



WARPAINT Series No. 65

WESTLAND WESSEX

By Charles STAFRACE

Two Westland Wessex HC.2s of No.28 Squadron when based at Sek Kong in the New Territories on patrol over Hong Kong harbour. (Adrian Balch)



Westland Wessex Colour Schemes by Richard J. Caruana

Westland Wessex HAS.1,
XM832/506, No. 700H NAS,
1961. RAF Blue-Grey
(BS.381C/633) overall; all
lettering in white



Westland Wessex HAS.1,
XM844/302, No. 815 NAS,
September 1961. RAF Blue-
Grey (BS.381C/633) overall
with Golden Yellow
(BS381C/356) fuselage top;
lettering in white. Unit badge
in gold on black on fuselage
sides

Westland Wessex HAS.1,
XP104/A-B, No. 845 NAS,
1962. Light Stone
(BS381C/361) overall with all
lettering in black, with code
'B' repeated on nose; unit
crest on engine cowling



Westland Wessex HAS.1,
XP117/273/V, No. 814 NAS,
HMS Victorious. RAF Blue-
Grey overall with Golden
Yellow upper decking. All
lettering is white; unit badge on
engine cowling

Westland Wessex HAS.1,
XS869/H-266, HMS Hermes
SAR, 1970. RAF Blue-Grey
overall with Dayglo Orange
nose and rear fuselage sec-
tions; lettering in white, thinly
outlined in black on orange
sections. '66' repeated on top
of nose, 'HERMES' in white
on lower nose; HMS Hermes
crest on a white background
on engine cowling



Westland Wessex HAS.1,
XS877/E-265, HMS Eagle
SAR, 1971. RAF Blue-Grey
overall with Dayglo Orange
nose and rear fuselage sec-
tions; lettering in white, that
on orange sections being
thinly outlined in black. '65'
repeated in white on nose;
HMS Eagle's badge in white
on engine cowling



WESTLAND WESSEX

By Charles Stafrace

With the end of the Second World War and the bitter experience of the success of German submarines against Allied shipping, the United States Navy began serious evaluation of the use of helicopters for anti-submarine warfare. This came about when it was discovered that a sonar transducer lowered from a helicopter and dipped into the sea could detect the presence of a nearby submarine. By the time of the Korean War helicopters had joined the US fleet in limited anti-submarine warfare, rescue work, plane guard, medical evacuation and other utility tasks. By 1955 HSS-1 helicopters of the US Navy, better known as the Sikorsky S-58 operating from aircraft carriers and other warships, were carrying dipping sonar, homing torpedoes and a four-man crew for submarine hunting operations. Similar interest was being shown by the British Royal Navy, which was experimenting with indigenous types.

Almost in parallel, the United States Marine Corps were using the Sikorsky S-58 to further evolve the tactics and doctrine of vertical assault using the helicopter. But

the S-58 was more than that. Used for a variety of other roles also by the US Army and US Coast Guard, and eventually in a much modified character by the British Royal Navy and the Royal Air Force, as well by several other air arms and civil operators around the world, the S-58 and its British development known as the Wessex was undoubtedly one of the most versatile and successful medium-size helicopters ever produced.

Developed from a Sikorsky type as were indeed its predecessors and immedi-

ate successor, the British Wessex version as developed by Westland was the world's first frontline helicopter powered by a free power gas turbine as well as becoming the world's first anti-submarine helicopter capable of all weather dipping sonar operations.

When the Wessex first entered service with the Royal Navy in 1963 the Sikorsky S-58 had already been in US service for

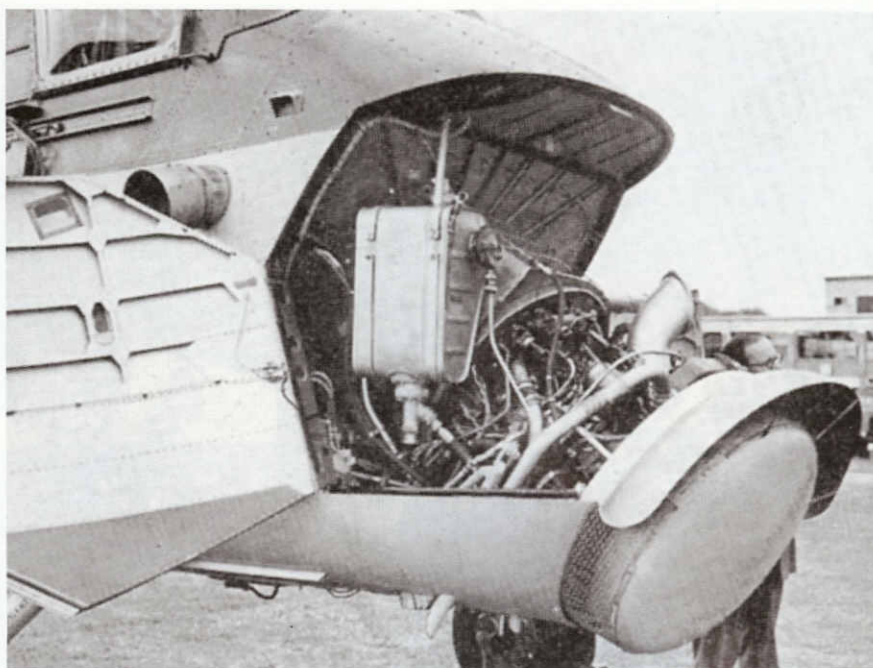


Sikorsky HSS-1N XL722, Bu. No. 141602 which served as a pattern aircraft

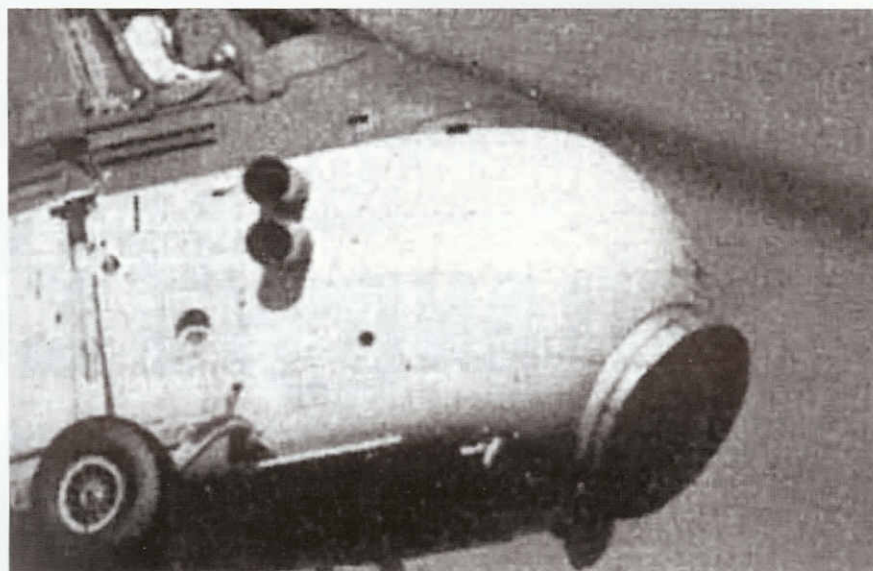
eight years. However, it was the British version as developed by the enterprising Yeovil company that exploited to the maximum the airframe's sturdy build, adapting it for a variety of roles as versatile as air-sea rescue, ASW, ground support, assault, troop transport, casevac and general purpose, tasks in which the Wessex carried out with style for no less than 40 years.

Some claim that Britain had never really established a strong indigenous rotorcraft industry because Westland relied too much on adapting Sikorsky types. It is a fact that Britain somewhat abandoned this field of aviation industry in favour of other areas. Britain certainly developed some types worthy of note but which never reached the world stage, such as the Bristol Sycamore and Bristol 192/Westland Belvedere, the Fairey/Westland Rotodyne, the Cierva/Saunders-Roe Skeeter. Westland's own most successful models produced during the Sikorsky period were the Wasp and Scout, but again these did not make an impact on the export market. Moreover, the failure of British indigenous designs to reach RAF and RN expectations resulted in Britain relying on Westland to adapt proven Sikorsky models which the British company developed with flair and which achieved what their original designers would have hardly contemplated. Such was the story of the Wessex which the Yeovil manufacturer converted from a piston engined helicopter and used turbine technology to give the British machine a significant performance advantage over its original American version.

