



The Sheffield Flight

Every major warship in the Royal Navy today has its own helicopter flight and HMS SHEFFIELD will be no exception.

The flight has a Lynx Mark 3 helicopter which is one of the most versatile rotary wing aircraft in the world, capable of lifting up to 1500 kilograms of payload. Its primary role is for anti-submarine attack but can also be used for anti-shipping strike, troop carrying and support, search and rescue, personal and stores transfer, and intelligence gathering. It was designed specifically for operation from ships with a robust undercarriage and the Harpoon deck lock system to allow operation in very severe weather conditions. The aircraft and its operating system conclusively

proved its worth during the Falklands campaign when a number of enemy vessels were sunk by Lynx deployed within the Task Force.

The Flight comprises two aircrew officers and a maintenance team of seven ratings. They are trained at RNAS PORTLAND and join the ship as a fully worked up unit from 815 Naval Air Squadron. Given the excellent facilities onboard HMS SHEFFIELD they are able to carry out all but the most major maintenance on the aircraft without outside help. Ensuring that the aircraft is always operationally ready is their primary task onboard, but as part of the Operations Department they involve themselves in most ship activities when embarked.



Lynx helicopter carrying Sea SKVA air-to-surface missile



The Weapon Engineering Department

In 1873 the Gunnery Branch charged certain Artificers with repairing gun battery wires and maintaining torpedo firing circuits. Then in 1881 selected Engine Room Artificers were given electrical instruction and a year later the Torpedomen electricians were given formal courses. This status quo, with responsibility for weapon maintenance split between the Gunners, the Torpedo Department and the Marine Engineering Department, lasted until 1946 when the Electrical Branch was formed. The Weapon Engineering Department as we know it today was formed in 1978 when the MEO resumed responsibility for electrical generation.

The WEs now maintain and support all missile and gun systems and allied electronic equipments, Communications, Radars, Torpedoes, Sonars, Computers, Electronic Warfare and Surveillance Systems and Gyros. From this it is obvious that close liaison with the Operations Department is essential and 'Teamwork' is the keyword in modern warships.

There is a high degree of automation in SHEFFIELD's weapon fit where systems regularly work in the 'hands off' mode. Virtually all systems are digitally controlled by their own computers or micro processors, in fact SHEFFIELD has

over 30 computers.

All this sophisticated equipment is maintained by a relatively small Department of 3 Officers, 18 Senior Ratings, 22 Junior Ratings and 3 Artificer Apprentices. Consequently Junior Ratings are entrusted with maintenance tasks which would in the past have been more appropriate to Artificer Senior Ratings. This means that every man is an essential member of the team.

Most Senior Ratings joined SHEFFIELD at Swan Hunter Shipbuilders as their equipment completed installation and then assisted with setting-to-work. A close liaison was built up with the Shipbuilders, the Overseers and MOD(N) technicians which laid the foundation for an intensive Sea Acceptance Trials period which will run on for some time after Commissioning.

CACS maintainer at work





The Marine Engineering Department

The Marine Engineering Department in a modern warship is very much a service industry, providing all the necessary support facilities to enable the ship to carry out her operational tasks for long periods anywhere in the world.

In addition to the 2 Olympus and 2 Tyne gas turbines that provide up to 50,000 horsepower to propel the ship by twin propellers at up to 30 knots, 4 MW of electricity are generated by diesel driven generators and distributed throughout the ship at a variety of voltages and frequencies. Weapon services (chilled water, compressed air hydraulics and electrical power), hotel services (hot and cold fresh water, lighting, heating, ventilation, air conditioning, galley appliances, laundry equipment and sewage treatment) and emergency services (firefighting, pumping and damage control) complete the wide range of equipment that 'belongs' to the Marine Engineer Officer.

Machinery and system operation is directed from the Ship Control Centre where 4 men under the charge of a Chief Petty Officer ensure that services are maintained around the clock. Their task is considerably eased by modern electronic systems that utilise digital techniques and extensive use of integrated circuits for the control of

machinery, surveillance and data logging of over 400 parameters throughout the ship and extensive fault diagnosis and performance monitoring facilities.

