability not only to carry out domestic and clerical duties, but such work as boats' crew and wireless telegraphist.

In 1919 the service was completely disbanded, although many of the women who had served kept in touch through the Association of Wrens, and from time to time raised the question of the formation of Women's Services' Reserves. A voluntary training course for women officers was held in 1937, when a proposal was considered that there should be a united women's service to serve the three services, but in 1938 the Board of Admiralty decided that there was a need for women to assist the Navy, as a separate corps, organised on a civilian basis.

In April 1939, it was announced that the King had given permission for the formation of a corps to be known as the Women's Royal Naval Service, to replace naval officers and men on certain duties in time of war. A total force of about 1,500 was envisaged, to be employed on the duties conventionally applicable to women. Mrs Laughton Mathews, later Dame Vera Laughton Mathews, who had served as a WRNS officer in the 1917–19 period, was chosen as Director, and took up her duties in April 1939.

Until the outbreak of war, recruiting was for WRNS officers and ratings who could live in their own homes and were required to attend a prescribed number of weekly drills at the home ports of Chatham, Portsmouth and Devonport, and also Rosyth. On 3 September 1939, there were some 1,000 such Wrens employed as communicators, writers, motor transport drivers, cooks and stewards. There were also a small number of officers-in-charge and prospective cypher officers.

Permission was then obtained, for which the Director had pressed, to recruit officers and ratings to serve in widely scattered areas throughout the United Kingdom. The demand for mobile WRNS officers and ratings was immediate and continuous. 1941 and 1942 were years of great expansion, both in number of personnel and diversity of duties. Highly skilled categories concerned with the maintenance of aircraft, weapons and small craft were introduced to serve the needs of the growing Fleet Air Arm and Combined Operations, all a very far cry from the duties conventionally undertaken by women.

In January 1941, the first WRNS overseas draft, consisting of 20 chief Wren wireless telegraphist operators and one second officer, sailed for Singapore. In the same year service for WRNS officers and ratings opened in Washington with the British Admiralty Delegation, and in Gibraltar. Tragedy overtook the first WRNS draft to Gibraltar as a small merchant vessel, SS *Aguila*, carrying 12 cypher officers and 10 chief Wren W/T operators and a nursing sister of the QARNNS, was torpedoed and the entire draft lost. Replacement volunteers were immediately forthcoming and sailed for Gibraltar the following month. Many other members of the service lost their lives at sea, and as the result of enemy action in the United Kingdom.

Early 1942 saw the first of many drafts to Alexandria and subsequently WRNS units throughout the Middle East and Far Eastern areas. In 1943 and 1944 the series of great conferences between the heads of Allied nations took place, at which WRNS officers served with distinction. Cypher officers had the enviable privilege, together with the WRNS coder ratings, of being the first women to serve afloat in large troop-carrying ships. In 1944, the peak

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THIS PAGE: *A Wren air mechanic towing a Wessex helicopter at RNAS Culdrose in Cornwall. Some Wren air mechanics qualify as tractor drivers.*

FACING PAGE (top): *Wren radar plotters at a shore establishment. WRNS officers and ratings are playing an increasingly important part in the wide field of communications.* (bottom): *HRH The Princess Anne, Chief Commandant WRNS at RNAS Yeovilton during a visit in 1976.*

expansion was reached with a total force of 74,620, with 90 rating categories and 58 officer branches.

At the end of the war, the WRNS rapidly reduced in number, but the Navy could not return at once to a peacetime basis and WRNS officers and ratings were still needed. Many volunteered for periods of extended service, and small numbers continued to be recruited on short-term engagements. Dame Jocelyn Woollcombe, who succeeded Dame Vera Laughton Mathews as Director at the end of 1946, guided the transition of the WRNS from a wartime basis, through the demobilisation period, to a permanent status.

On 1 February 1949 the Women's Royal Naval Service—first created to meet the Navy's need in wartime—became an integral and permanent part of the Naval Service. The permanent establishment of the WRNS today is some 270 officers and 2,700 ratings.