The Wessex followed the Sikorsky S-51 Dragonfly and Sikorsky/Westland S-55 Whirlwind into British service and delivered what these predecessors had initiated in terms of helicopter involvement as a war machine. It saw action in various theatres of war, notably in Borneo and the Falklands. Indeed it laid the strong foundations on which helicopter operations and tactics by both Royal Navy and Royal Air Force are now based. Until the arrival of the Sea King, the Wessex soldiered on faithfully in the British services decades after the original S-58 models had disappeared from US military service. Its construction by Westland also enabled the British company to acquire the necessary expertise to develop its own designs which



Above: HSS-1N XL722 with original S-58 clamshell nose doors. Below: HSS-1N XL722 with original circular intake.



culminated in the Merlin for both RAF and RN.

Apart from the rare occurrence of ground resonance which then resulted in a crash-landing during hover, the Wessex did not suffer from any particularly seri-

ous vice, and was a pilot's machine. Its reliability increased considerably in the twin-Gnome models which gave the pilot enough reserve power to perform difficult manoeuvres, such a landing in jungle clearings deep among high trees or hovering for a rescue operation in bad weather. For the loyalty and longevity of its service with both RAF and RN and with the other foreign air forces, and the valid contribution it gave to the development of rotary-wing operations and tactics, the Wessex deserves a place in the annals of British aviation history.

SIKORSKY AND THE EARLY HELICOPTERS

The Wessex was the third member in a Sikorsky family line of helicopters anglicised by Westland to equip Britain's air arms. It came in time to fill an important gap in the British services when helicopter operations as we know them today had

HSS-1N XL722, with an almost definitive nose and Gazelle engine



Westland Wessex HAS.1,
XS877/PO/516, No. 772
NAS, 1975. RAF Blue-Grey
overall with Dayglo Orange
nose and rear fuselage sec-
tion; lettering in white, thinly
outlined in black on orange
areas. Unit badge on engine
cowling



Westland Wessex HAS.1,
XS863, Aircraft & Armament
Experimental Establishment,
summer 1976. Signal
Red/white finish with serial in
white

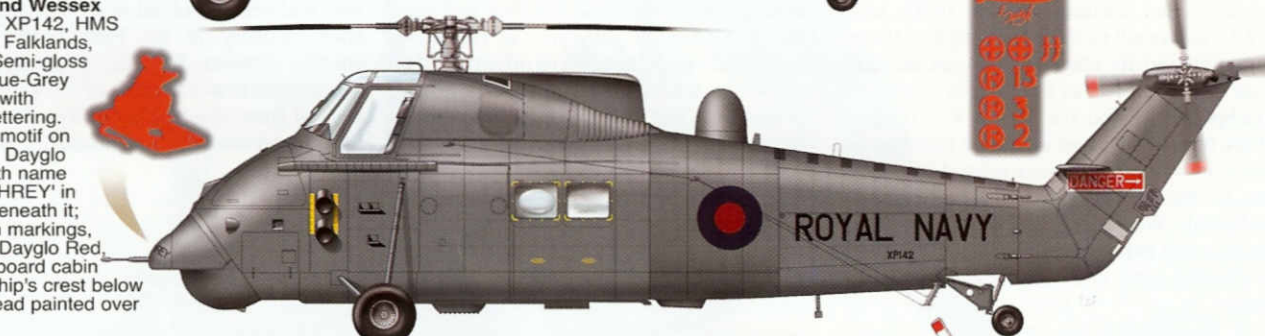
Westland Wessex HAS.3,
XP110/568, No. 706 NAS,
1967. RAF Blue-Grey overall
with Golden Yellow upper
fuselage; all lettering in
white, with '68' repeated on
nose. Unit crest on engine
cowling; blue/white markings
on wheel covers



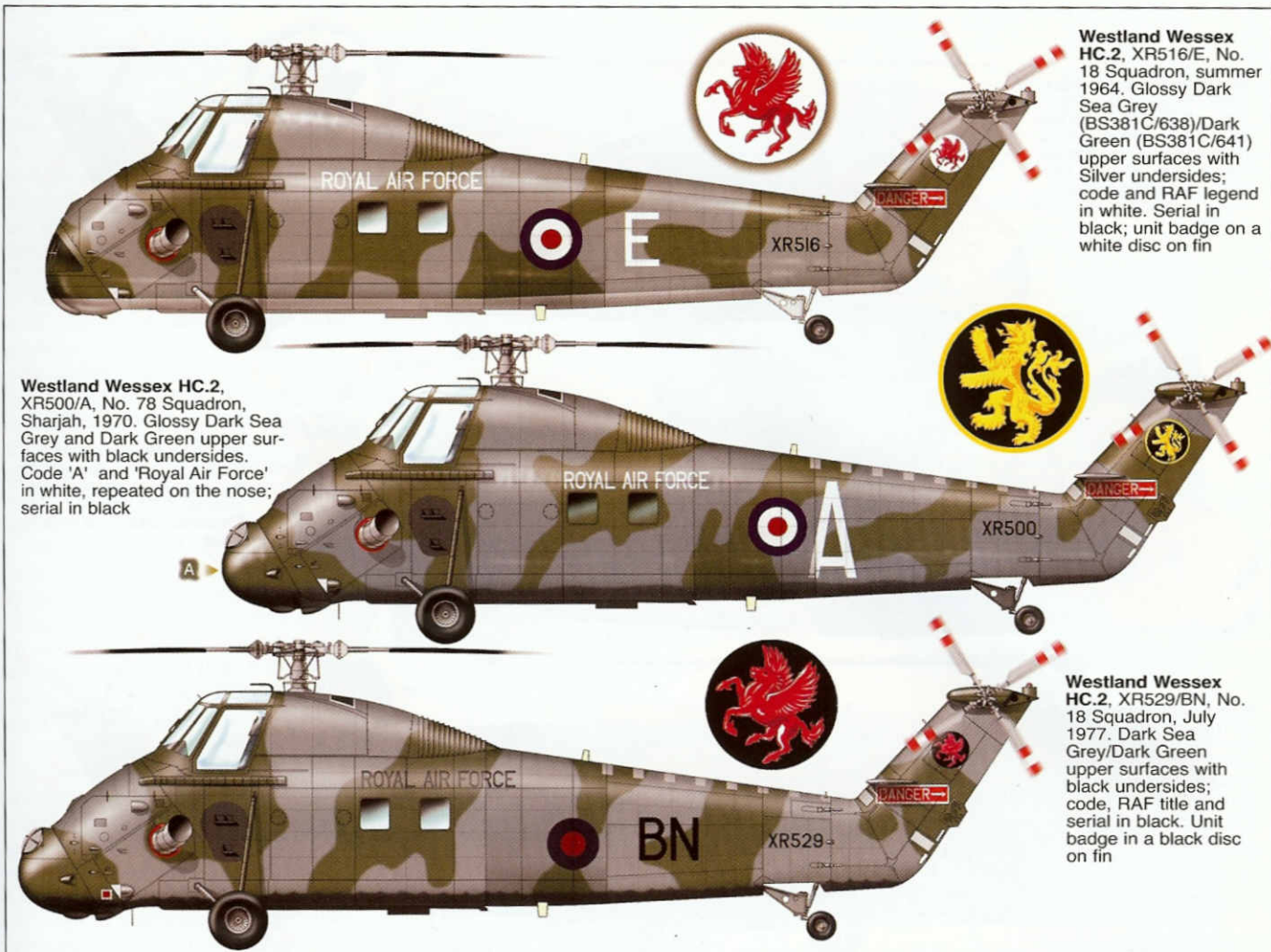
Westland Wessex HAS.3,
XM870/PO-652, No. 737 NAS, 1982.
RAF Blue-Grey overall with Golden
Yellow upper fuselage; all lettering in
white, '52' repeated on nose. Unit
crest on engine cowling



Westland Wessex
HAS.3, XP142, HMS
Antrim, Falklands,
1982. Semi-gloss
RAF Blue-Grey
overall with
black lettering.
Mouse motif on
nose in Dayglo
Red with name
'HUMPHREY' in
black beneath it;
mission markings,
also in Dayglo Red,
on starboard cabin
door. Ship's crest below
rotor head painted over