The day to day running of the Department is delegated to the Deputy Marine Engineer Officer and 2 Warrant Officers/Charge Chief Petty Officers with a staff of nearly 50 skilled artificers and semi-skilled mechanics to conduct all the necessary maintenance and operation to ensure a high degree of availability.

With such a variety of mechanical, electrical, hydraulic and pneumatic equipment and systems fitted in the ship, there is never a dull moment.



A 'birds eye view' of an engineer's problem



Supply and Secretariat Department

The Supply Officer and his team provides the 'hotel', administrative and stores services to the ship. The Department is divided into six sub-departments each headed by a senior rating.

The Stores section is headed by a Chief Petty Officer Stores Accountant who maintains some 25,000 items valued at well over £4 million. They range from spare parts for multi million pound weapon systems to detergents and light bulbs.

The Catering Section is responsible for ensuring that the ship is fully stored with food. All sailors have a healthy regard for their appetites and thus the caterers work closely with the cooks and stewards to prepare the daily menu.

HMS SHEFFIELD's Cooks have to produce nearly 800 meals per day. The main galley is the size of three household kitchens and is well equipped with ovens, ranges and steamers as well as a large pressure cooker and an ice cream machine.

The Wardroom has a much smaller separate galley to serve the Captain and the Officers, as well as a large number of visitors and special functions in addition to the usual meals.

The remaining "Naval" branch of the department work in the Ship's Office. Here the Captain's Secretary,

the Petty Officer Writer and 2 Writers deal with the Ship's correspondence, personnel reports and records, internal administration, pay and cash.

The "non uniformed" personnel within the department are the NAAFI Manager and his Assistant who are both civilians. The NAAFI canteen provides for the daily needs of the modern sailor, ranging from soap and shoe polish, nutty and beer to watches and cameras.

The Supply department also meets a whole ship requirement fulfilling a variety of other tasks onboard in both peace and war-time roles. These include Flight Deck Officers, Fire and Repair Party Section Officers, Education and Resettlement and Public Relations.



Naval stores



H.M.S. Sheffield
THE SHIP'S COMPANY



THE SHIP'S COMPANY



5(5) T C Carter
 5(5) S P Radford
 5(5) S A J Harrop
 5(5) G A Fenwick

Operations (Electronic Warfare)

PO(EW) K Fear
 LS(EW) J A Hogan
 LS(EW) P D Baker
 AB(EW) K M Buckley
 AB(EW) P A Kavanagh
 AB(EW) P J Whitworth
 S(EW) J F Moore

Operations (Seaman)

CPO(SEA) B C Savage
 LS(SEA) K W Drake

Operations (Communications)

CCCT G W J Champion
 CPOCT S H Bunting
 CPOCT C A Ling
 CY M Jordan
 RS C Sage
 LRO(T) B J Skelley
 LRO(G) J A Davies
 LRO(G) T Spence
 LRO(G) J V Steer
 R01(T) P E Daniel
 R01(T) R D Lawson
 R01(T) K M Mitchell
 ROM T J Lett
 RO(T) J A Cooke
 R01(G) S J Dodds
 R01(G) J N Graham
 R01(G) M Holden
 R01(G) A J Delaney
 R01(G) G W Blake
 R01(G) C M Adamberry
 RO(G) S P James
 RO(G) D A Seaton
 RO(G) T Jones
 RO(G) D A Rouse

Officers

CAPTAIN	A Morton DSC RN	IN COMMAND
CDR	T C Emms RN	MEO
CDR	M J Duffy RN	WEO
LT, CDR	R F Evans RN	FIRST LT
LT. CDR	R Ibbotson RN	OPS OFFICER
LT	C Haley RN	PWO(A)
LT	P R Cook RN	NAVO
LT	P A Cook RN	SCO
LT	S R Gosden RN	DMEO
LT	R H Paget RN	DWEO
LT	N S Hawkins RN	SO
LT	J P Lavery RN	CAPTS SEC
LT	M J C Magan RN	WEGO
S,LT	S P Price RN	CBO
S,LT	N J Davies RN	(00W3)
S,LT	P Myres RN	(00W4)
MID	W P Austin	OUT
MID	J A Herriman	OUT
MID	P J Shepperd	OUT