Applicants, who must be between 17 and 28 years of age, attend a selection board, which includes an aptitude test and medical examination, and an interview with a WRNS careers officer to discuss the various categories available and those for which they are most suitable. If selected, they attend a four weeks' basic training course, at present at HMS *Dauntless*, the WRNS New Entry Training Establishment near Reading. This includes a two-week probationary period during which the recruit may terminate her service. However, all being well, she enrols on a nine-year notice engagement which requires her to serve a minimum of three years from her 18th birthday or the completion of her specialist training, whichever is the later. Thereafter she has the option of leaving the service having given 18 months' notice or, in due course, of extending her engagement to complete 14 years' and, subsequently, 22 years' service in order to qualify for a pension. All members of the WRNS may take their discharge as a result of marriage. However, many decide to stay in for a time, particularly if their husbands are in the Navy.

On satisfactory completion of the basic training a Wren goes on to her specialist training at a naval school before taking up a job in a complement billet. WRNS ratings help to maintain and repair naval aircraft, drive service vehicles, plan and plot naval, air and sea exercises, prepare meteorological information and evaluate the accuracy of weapon practice. They cook, issue stores, assist the dental surgeons, operate telephone switchboards, help staff communications centres and do much of the Navy's clerical and accounting work.

There are three ways of becoming a WRNS officer. Selection is from ratings already serving, provided they have a minimum of five passes at O level in the GCE (or equivalent) with English Language as one subject. Cadet entry is open to those aged 18½–25 who have obtained at least five passes in GCE, including English Language, two of which must be at 'A' level, and who have the qualities expected of a potential officer. Direct entry is available to those who have a university degree or suitable civilian qualifications and experience. All candidates attend the Admiralty Interview Board at Gosport. The age limits for promotion are between 20 and 29 years.

Candidates who are accepted for the Officers' Training Course go to the Britannia Royal Naval College at Dartmouth for a 13½ weeks' course. On satisfactory completion they are promoted to probationary third officer and enter a seven-year short-service commission, which has an optional break-point at five years. Officers may apply to transfer to permanent commissions.

All officers are trained in both administrative and specialist duties in order to widen the scope of their employment. The specialisations open to WRNS officers are in the secretarial, personnel selection, communications, catering, photographic interpretation, instructional and technical fields.

WRNS officers and ratings serve in most naval and Royal Marine establishments in the United Kingdom, and serve abroad in Malta, Gibraltar, Naples, Portugal, Hong Kong, Oslo and Belgium. Individual officers are in appointments in Paris and the United States of America, whilst individual ratings are serving in Holland, New Zealand, New Delhi, Canada and Penang.

Although the services are exempt from the Sex Discrimination Act, many steps towards closer integration within the Royal Navy are taking place. For example, responsibility for the recruiting, selection and appointment of officers, hitherto controlled by the Director WRNS, has now been passed to the same naval authorities as for the men. Director WRNS has assumed an additional task as the Assistant Director General Naval Personal Services and has been advising on the Navy's future housing policy. The recruiting and drafting of WRNS ratings have also been taken on by the men but, conversely, many naval ratings, mainly in the secretarial branch, find that their 'drafty' is now a first officer WRNS. As RN and WRNS personnel often now attend the same basic and higher training courses they become increasingly interchangeable and job opportunity for the WRNS has widened.

The WRNS Officers' Training Course, which had been at the Royal Naval College, Greenwich, since 1939, moved to the Britannia Royal Naval College, Dartmouth, in September 1976 and the second course of officer cadets has just passed out as probationary third officers. Their course is now designed to give greater weight to the role and organisation of the Royal Navy, the study of British and international affairs and the development of powers of leadership. The aim is to help prepare WRNS officers for greater variety of employment and closer integration within the Royal Navy.