Westland Wessex HAR.2,
XV724, No. 22 Squadron RAF,
St Mawgan, 1978. Gloss Golden
Yellow (BS-356) overall; all letter-
ing is black. Note 'RAF Rescue'
repeated on nose



Westland Wessex HC.2, XR516/E, No. 18 Squadron, summer 1964. Glossy Dark Sea Grey (BS381C/638)/Dark Green (BS381C/641) upper surfaces with Silver undersides; code and RAF legend in white. Serial in black; unit badge on a white disc on fin

Westland Wessex HC.2, XR500/A, No. 78 Squadron, Sharjah, 1970. Glossy Dark Sea Grey and Dark Green upper surfaces with black undersides. Code 'A' and 'Royal Air Force' in white, repeated on the nose; serial in black

Westland Wessex HC.2, XR529/BN, No. 18 Squadron, July 1977. Dark Sea Grey/Dark Green upper surfaces with black undersides; code, RAF title and serial in black. Unit badge in a black disc on fin

come of age but which available models and systems were not yet able to implement. The Wessex as used by the Royal Navy, Royal Air Force and a number of other air forces was introduced to fulfil three main roles – rescue, anti-submarine and ground support. The Wessex can be said to have bridged the old concept helicopter, as envisaged in the 1940s, with the new technologies that became available later. It also arrived on the scene to face the realities that surfaced in the 1960s and 1970s as a result of the worsening Cold War situation and its associated Soviet submarine threat, as well as the various wars and flashpoints around the world. For Britain these particularly concerned the Indonesian crisis in which the Wessex proved its validity in the ground support role, and the Falklands War where the type's anti-submarine and troop transport capability were confirmed even in the twilight of its naval career.

The Wessex was in effect a turbine-powered direct development of the Sikorsky S-58 developed in Britain to its maximum potential. The Sikorsky firm in the USA had established itself as the world's leading rotorcraft manufacturer, with the Soviet Mil perhaps competing, not for markets (since both USA and USSR had their respective spheres of political influence) but for technological innovation.

Wessex HAS.1 XM837 at Farnborough, September 1962. The Royal Aircraft Establishment used a variety of Wessex helicopters during this period for experimental purposes.

Sikorsky, the man, was himself a Russian who had produced fixed wing types earlier in the 20th century but had elected to emigrate to the USA.

Experiments with vertically-lifting rotorcraft go far back to the 15th century when Leonardo da Vinci came up with the idea that air can be forced downwards by a fast-turning screw-type device. Obviously, Da Vinci did not have the powerplant to put his paper ideas into practical use. Five centuries on this became possible and during the 1930s the autogyro, as flown by Cierva and others, seemed to offer the solution. It was the Germans, however, who led the world in that period, thanks mainly to Focke-Achgelis and Flettner, with the for-

mer building the first practical helicopter in 1939. Whilst the Germans were pioneers in helicopter development and operations, their defeat in the Second World War meant that postwar development in the field of rotorcraft would pass to other countries, mainly to the USA and USSR.

Fortunately for the US industry, much before the demise of the Nazi regime, Igor Sikorsky had come on the scene. Sikorsky was a Russian, more precisely a Ukrainian, who had been involved in the Russian aviation industry in the First World War, chiefly famous for the Sikorsky Ilya Mourometz heavy bomber of 1914. In 1917 he fled from the Bolshevik Revolution to France and after years of producing private





Wessex HAS.1 XL729, the third pre-production example built, fully retracted for easier stowage on ships. XL729's first assignment was with the A&AEE for handling trials in June 1959.

the British Royal Air Force (used by No. 539 Squadron) and Fleet Air Arm (used by No. 705 and 771 NAS) as the Sikorsky Hoverfly HR.1 under wartime Lend/Lease arrangements, becoming the first rotary-winged aircraft to enter British service. In some contemporary publications one finds reference to these aircraft as 'Gadfly', but this name was soon dropped and the more appropriate appellation 'Hoverfly' fortunately stuck.

The Sikorsky R-4B may be considered as the first practical helicopter since it pioneered virtually every aspect of rotary-winged flying, paving the way for the effective use of helicopters and becoming the most important forerunner of all present rotary wing types now flying. The R-4B soon gained a reputation for itself by becoming the first helicopter to land aboard a ship, and the first helicopter to effect the first rescue. By the end of the War the helicopter as represented by the R-4B had promised to offer considerable development potential, while the autogiro had arrived at a dead end.

Elsewhere in the United States other companies were spurred to experiment with rotary-winged craft. Bell, already renowned for its P-39 Airacobra and other fixed-wing fighters, flew its small, two-seat, two-bladed Model 30 helicopter in 1943. This model rapidly evolved into the famous Bell 47 which first flew in 1945,

Culdrose-based Wessex HAS.1 XM842/CU-504 leaving the deck of a fleet auxiliary RFA Engadine in the English Channel. (A.W.Hall)

designs, in 1938 he succeeded to convince the United States Government to consent to allocate the significant sum of \$2 million for rotary-wing research. The following year he emigrated to the USA, where the government agreed to fund a joint Sikorsky/Vought proposal. A new division of United Aircraft, Vought-Sikorsky, was formed and while others experimented with autogyros, Igor's project evolved into the Vought-Sikorsky model VS-300 helicopter, which formed a most important link between the early design principles of rotary-wing machines and the practical aircraft that would be suitable to and capable of military operation. The VS-300 was a single-rotor helicopter and managed to remain in the air for 92 minutes, establishing a world record and proving the practicality of the design.

Publicly demonstrated in 1940, the VS-300 was gradually improved and was performing well enough by the spring of 1941 to result in a contract being awarded to Vought-Sikorsky for the development of a two-seat version, designated the XR-4 (XR for experimental rotorcraft), for the US Navy and US Coast Guard. Unlike the VS-300, the XR-4 had a covered fuselage, side-by-side seating and dual controls, the flying controls in particular setting the standard for all subsequent helicopters. After re-engining and further development, the three-bladed XR-4 resulted in the definitive production variant, the R-4B, of which 130 examples were ordered as HNS-1. Of these, 25 were received by the US Navy and US Coast Guard and saw combat-zone use with the former in the closing months of the war in the Pacific. Forty-five were supplied to





Fresh from the Yeovilton factory is this Wessex HAS.1 XM326 from the first pre-production batch.

was the first helicopter to receive civil registration in 1946 and went into widespread use world-wide as the H-13, Sioux and other designations and is indeed still in military and civilian service today. The Hiller company too had entered the helicopter field with its XH-44 twin-rotor machine, but its smaller helicopter, the Model 12 three-seater, achieved better results and evolved into the UH-12 which, like the Bell 47, was produced in large numbers for various air forces under different designations.

While parallel rotary-wing develop-

ment was taking place also behind the Iron Curtain, in postwar Western Europe things were also moving, albeit at a slower pace, particularly in France and Britain. In France, after the aviation industry had been taken over by the state before the Second World War, two companies, Sud-Est and Sud-Ouest, pursued various helicopter projects, but it was not before the 1950s that the former developed the Alouette series while the other produced the small Djinn for the French Army.

Pre-war Britain had been keeping pace

with aeronautical design, but rotary wing research moved at a slower pace. By 1940, owing to war constraints and priorities, and also due to the belief that the helicopter would be of limited military use in the on-going war, rotary-wing development was abandoned indefinitely, until 1944 when the Bristol Aeroplane Company established its Helicopter Division and in 1947 flew its first helicopter, the Type 171. This model entered service with the RAF as the Sycamore and in certain aspects was more advanced than the Sikorsky R-5 and R-6 which had followed the R-4 in the United States. However, development in the US continued to press forward. The British Government, endeavouring to close the technological gap that was widening between British and US helicopter technology, resorted to funding research and development. This effort, however, failed, not so much as by ill-managed funding as through lack of interest shown by the military and civilian services to adopt British designs. Yeovil-based Westland Aircraft Company adopted a different philosophy and secured success.