LS(M)	A Reid
AB(M)	S P Milstone
AB(M)	G H Berkeley
AB(M)	D K Ingham
AB(M)	P S Egan
5(M)	A G Duncan
S(M)	N Stanley
S(M)	J L Jordon
S(M)	P C Mason
S(M)	S R Guest

Operations (Sonar)

CPO(OPS)(S)	R J Drew
PO(S)	P Stankevitch
LS(S)	N S Purgavie
LS(S)	P Plumb
LS(S)	G R Dorr
AB(S)	D T P Pawley
A B(S)	M Webster
AB(S)	M P Gibson
AB(S)	G P Garford
AB(S)	J F Inglis
AB(S)	I A Henrys
S(S)	A C Hansford



Executive and PT

MAA	M S Gray
LREG	S Guerin
LPT	J A Murray

Operations (Radar)

CPO(OPS)(R)	R S Simmons
PO(R)	G S Williams
PO(R)	B J Parkinson (HO)
LS(R)	D J Marsden
LS(R)	B F Phelan
LS(R)	J D Mortimer
LS(R)	P K James
AB(R)	S D Smith
AB(R)	R J Buckley
AB(R)	5 A Armitage
A B(R)	D A Palmer

AB(R)	G Thorp
AB(R)	G Sage
AB(R)	S W Reid
AB(R)	M J R Smith
S(R)	G Holmstrom
5(R)	Guyan
S(R)	D Harrison
S(R)	L Thompson
S(R)	M Kerlin
S(R)	M Winter

Operations (Missile)

CPO(OPS)(M)	T R Turnell
PO(M)	G Wilkinson
LS(M)	D J Jones
LS(M)	C J Clarkson
LS(M)	F P Baker

Marine Engineering,

CCMEA(ML) D S Simpson	LMEM(L)	J Wilson
CCMEA(EL) P Cheel	LMEM(L)	S Dornan
CMEM(M) M D Langley	LMEA	C L Dumbleton
CPOMEA(ML) J Lawtey	LMEA	S M Southern
CPOMEA(ML) M A Brain	MEM(M)	M J Rowlinson
CPOMEA(ML) J Wood	MEM(M)	A K Smith
CPOMEA(ML) D E Mudge	MEM(M)	F Tomey
CPOMEA(ML) I Dennison	MEM(M)	B T Conran
CPOMEA(ML) S Yale	MEM(M)	I R Price
CPOMEA(EL) K Brain	MEM(M)	M A Reed
POMEA(ML) A White	MEM(M)	A D Hill
POMEA(ML) J W Barker Hahlo	MEM(M)	I D Thomas
POMEA(ML) P J Higgins	MEM(M)	N A Riley
POMEA(ML) S Bowling	MEM(M)	R O Hurst
POMEA(EL) A Cragg	MEM(M)	P Elmy
POMEM(M) C G Patterson	MEM(M)	J F Taylor
POMEM(M) M Dunn	MEM(M)	W R Conway
POMEM(L) D J Box	MEM(L)	M J Shields
POMEM(L) S J Paterson	MEM(L)	M R Brown
POMEA G A Rawlings	MEM(L)	G S Clayton
POMEA M Ollis	MEM(L)	D S Tunnicliffe
POMEA R G Howe	MEM(L)	J D Scott
LMEM(M) J S Minter	MEM(L)	F S C Hutton
LMEM(M) A J Nevin	MEM(L)	P J Wookey
LMEM(M) R E Hopwood	MEM(M)	P A Pooley
LMEM(M) P R Ranscombe	MEM(M)	D W J Chandler
LMEM(M) A J Taylor	MEM(M)	A P Benson
LMEM(M) A C Readman	MEM(M)	A J Keeler
		J C Forsyth