WRNS new-entry training, carried out at HMS *Dauntless* since 1946, will transfer to the West Country in 1980 and the training of all new-entry naval and WRNS ratings will then be carried out in the same place, namely at HMS *Raleigh* in Torpoint.

This year, for the first time, members of the WRNS will become subject to the Naval Discipline Act, thereby accepting commitment with equal opportunity.

Although celebrating its 60th anniversary the Women's Royal Naval Service is proud of its young and modern image and it was with great delight that the news of the appointment in 1974 of Princess Anne as Chief Commandant was received. The post had remained vacant since the tragic death of Princess Marina in 1968.

The service has come a long way since its formation but remembers with pride the standards, traditions, and the spirit of those early Wrens which have made the Women's Royal Naval Service what it is today, an increasingly integrated part of the Royal Navy.

The Royal Naval Reserve

The Royal Naval Reserve has a proud tradition dating from 1859. It was then that a Reserve Force was first established by Act of Parliament for men of the Mercantile Marine. Twelve years later, the RN Artillery Volunteers, consisting of yachtsmen, members of rowing clubs and men with nautical connections, were raised. They were expected to make themselves proficient in gunnery—but sea training was not compulsory.

After 20 years, the Artillery Volunteers were disbanded because it was felt that their training was not concerned enough with the sea to make it of real value. Then in 1903, the gap was filled by the birth of the Royal Naval Volunteer Reserve (RNVR).

At the outbreak of World War I, the Admiralty, thanks to the training provided in the RNVR, was able to call on a keen well-trained body of volunteers who served with great distinction throughout the Navy. By the end of the war this force totalled 70,000 officers and ratings, and between them they won thousands of honours, including several Victoria Crosses.

In 1936, the RN Supplementary Reserve was formed of yachtsmen and 'other gentlemen of nautical experience' who had no peace-time commitments but who volunteered to be commissioned in the Royal Navy in the event of war. When Word War II broke out the Admiralty had a large body of volunteers to call on and at one time there were over 40,000 officers in the Naval Service holding RNVR commissions.

Reservists served during World War II, in all types of ships from aircraft carriers to coastal craft and in naval shore establishments throughout the world. Officers commanded destroyers, frigates and submarines, and most of the commanding officers of Coastal Forces were RNVR officers, while Reserve ratings served as seamen, electricians, engineers, signalmen, and wireless operators. Once again they fought with distinction, winning further honours and decorations for service with the Royal Navy and the Fleet Air Arm.

In recognition of the way officers of the Reserve had answered every call made on them, King George VI, in 1951, approved the abolition of the wavy stripes on their uniform. Up to that time the gold braid on their cuffs was sewn on in waves with the curl a distinctive square shape. This feature caused the RNVR to be known as 'The Wavy Navy'. Now the only distinguishing mark between the reservist and his brother officer in the Royal Navy is a small golden 'R' in the curl of the top stripe on each sleeve.

As a part of the move towards closer integration with the Royal Navy, the modern Naval Reserve, which is an amalgamation of the former RNR and RNVR, underwent a fundamental review in 1974/75. As a result the RNR came under the command and control of the Commander-in-Chief Naval Home Command, and on 1 January 1976 the Women's Royal Naval Reserve was fully integrated with the Royal Naval Reserve.

The RNR today is trained for many roles. There are 440 professional merchant navy officers who hold RNR commissions and who would provide essential knowledge of naval operations

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ABOVE: Barbara and Dennis, two of the 5,000 people in the United Kingdom who may be said to be leading double lives. She is a trainee legal executive, he is an agricultural mechanic. Both are also reservists serving with the Sussex division of the RNR. Barbara plays an important part in communications on shore; Dennis goes to sea in the Duchess's minesweeper.

FACING PAGE (top): The RNR's own fleet—the 10th Mine Countermeasures Squadron which frequently takes part in NATO exercises in the Mediterranean and the seas of Northern Europe. (below): A Bofors gun crew aboard a RNR mine countermeasures ship.