WESTLAND AND SIKORSKY

At an early stage Westland saw the potential in building American designs under licence and then anglicise them. This method, if less lucrative and certainly less prestigious than building own designs, enabled the company to steer off costly R&D, to meet precise service and civilian requirements on time, to meet agreed costs and, most importantly, to survive. Indeed, this new form of indigenous technology proved so successful that by 1960, following the British Government's amalgamation policy of industry across the country, Westland had succeeded in absorbing Fairey Aviation and Saunders-Roe Ltd and the rotary-craft interests of Bristol, thus emerging as Britain's only helicopter manufacturer. These three companies had all been going concerns and indeed in previous years they had succeeded in flying valid designs, such as the Bristol Sycamore and Belvedere, the Fairey Rotodyne and the Saunders-Roe Skeeter respectively. These designs, except for the Rotodyne, had developed into military operational types though none can be classed as a market winner, while from Saunders-Roe came also their P.531 which Westland later developed into the successful Wasp/Scout. On the other hand Westland's Sikorsky models proved more competitive as the market was too small for sustained viability of small companies or company subsidiaries with their high costs of short production runs and expensive research, so that the absorption into Westland of these all-British helicopter manufacturers made good rationale.

The long history of co-operation between Westland and Sikorsky had begun in January 1947 when the British company,



Typical view of a Wessex HAS.1 with code PO-421 belonging to No.771 NAS from Portland effecting an air-sea rescue during training in March 1972.

Westland Wessex production

HAS.1 (140)

XL727-XL729, XM299-XM301, XM326-XM331, XM832-XM845, XM868-XM876, XM915-XM931, XP103-XP118, XP137-XP160, XS115-XS128, XS149-XS154 and XS862-XS889

HC.2 (66)

XR497-XR511, XR515-XR529, XR588, XT601-XT607, XT667-XT681, XV719-XV731

HAR.2 (6)

XS674-XS679

HAS.3 (3)

Built as HAS.3: XT255-XT257

Converted from HAS.1: XM327, XM328, XM331, XM833, XM834, XM836-XM838, XM844, XM870-XM872, XM916, XM918-XM920, XM923, XM927, XP103-XP105, XP110, XP116, XP118, XP137-XP140, XP142, XP143, XP147, XP150, XP153, XP156, XS119, XS121, XS122, XS126, XS127, XS149, XS153, XS862

HCC.4 (2)

XV732-XV733

HU.5 (101)

XS241, XS479-XS500, XS506-XS523, XT448-XT487, XT755-XT774
(of which XS485, XS498, XS518, XT463, XT479 were converted to HU.5C for RAF)

HAS.31 (27 for RAN)

N7-200 to N7-226.
(of which all but N7-206, 207 and 225 which crashed before 1967, and 217 which remained HAS.31A, converted to HAS.31B)

Wessex Mk 52 (12 for Iraq)
588-599

Wessex Mk 53 (2 for Ghana)
G-630 and G-631

Wessex Mk 54 (2 for Brunei)
AMDB-101 and AMDB 106

Wessex Mk 60 Srs 1 (15 for Bristow)
G-ASWI, ATBY, ATBZ, ATCA, ATCB, ATSC, AVEW, AVNE, AWOX, AWXX, AXPJ, AYNC, AZBY, AZBZ and AZCA

foreseeing a future market for helicopters, negotiated a licence agreement with the US manufacturer with a view to build suitable Sikorsky designs in Britain. The Sikorsky S-51 commercial helicopter had first flown on 16 February 1946 as a direct development of the R-5 of 1943. Though having a later model number, the Sikorsky R-6 had entered service before the R-5 as the HOS-1 and formed the equipment of the US Navy's first helicopter squadron in July 1946. It employed the same rotor and transmission system of the R-4 but had a streamlined, metal-skinned fuselage and a one-piece moulded plexiglas cabin for a two-man crew. Thirty-six HOS-1 were delivered to the U.S. Navy, 193 to the USAAF as the R-6A while in 1946 40 were supplied to Britain under Lend-Lease terms as Hoverfly Mk II. The British Fleet Air Arm received 15 of them for communications and training in 1946 while others equipped the Airborne Forces Experimental Establishment and the Royal Air Force's No.657 Squadron, which became the Service's first AOP squadron to fly helicopters.

The R-5 was developed concurrently with the R-6, and it too had an all-metal fuselage and carried a crew of two, seated in tandem. It was developed in response to a USAAF specification for an observation helicopter with a greater useful load, longer range, better speed and higher service ceiling than the R-4. Sikorsky thus created the S-48, which carried USAAF and US Navy designations R-5A and HO2S-1 respectively. An improved model was the R-5F, designated HO3S-1 in the US Navy, and it was this version that developed into the Sikorsky S-51, otherwise known in Britain

as the Dragonfly. The designations S-48 and S-51 were the manufacturer's terms, and in USAF service the S-51 became the R-5F until June 1948, when "R" designations for 'rotorcraft' were re-categorised as "H" for 'helicopter', with the result that the commercial S-51 became the USAAF H-5F.

It is felt that importance should be given to this model since its licenced construction in Britain heralded the start of a decades-long partnership between US Sikorsky and the British Westland companies that conditioned British helicopter use, development and industry throughout the entire second half of the 20th century.

THE S-51 DRAGONFLY

Until the late 1940s catapult-launched floatplanes were still the only aircraft that could be carried on warships other than air-

craft carriers. In the US Navy the floatplane then in use was the Curtiss SC-1 Seahawk but by 1948, with the entry into US Navy service of the Sikorsky HO3S-1, the advantages of the vertical take-off and landing attributes of helicopters became so apparent that these started initially to supplement the Seahawk and eventually to replace it altogether. The HO3S-1 thus became the first Navy helicopter to replace fixed wing aircraft operating with the fleet.

The first commercial Sikorsky S-51 was developed in 1946 based on the R-5s, but in addition to the pilot it could carry three passengers on a bench seat situated behind the pilot's seat. The machine incorporated many improvements but the 450 hp (335.5 kW) Pratt & Whitney R-985 Wasp Junior power unit of the earlier version was retained, this turning a three-bladed rotor and torque compensating tail vertical rotor and giving it a top speed of 90 mph (144.8 km/h). Its maximum take-off weight was almost 5,000 lb (2,268 kg) and in addition it could be fitted with a rescue winch (known as hoist in the US) capable of lifting 375lb. (170 kg). Although the lack of suitable instrumentation limited it to clear weather flying, the HO3S-1 could be said to be the first helicopter that could fulfil fleet operations on a realistic level. By 1947 deliveries started to be made to US Navy squadrons, the USMC receiving their first examples the following year, while Navy shipboard operations were also started in 1948. As more type training followed, the HO3S-1's operations came to include plane guard tasks, personnel transfer and mail delivery. The type also introduced into the US Navy the concept of a first line squadron furnishing one or two-plane detachments to vessels. Although initially a utility role was earmarked for the aircraft in the USMC, the HO3S-1 introduced the Corps to the idea of the helicopter being utilised as an assault machine as part of an amphibious operation.

The outbreak of war in Korea in 1950 gave the HO3S-1 a new role as a combat rescue helicopter when the USMC fixed-wing observation squadron VMO-6 received four HO3S-1s and in July of that year sailed to Korea, where the type undertook the successful rescue of downed airmen as well as the evacuation of combat



Wessex HAS.1 XP140/KE-181 of HMS Kent Flight at RNAS Yeovilton



Wessex HAS.1 XS872/E-061, No.820 NAS based on HMS Eagle in June 1970



Above: Wessex HAS.1 XS888/E-065 of No.820 NAS being recovered from the sea in December 1968. The Wessex was kept afloat thanks to its inflatable float packs fitted onto the wheel hubs. Below: Wessex HAS.1 XP110/PO-776 of No.737 NAS based at Portland armed with anti-submarine missiles.



casualties. By that time, however, the USAAF were already using better rotary types, and the HO3S-1's shortcomings in terms of speed, payload and instrumentation became very much evident.