Weapon Engineering

WOWEA(ADC) D J Jones
CCWEA(WDO) G Dalby
CWEM(O) C J Fortune
CWEM(R) K Blackhurst
CPOWEA(AD) A M Ramsdale
CPOWEA(WD) N C Snook
CPOWEA(AD) J L Blake
CPOWEA(CEW) D Hylton
POWEM(O) M Donaghue
POWEM(O) S G Sexton
POWEA(AD) P T Johnson
POWEA(CEW) S P McClure
POWEA(WD) D T Dowdall

POWEA(WD) G Brickley
POWEA(AD) J D Evans
POWEA R J C White
POWEA P R Gillham
LWEM(R) S R Chapman
LWEM(R) P A Gani
LWEM(R) A Quick
LWEM(R) A W Whittington
LWEM(R) I W R Gulliford
LWEM(R) M D Curtis
LWEM(O) P N Wroot
LWEM(O) R A Walker
LWEM(O) S R Ollis
LWEA D M Perry

WEM(R) P L Mendham
WEM(R) R Brain
WEM(R) S McDonald
WEM(R) D Williams
WEM(R) W Walker
WEM(O) J Howarth
WEM(O) S M Avery
WEM(O) J R De'Rome
WEM(O) R J Parker
WEM(O) J D Bailey
WEM(O) N J Undy
WEM(O) W I Farish
WEM(O) R T B Hernon
WEAAPP D G Summers
WEAAPP G N Sawford
WEAAPP S J Arthur

Supply and Secretariat

CPOSA S P Green
CPOMA R H Lockhart
POWTR J D Edge
POCA M Melville-Brown
POCK M S Willis
POCK M D Bailey
POSTD B E Paynter
LWTR D Kennedy
LCK(CA) G I Dunkley



LCK(C)	M Ross
LCK(C)	D W Jones
LSTD	W G Yule
LSTD	M J Moore
LSTD	G T Ingram
LSA	C B Thomas
LSA	5 A Young
WTR	G A Davies
WTR	G Brown
SA	M A Baskerville
SA	G Bass
SA	M Alexander
SA	S T Vickers
CK(CA)	S J Mee
CK(C)	R C Triffitt
CK(C)	K Springett
CK(O)	A Stennings
CK(C)	K N Stephenson
CK(C)	R S Tansley
CK(C)	K J Hillier
STD	F A Guiver
STD	R J Hawkins
STD	G J Morgan
Canteen Staff	
MR	D Lee
MR	R Davies
Laundry	
MR	Julius Lee





Seawolf British Aerospace

British Aerospace manufactures the extremely successful Seawolf missile used in conjunction with the GWS 25 MOD 3 point defence missile system fitted in HMS SHEFFIELD.

Seawolf is a rapid response missile that is launched and guided to the target entirely automatically unless prevented by manual intervention. It consists of a solid fuel rocket motor which accelerates the missile to supersonic speed beyond Mach 2. After burn out the missile then coasts to the target.

Two Royal Navy Type 22 Frigates armed with Seawolf served in the Falklands campaign

— HMS BROADSWORD and HMS BRILLIANT, and were credited with destroying five hostile aircraft. In one engagement two aircraft in an attacking formation of four were shot down by Seawolf missiles, the third crashed into the sea while taking evasive action and the fourth escaped as the sole survivor.

No opportunity occurred during the Falklands campaign for Seawolf to engage anti-ship missiles.

However in a representative operational trial conducted later by the Royal Navy a Seawolf missile successfully intercepted and destroyed an Exocet sea-skimming anti-ship missile.

Seawolf missiles are a key element in the Royal Navy's modern armoury as to date the GWS 25 Seawolf system is fitted in nine Type 22 Frigates and five Leander Frigates. New variants of the missile are now being developed which will see the Royal Navy well into the next century.





GWS 25 MOD 3 Marconi Radar Systems

In 1938 HMS SHEFFIELD was the first British Cruiser to be fitted with a sea-going prototype radar, the Type 79Y, to give long range warning of aircraft.

Although the Marconi Company was previously engaged in radio communications, the expertise available was quickly adapted to the rapid development required for naval radars at the start of World War II. As a result the Marconi Type 281 radar was fitted into HMS SHEFFIELD in 1942, and at that time, recorded as the most powerful aircraft warning radar to go into naval service.

From that early start, the Marconi Company has been closely involved in the development and manufacture of naval radar and weapon systems. These included the Seadart fire

control radar Type 909 fitted in the second HMS SHEFFIELD.

Today, the very latest Marconi radar equipment is being fitted into the latest HMS SHEFFIELD. This provides surveillance and tracking facilities, as well as Seawolf missile guidance, for the GWS 25 MOD 3 point defence system which comprises

Type 967M Surveillance Radar.

This is capable of detecting targets as small as a 4.5" shell, almost as soon as it leaves the gun barrel, and allocating it as a target to one or both tracking radars.

Two Type 911(1) Tracking/Guidance Radar. This can rapidly acquire "967M allocated targets" and those designated from other sources. It then provides for continuous target tracking and simultaneous missile guidance for up to two Seawolf missiles.

Two six barrel Vickers launchers.



911 (Marconi 805SW) Seawolf director



Propulsion Rolls Royce

The propulsion machinery supplied by Rolls Royce for installation in the new HMS SHEFFIELD, is exactly the same as her predecessor which was tragically lost during the Falklands conflict. She is fitted with two Marine Tyne engines for cruising and two Marine Olympus as boost engines for high speed manoeuvres.

Installed in a COGOG (Combined Gas Turbine or Gas Turbine) arrangement, each of the two shafts can be driven by either a Tyne or Olympus Engine. SHEFFIELD can cruise on one or both Tyne engines, but when a higher speed is required one Olympus can be run instead of the Tynes and when full

speed is needed both Olympus units can be utilised.

Development of the marine Olympus began in 1963 and continuous development lead to the TM3B unit of 28,000 hp now installed in HMS SHEFFIELD. The marine Olympus is one of the most experienced propulsion units in the world, with half a million operating hours to its credit.

The smaller marine Tyne engine at 5,340 hp (4 MW) was developed exclusively as a high efficiency naval cruise power unit and first entered service in 1968 in an evaluation hydrofoil for the US navy and it entered service in the Royal Navy in 1974.



The Rolls Royce Olympus gas generator

FERRANTI
INTERNATIONAL

Command System *Ferranti Computer Systems*

CACS (Computer Assisted Command System) is a family of highly automated Naval Command and Control Systems developed by Ferranti. It is the latest generation designed for the Royal Navy to meet the heavily increasing demands placed on computer systems at sea by modern data links, sensors such as radar and sonar, and weapons. CACS provides the total management and information processing capability required to make a warship the most efficient fighting unit possible.

CACS 1 is at sea in HMS BOXER, BEAVER, BRAVE, and LONDON the Type 22 Batch 2 frigates and both HMS COVENTRY and SHEFFIELD will both operate with a CACS 1 system. CACS 4 and 5 have been developed for the new Type 23 Duke class frigate and the Batch 3 Type 22s.

CACS optimises a ship's fighting capability by integrating the three elements of the combat system — the sensors, weapons and command facilities so it can carry out all the key operational functions. These include Surveillance, Tactical Evaluation and Resource Management (TERM), Weapon Direction, Data Link, Sonar, Aircraft Control, Alert Systems, Electronic Warfare and On-board training.

Within the systems are one or more computing nodes to provide the main processing capability. Each node has two close coupled FM1600E computers, with a further FM1600E loosely coupled to the other nodes to form the Ancillary Processing Unit. This configuration combines processor redundancy with shared access memory and backing store so that failure or damage will not be disruptive.

The new lightweight Seawolf missile system onboard uses Ferranti developed fire control software and employs Ferranti FM1600E and B computers in both its tracking and surveillance sub-systems.