In Britain, Westland acquired a licence to build the type as the WS-51 Dragonfly for the Royal Navy and Royal Air Force in 1947, the first example making its maiden flight in October 1948. This was Westland's first venture into helicopters and a total of 72 was built for both services up to 1953, Westland having re-engined them with a 550 hp (373 kW) Alvis Leonidas 521/1 engine. Dragonflies entered service with the RN's No 705 NAS at RNAS Gosport in 1950 and eventually served extensively both on board aircraft carriers and at shore stations on plane guard and SAR duties in HR.1 and HR.2 versions. However, it was US Navy machines that first saw war zone service with the Royal Navy when a small number of HO3S-1s was detached to British aircraft carriers off the west coast of Korea for SAR duties during the Korean War. In this role the type marked an improvement over the capabilities of the Walrus and Sea Otter amphibians still used for that purpose by the RN. The RAF received the Dragonfly HC.2 evacuation casualty version, the type being used extensively in its designated role during the Malayan Confrontation of the 1950s with No. 194 Squadron. It is to be noted for the record, however, that it was a British type which formed the equipment of the RAF's first helicopter squadron specifically assigned to SAR (or ASR – Air-Sea Rescue – the term used at the time) when No. 275 Squadron formed on Bristol Sycamore HR.13s in April 1953.

On the civilian scene the WS-51

Westland Wessex HC.2,
XV719/AA, No. 72 Squadron RAF,
Odiham, 1976. Dark Green and
Dark Sea Grey upper surfaces,
with the green painted over with
temporary white distemper for
winter operations; undersides
are black. 'B' style
roundels, black codes
and serial. Swallow in
marking faces forward
both sides



Westland Wessex HC.2, XS677/BY,
No. 240 Operational Conversion Unit,
1980. Dark Sea Grey/Dark Green
upper surfaces with black undersides;
black code, RAF title and serial



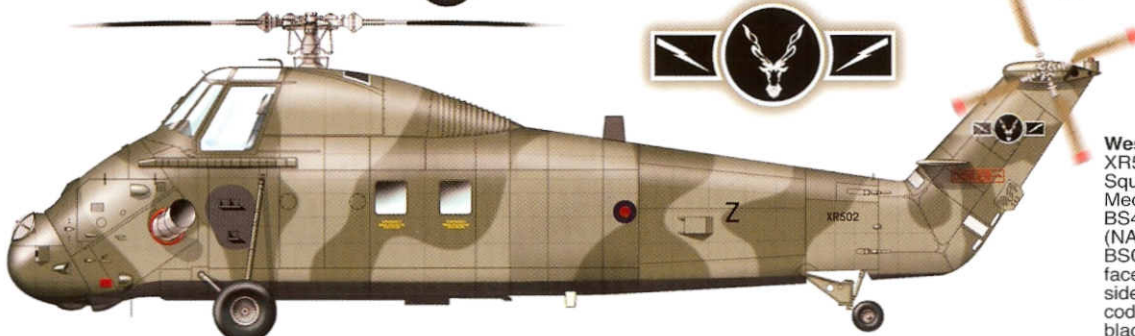
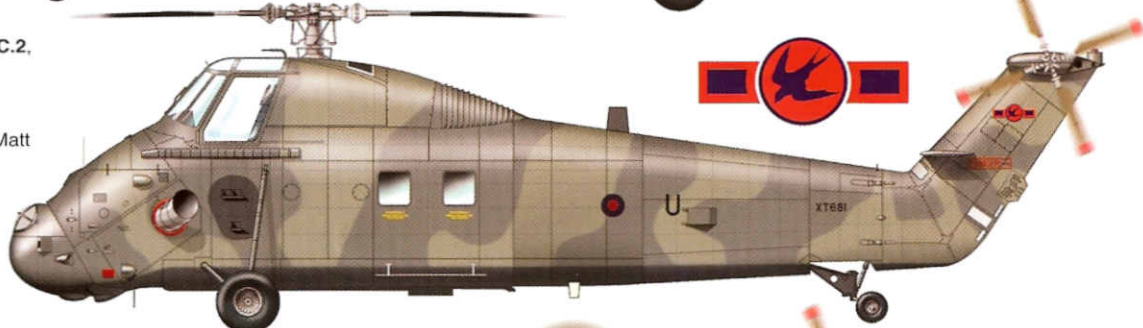
Westland Wessex HC.2,
XR526/A, No. 28 Squadron
RAF, Kai Tak (Hong Kong),
1981. Dark Sea Grey and Dark
Green upper surfaces; black
undersides. Large white bands
around fuselage and on front
of nose. Black code and
serial, with 'A' repeated
on white section of
nose



Westland Wessex HC.2, XR505/WA
'Aries', No. 2 Flying Training School,
summer 1995. Dark Sea Grey/Dark
Green 'wrap-round' camouflage with
Signal Red nose and rear fuselage
band; code and lettering in white,
with 'WA' repeated on nose.
Serial and RAF titles in black



Westland Wessex HC.2,
XT681/U, No. 72
Squadron, October
1994. Matt Medium
(Lichen) Green
BS4800.12B.25 and Matt
(NATO IRR) Dark
Green BSC241 on
upper surfaces with
black undersides;
serial and code in
black. Unit badge
on fin in red and
blue



Westland Wessex HC.2,
XR502/Z, No. 60
Squadron, 1995. Matt
Medium (Lichen) Green
BS4800.12B.25 and Matt
(NATO IRR) Dark Green
BSC241 on upper
surfaces with black
undersides; black
serial and
code. Unit badge
on fin in
black and white



Above: Wessex HAS.1 XP112/532, No.819 NAS, RNAS Ballykelly. In addition to the squadron badge it has the mailed fist of Northern Ireland on the tail.(MAP) Below: Wessex HAS.1 XS879/342 and XS878/H-341, belonging to HMS Hermes's 826 NAS in August 1966.



Dragonfly was the first British-built helicopter to gain a certificate of airworthiness. British European Airways used the Dragonfly for commercial operations, becoming the world's first operator of a helicopter-sustained, regular, scheduled service which it ran on the route Cardiff-Wrexham-Liverpool from 1 June 1950 to 31 March 1951.

THE S.55 WHIRLWIND

Without doubt the S-51 in both its HO3S and Dragonfly versions indicated the way to viable helicopter solutions in both the military and civilian fields. Still, in spite of the fact that it also opened up new horizons for the helicopter as an operational military machine rather than as an adjunct to the fleet or the army, and despite the fact that the type eventually remained in service until the late 1950s, the RN too identified inherent inadequacies in the Dragonfly and quickly realised that the next type to emerge from the Sikorsky stable, the S-55, was a quantum leap in terms of payload, range, size and performance in general, and that the new machine could implement tasks that until then could only be planned in theory with the smaller Dragonfly. The Sikorsky S-55 had already seen service in Korea by the US armed forces in 1951 and comparisons could be made and conclusions drawn. For example, the S-55 could carry 10 troops as a troop transport, or six

Wessex HAS.1 XS881/PO-515 of Portland-based No.771 NAS during a stretcher transfer with the Bembridge lifeboat in the Solent.





No. 18 Squadron was for many years based in Gutersloh, West Germany, supporting the British Army of the Rhine. Wessex HC.2 XV722-BH was one of the unit's aircraft.

litters and one attendant for medical evacuation.

When the S-55 first flew as the USAF's YH-19A on 10 November 1949 it had promised a radius of action of 210 miles (338 km) with a payload of over 5,000 lb (2270 kg). The US Air Force immediately ordered it as the H-19A with a 600 hp (447.4 kW) Pratt & Whitney R-1340-57 Wasp as the H-19B with a 700 hp (522 kW) Wright Cyclone R-1300-3 piston engine for transport service with MATS (Military Air Transport Service) and for rescue purposes, in which case it was designated HH-19B. The USMC purchased the type as the HRS-1 (equivalent to the H-19A) for artillery spotting, troop transport and casualty evacuation. In Korea on 13 September 1951 the Corps effected the first ever operational combat troop transport to an objective in a war zone when squadron HMS-161 carried US Marines to a hilltop being assaulted by Chinese troops. Eventually the USMC later added more HRS-2 and HRS-3 with Wright Cyclone R-1300-3 engines.

For similar roles the US Army placed orders for H-19C and D models, broadly identical to the USAF's A and B respectively. The Army too carried its H-19 to Korea where the helicopter proved its effectiveness in carrying out its tasks. The US Navy received its first S-55s as early as December 1950 as the HO4S-1, equivalent to the H-19A and in 1951 more of the Wright-powered HO4S-3, while the US Coast Guard ordered the similar HO4S-3G.

An early production Wessex HC.2 for the RAF. Note short exhaust pipes.

Of more relevance to this account is the interest shown by Westland of Great Britain in building the H-19 under licence for the British services and for foreign buyers as a follow on to the Dragonfly. The British services had already started receiving straight models of the Wright R-1300-powered Sikorsky S-55, designated Whirlwind HAR.21 rescue variant and HAS.22 ASW and communications variant, the latter equipped with dipping sonar equipment. Licence production by Westland, as the WS-55, commenced in November 1950 with the HAR.1 through to HAR.4, these flying in 1953 and having the Pratt & Whitney R-1340 engine, while the HAR.5, HAS.7 (a development of the HAS.22) and HCC.8 flew with the British

700 hp (522 kW) Alvis Leonidas Major piston engine. No. 845 NAS became the Royal Navy's very first ASW helicopter squadron on 15 March 1954 with eight Whirlwind HAS.22s fitted with Plessey Type 194 dipping sonar, initially sending detachments for trials on board HMS *Albion*, *Centaur* and *Triumph*.

The Whirlwind too had its share of active service in a combat zone. HAR.1s and HAS.22s of No. 848 NAS took part in the anti-terrorist war in Malaya in 1953. During the Suez Crisis of 1956 Whirlwind HAR.2s from the Joint Helicopter Unit were based on HMS *Ocean* for light transport and rescue duties, while HMS *Theseus* had on board Whirlwind HAS.22 of N^o 845 NAS stripped of their ASW equipment



FLEET AIR ARM NAVAL AIR SQUADRONS

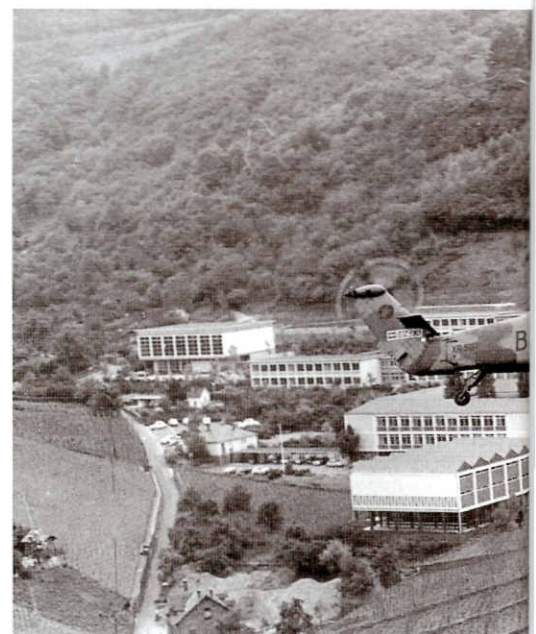
UNIT	BASE	WESSEX FROM-TO	VERSION	SERIALS
700H (IFTU)	Culdrose (Home base)	1 Apr 60 - 12 Jan 62	HAS.1	XM839/512
	Culdrose (Home base)	9 Jan 67 - 67	HAS.1	XP151
	Culdrose	9 Jan 67 - 15 Sept 67	HAS.3	XS121/CU-582
700V (IFTU)	Culdrose	5/12/63 - 7/5/64	HU.5	XS480/B
706 NAS (AFTS) (B Flt)	Culdrose (Home Base)	4 Jan 62 - Nov 70	HAS.1	XM838/CU-508
	HMS Bulwark	7 Jan 64 - late 64	HAS.1	
	Culdrose (Home base)	Jul 67 - Nov 70	HAS.3	XP110/CU-567
707 NAS (CAFTU) (Red Dragon Flt)	Culdrose (Home Base)	9/12/64 - May 72	HU.5	XS507/CU-W
	Yeovilton (Home Base)	May 72 - Apr 85	HU.5	XT486/VL-WW
	Yeovilton	29 /7/74 - 12/12/74	HU.5	
737 NAS	Portland (Home Base)	4/7/62 - May 78	HAS.1	XS119/PO-527
	Portland	Mar 67 - Dec 82	HAS.3	XP140/PO-654
	County-class destroyers	Jun 70 - Aug 82	HAS.3	XS862/AN-406
771 NAS	Portland (Home Base)	Dec 63 - Dec 63	HAS.1	XM837
	Portland	Nov 69 - Jul 74	HAS.1	XM774/PO-522
	Culdrose (Home Base)	Jul 74 - Jul 79	HAS.1	XS884/CU-522
	Culdrose	Mar 79 - Mar 88	HU.5	XT769/CU-823
772 NAS (FRU & SAR)	Portland (Home Base)	6/9/74 - Jul 76	HAS.1	XS877/PO-516
	Portland	Feb 76 - Mar 88	HU.5	XS492/PO-623
	(RFA vessels)	9/9/77 - Mar 88	HU.5	XS513/519
781 NAS	Lee-on-Solent (Home Base)	Jun 69 - 31/3/81	HU.5 (VIP) HU.5 (SAR)	XT772 XS523/LS-810
814 NAS	Culdrose (Home base)	28 Nov 61-14 Jul 70	HAS.1/3	
	HMS Hermes	26 May 62 - 20 Apr 63	HAS.1	
	HMAS Melbourne	20 Apr 63 - 8 May 63	HAS.1	
	HMS Hermes	8 May 63 - 26 Aug 63	HAS.1	
	HMS Victorious	26 Aug 63 - 9 Feb 64	HAS.1	XM926/V-276
	HMS Albion	9 Feb 64 - 22 Feb 64 Wessex Mk.1 (Commando)		
	HMS Victorious	22 Feb 64 - 6 May 67	HAS.1	XP117/V-273
	RFA ships (dets)	5 Sept 66 - 25 Aug 68	HAS.3	
	HMS Hermes	27 May 68 - 14 Jul 70	HAS.3	XM923/H-271
815 NAS	Culdrose (Home base)	4 Jul 61 - 7 Oct 66	HAS.1	
	HMS Ark Royal	13 Nov 61 - 10 Dec 61	HAS.1	XP104/R-053
	HMS Victorious	10 Dec 61 - 18 Dec 61	HAS.1	
	Lee-on-Solent	18 Dec 61 - 12 Jan 62	HAS.1	
	Culdrose	12 Jan 62 - 9 Mar 62	HAS.1	
	HMS Ark Royal	9 Mar 62 - 26 Aug 63	HAS.1	
	HMS Albion (det)	5 - 14 Aug 63	HAS.1	
	HMS Centaur	15 Jan 64 - 12 Mar 65	HAS.1	
	HMS Ark Royal	15 June 65 - 7 Oct 66	HAS.1	XM869/R-305
819 NAS (Wessex HQ Sqn)	Eglington (Home base)	5 Oct 61 - Feb 63	HAS.1	
	Ballykelly (Home base)	Feb 63 - 29 Jan 71	HAS.1 HAS.3	XP112/532 XP118/531
	HMS Centaur	4 Feb 63 - 29 Jul 63	HAS.1	
	HMS Victorious	29 Jul 63 - 5 Sept 63	HAS.1	
	HMS Hermes	5 Sept 63 - 14 Feb 64	HAS.1	
	HMS Lofoten	Oct/Nov 64	HAS.1	
	HMS Ark Royal	16 Jan 65 - 16 Mar 65	HAS.1	XM872/R-320
	Ballykelly	16 Mar 65 - Nov 65	HAS.1	XP113/531
	RFA ships	Nov 65 - Apr 68	HAS.1	XS149/530
	RFA ships	Apr 68 - 29 Jan 71	HAS.3	XP105/532
820 NAS	Culdrose (Home base)	Sept 64 - May 69	HAS.1	
	HMS Eagle	Dec 64 - Aug 66	HAS.1	
	RFA vessels	Aug 66 - Apr 67	HAS.1	XS122/E-290
	HMS Eagle	Apr 67 - Jun 68	HAS.1	XS888/E-065
	Culdrose	Jun 68 - May 69	HAS.1	
	Culdrose	May 69 - Jun 69	HAS.3	
	HMS Blake	Jun 69 - 26/10/70	HAS.3	XP104/BL-410
	RFA ships (dets)	May 70 - Jun 70	HAS.3	
	Culdrose	26/10/70 - Jul 71	HAS.3	
	RFA ships	Jan 71 - Mar 71	HAS.3	
826 NAS	HMS Blake	19/7/71 - Dec 72	HAS.3	XM833/BL-412
	Culdrose	27/1/72 - Dec 72	HAS.3	
826 NAS	Culdrose (Home base)	18/3/66 - 22/9/66	HAS.1	XS879/342
	HMS Hermes	22/9/66 - Feb 68	HAS.1	XS880/H-343



Wessex HC.2 XR516/BE of No. 18 Squadron chasing its reflection over the River Weser in West Germany

which were used in the first helicopter vertical assault by deploying more than 415 Royal Marines of No. 45 Commando from both carriers onto the Egyptian shore in record time.