DOWTY

Towed Array Sonar *Dowty Marine Systems Ltd.*



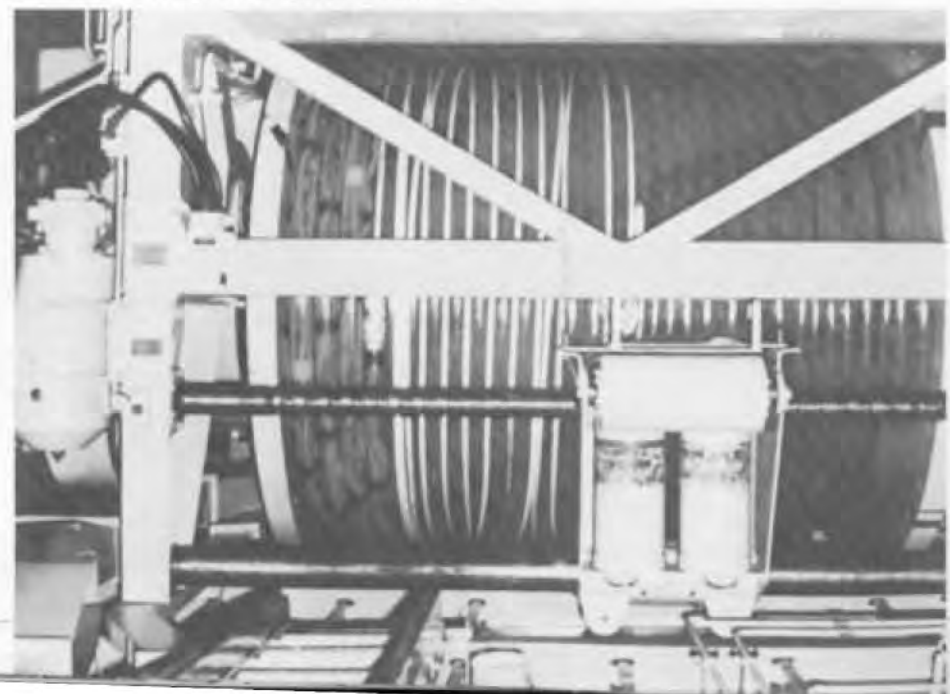
The Waverley Division of Dowty Maritime Systems Limited is a main contractor to the Ministry of Defence for the development, manufacture, installation, trials and in service support of towed array sonar systems. In the case of HMS SHEFFIELD this means the world beating 2031Z Towed Array Sonar.

All ships and submarines emit 'noise' from their machinery into the water and towed array sonars are the only shipborne sensors capable of detecting and classifying submarine threats by their 'noise signature' before they can close to attack range. Because the sonar is

passive (listening only, not 'pinging') the towing vessel has the great advantage of not having to disclose its own position while searching for other vessels.

The 2031Z towed array sonar consists of acoustic modules contained in a soft plastic hose filled with fluid which is towed behind the ship by an armoured tow cable that also transmits data from the array to the ship's electronic system. The array and cable is stored on a large winch sited on the quarterdeck from which it is streamed when required.

Sonar 2031Z winch with towed array reeled in



CACS consoles in the Ops Room

We are most grateful to the following organisations for their generous help in the production of this book:—

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Dowty Maritime Systems Ltd —
manufacturers of 2031Z towed array sonar

Ferranti — *Command & Control, all weapon systems are controlled by Ferranti Computers*

Hawker Siddeley Dynamics —
manufacturers of equipment for the Ship's Control Centre

MRS� — *the GWS 25 MOD 3 Surveillance and Tracking Radars are made by MRS�*

Paxman Diesels — *manufacturers of the Ship's four diesel generator drive units.*

Rolls Royce — *both the Tyne and Olympus gas turbine propulsion units are produced by Rolls Royce*

Sheffield Chamber of Commerce

Sheffield City Council —
SHEFFIELD's affiliated city

Sheffield Junior Chamber of Commerce

Sheffield Star Newspaper

Swan Hunter Shipbuilders Ltd —
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Yorkshire Television



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