The success of this new type of combined operations encouraged the UK to explore further the assault role of rotary craft and in January 1958 the world's first assault helicopter squadron, No. 728C NAS (Amphibious Warfare Trials Unit) of the Royal Navy was formed at Lee-on-Solent for the purpose of assessing and developing the technique of transporting Royal Marine Commandos from ship to shore in large scale invasion of beachheads. Equipped with four ex-ASW Whirlwind HAS.22s, the unit was ferried the following month to





Malta on HMS *Eagle* and *Ark Royal* and set up headquarters at RNAS Hal Far. Having their sonar gear removed and drawing on experience gained during the Suez Campaign, the Whirlwinds were re-rolled as assault craft and equipped with 2.75-inch rocket projectiles, fixed forward-firing guns and twin trainable machine guns in the main cabin, and carried out a number of exercises with the 3rd Commando Brigade of the Royal Marines ashore and aboard. By October, by which time its complement of Whirlwinds had increased, the unit was declared fully operational and re-designated No. 848 NAS at Hal Far as the first operational Commando helicopter squadron of the Royal Navy, and earmarked to embark

Wessex HC.2 XR507/BJ of No.18 Squadron flies over the Moselle wine region in West Germany during the annual Peg Out Exercise, May 1974



Continued from previous page

UNIT	BASE	WESSEX FROM-TO	VERSION	SERIALS
	Culdrose	Feb 68 - Oct 68	HAS.1	
	RFA ships	Apr 68 - Oct 68	HAS.1	
	Culdrose	Oct 68 - Apr 69	HAS.3	
	HMS Eagle	Apr 69 - Dec 69	HAS.3	XS126/E-142
	Culdrose	Dec 69 - 25/3/70	HAS.3	
829 NAS	Portland	Mar 1964 - Jun 69	HAS.1	XS864/DV-404
	(Home base)			
	Portland	Oct 66 - Oct 76	HU.5	XT848/RS-469
	Portland	Jun 69 - Jun 70	HAS.3	XS149/FF-403
	Portland	Aug 82 - Jan 84	HAS.3	XM837/GL-400
	(Home base)			
845 NAS	Culdrose	10/4/62 - Oct 72	Mk.1 (Commando)	XS117/A
	(Home base)			
	HMS Albion	Sept 62 - Sept 64	Mk.1 (Commando)	XP104/A-B
	HMS Bulwark	Sept 64 - Sept 65	Mk.1 (Commando)	XS154/B-V
	Culdrose	Sept 65 - Jan 66	Mk.1 (Commando)	
	Culdrose	Jan 66 - Aug 66	HU.5	XT456/N
	HMS Bulwark	Aug 66 - May 70	HU.5	XS507/B-C
	HMS Albion	May 70 - Apr 71	HU.5	XT453/A-K
	HMS Bulwark	Apr 71 - Sept 72	HU.5	XS483/B-F
	HMS Albion	Sept 72 - Oct 72	HU.5	
	Yeovilton	May 72 - Oct 86	HU.5	XT468/Y-D
	(Home base)			
	Dets to various bases/vessels	1972 - 1975	HU.5	XT456/F-N
	HMS Hermes	Mar 75 - Jun 75	HU.5	XS516/H-X
	Dets to various bases/vessels	1975 - 82	HU.5	XT470/H-L
	Yeovilton	July 77 - Aug 77	HU.5	XT470/Y-A
	Aldergrove (det)	Oct 77 - May 82	HU.5	XS513/Y
	Dets to various vessels	May - Jul/82	HU.5	
	Ascension Is (det)	Jul 82 - Jul 84	HU.5	
	HMS Illustrious	Oct 82	HU.5	
	Dets to various bases/vessels	1982 - Oct 86	HU.5	XS516/Q
846 NAS	Culdrose	20/7/68 - May 72	HU.5	XS496/CU-A
	(Home base)			
	HMS Fearless	4/10/68 - 17/10/68	HU.5	
	Dets to various bases/vessels	1968 - 1972	HU.5	XT480/RG-468
	RFA Engadine	Feb 69 - Mar 70	HU.5	
	Culdrose	Mar 70 - May 72	HU.5	XS507/CU-XC
	HMS Bulwark	Jan 72	HU.5	
	Yeovilton	May 72 - Dec 75	HU.5	XT461/VL-XD
	(Home base)			
	HMS Albion	1972	HU.5	XS492/A-VW
	Dets to various bases/vessels	1972 - 75	HU.5	XT468/TS-332
	Parentage of RFA Flts	May 75 - 17/12/75	HU.5	
	Yeovilton	1/4/76 - Jun 77	HU.5	XT465/VL-VR
	(Home base)			
	Dets to various bases/vessels	1976 - Jun 77	HU.5	XT765/VL-VN
	HMS Hermes	Jun 77 - Sept 77	HU.5	
	Yeovilton	4/10/78 - May 79	HU.5	XT451/VL-VL
	(Home base)			
	HMS Bulwark	18/5/79 - Dec 79	HU.5	
	HMS Hermes	21/6/79 - Dec 79	HU.5	
	Dets to various bases/vessels	Feb 79 - Oct 81	HU.5	XT451/B-VL
847 NAS	Sembawang	14/3/69 - 15/5/69	HU.5	
	(Home base)			
	HMS Albion (det)	16/5/69 - 28/5/69	HU.5	
	Dets to various bases/vessels	May 69 - 25/5/71	HU.5	XT761/J
	Culdrose	7/5/82 - 13/5/82	HU.5	
	(Home base)			
	SS Atlantic			
	Causeway det	13/5/82 - 9/6/82	HU.5	
	RFA Engadine det	13/5/82 - 9/6/82	HU.5	
	Port Stanley	9/6/82 - 17/9/82	HU.5	XT755/XX
848 NAS	Culdrose	7/5/64 - 20/1/65	HU.5	XS498/T
	(Home base)			
	HMS Albion	20/1/65 -	HU.5	
	Dets to various bases in FE	May 65 - Aug 66	HU.5	XS483/A-E
	HMS Albion	Aug 66 - Sept 66	HU.5	XS494/A-P
	Culdrose	Sept 66 - 8/9/67	HU.5	
	HMS Albion	8/9/67 - Jun 69	HU.5	XS491/A-L
	Culdrose	Jun 69 - Jan 70	HU.5	
	HMS Bulwark	Jan 70 - Aug 70	HU.5	XT760/B-VA
	Culdrose	Aug 70 - Mar 71	HU.5	
	HMS Albion	Mar 71 - Dec 71	HU.5	
	HMS Intrepid	Aug 71 - Dec 71	HU.5	
	HMS Albion	Apr 72 - Jul 72	HU.5	
	Culdrose	Jul 72 - Oct 72	HU.5	
	HMS Fearless	Oct 72 - Nov 72	HU.5	
	HMS Intrepid	Oct 72 - Nov 72	HU.5	
	HMS Bulwark	Oct 72 - Mar 73	HU.5	XT449/B-VS
	Yeovilton	Dec 72 -	HU.5	
	(Home base)			
	HMS Bulwark	Aug 73 - Mar 74	HU.5	
	Yeovilton	Mar 74 - Mar 75	HU.5	
	HMS Bulwark	Mar 75 - Mar 76	HU.5	XT761/B-VU
	Yeovilton	17/4/82 -	HU.5	XT482/WL
	(Home base)			
	RFA ships	Apr 82 - Aug 82	HU.5	XS495
	Yeovilton	Aug 82 - 30/11/82	HU.5	

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RN AIRCRAFT CARRIER FLIGHTS

HMS Ark Royal	Feb 70 -Jan 77 Jun 77	HAS.1 HU.5	XP117/R-056 XT473/61
HMS Eagle	Jan 69 -Jan 72	HAS.1	XM326/E-147
HMS Hermes	Feb 68 -Jun 70	HAS.1	XS871/H-265
HMS Victorious	1967 -1968	HAS.1	XM843/V-271

*Only the main deployments are given. Usually units return to base between deployments.

on HMS *Bulwark*, the RN's first commando carrier, and later re-equipping with the Whirlwind HAS.7. The advent of the dedicated assault helicopter had finally arrived. In June 1961 Royal Marines of No. 42 Commando from HMS *Bulwark* were landed in Kuwait by No. 848's Whirlwind HAS.7s to secure the country against Iraqi aggression. More units were formed on the Commando-configured Whirlwind; in December 1962 No. 846 NAS landed Royal Marines from HMS *Albion* to assist the Sultan of Brunei quell a revolt in his own country, an involvement that expanded into the Borneo campaign and eventually into the wider Indonesian Confrontation. These operations were to be the precursor of similar operations and further development by the Whirlwind's successor, the Wessex, which is the main subject of this account.

Another innovation introduced by the Whirlwind and destined to have a long-lasting effect on Westland's anglicisation of Sikorsky designs was the fitting of a turbine engine in the Whirlwind HAR.9 (RN), HAR.10/HC.10 (RAF) and HCC.12 (Queen's Flight). These versions were powered by the 1,050shp (783kW) Bristol Siddeley Gnome H.1000, fitted horizon-

tally and offset to starboard in an extended nose. The Gnome, a licence-built version of the US General Electric T58, produced 40 per cent more power than, and was one third of the weight of, the piston Leonidas.

With the foundations of the roles of anti-submarine warfare, plane-guard, rescue, communications and assault firmly established, mainly by the S-55 in both British and US services, the next step was consolidating what had been learnt, absorbing new technologies, adapting to the changing world situation but most important of all introducing these improvements in a better helicopter platform with a heavier lift capability. This was provided again by Sikorsky in the form of the S-58, better known in Britain as the Westland Wessex.

SIKORSKY S-58 - FIRST STEPS TOWARD THE WESSEX

As a follow on to its successful S-55 which eventually found its way into the inventories of various air forces and of civil operators in different roles around the world, Sikorsky developed the S-58 mainly in response to an industry-wide US Navy requirement for an Anti-Submarine

Warfare helicopter having more power, better lifting capacity and generally superior performance to its predecessors. The idea was to incorporate into one airframe the two different roles in anti-submarine warfare, those of search and strike, better known as hunter and killer. The same solution was by then also being used by US Navy fixed wing aircraft on anti-submarine duties.

Sikorsky had started design work on the S-58 as early as 1951. This was a risky venture since the previous year the US Navy had preferred the Bell Model 61, or Navy designation XHSL-1, which was designed specifically for anti-submarine duties. The Bell machine was equipped with the latest dipping sonar for submarine detection and could carry Fairchild AUM-2 Petrel lightweight homing missiles for underwater targets. Powered by a single 2,400hp (1790 kW) Pratt & Whitney R-2800-50 Double Wasp radial engine installed in the centre fuselage and which turned two interconnected fore and aft lifting rotors, the XHSL-1 had an autopilot that enabled it to hover motionless for long periods, a feature which is so important for dipping sonar operations. The first of three prototypes of the Bell offering flew in March 1953, one full year before Sikorsky's S-58.

However, the XHSL-1 proved disappointing. Its development was long and arduous since the machine suffered many teething troubles, the worst of which was vibration. After these had been cured, carrier tests that were carried out in March 1955

Wessex HC.2 XR509/BM of No.18 Squadron being folded and positioned by ground crew during a deployment exercise in Germany (A.W.Hall)



revealed even more problems. Though it performed well in the air, the XHSL-1's large size was not compatible with the aircraft carriers' elevators (unforgivable shortsightedness on the part of both Bell and the US Navy), and its noise level proved too high while in stationary flight, thus badly hindering the sonar operator's capability of identifying contacts. Due to these shortcomings the first production contract calling for 60 machines for the US Navy and 18 for Britain's Fleet Air Arm under MAP arrangements was cut back to fifty for the US Navy only. Though it entered service in 1957, the HSL-1 was used in a relegated mine-sweeping role, but by that time the Sikorsky S-58, which until then had been considered by the US Navy only as a back-up in case the HSL-1 failed, had become available.

Concurrently, Sikorsky, too, at the time was building a Double Wasp-powered (though twin-engined) helicopter for the US Marines. The huge S-56 was a 26-trooper which carried the USMC designation of HR2S-1 and ordered also by the US Army as the H-37A Mojave. In spite of its size - for a long time it was the largest and fastest helicopter on the western side of the Curtain - it was more conventional in design than the Bell HSL-1, though it featured a retractable undercarriage while the two engines driving a single 72-foot (22 m) lifting rotor were mounted in external nacelles. However, it was a success, especially owing to its capability of carrying bulky weights such as three Jeeps or a 105-mm howitzer and crew. This was fine for the US Marines and US Army, but the US Navy was less concerned with a bulky carrier than with a smaller machine capable of being carried on ships for anti-submarine warfare that could serve as the capable successor to the S-55.

The new S-58 incorporated several features that had first appeared on the S-55, including a nose-mounted single radial piston engine (in contrast to the S-51, which had the engine positioned under the rotor) and a raised flight deck, the latter in much

Wessex HC.2 XR509/BM of No. 18 Squadron being manhandled into the trees for camouflage during the same exercise as shown left after the tail and main rotor had been folded. (A.W.Hall)



Above: Wessex HC.2 XR509/N was one of the original 15 machines which formed No.18 Squadron in 1964, seen here at Odiham when Type D roundels were still in exclusive use in the RAF. Below: Wessex HC.2 XT671/W, No.72 Squadron still in the D Type roundels of the 1960s when this photo was taken. (APN)



the same manner as the S-55 and S-56, but the rest consisted of one of the largest fuselages to be designed until then for a single piston-engined helicopter. In fact the cockpit was located above and slightly forward of a spacious, box-like passenger/cargo compartment. Moreover, the S-58 was bigger and heavier than the S-55, and more powerful with its larger 1,525 hp nine-cylinder Wright R-1820 Cyclone engine driving larger-diameter, four-bladed main and tail rotors. A completely redesigned

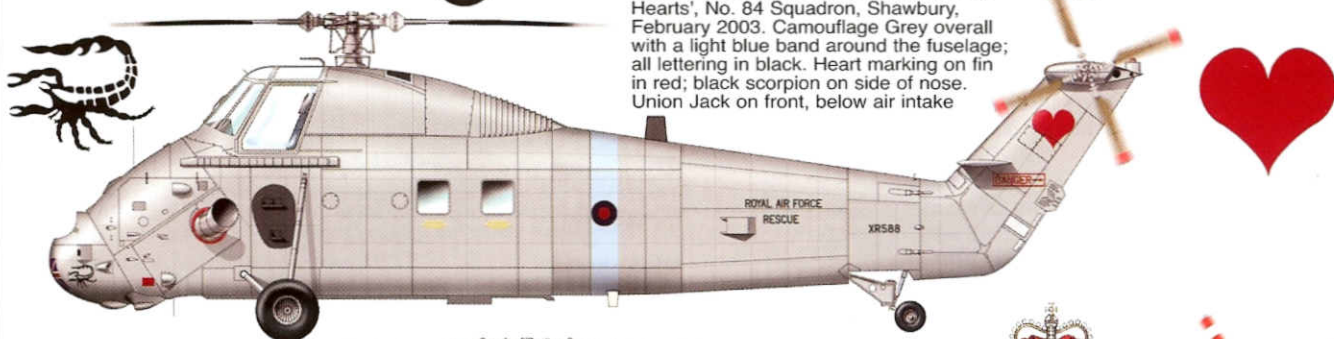
downward-sloping tail section with a three-point, tail-wheel landing gear rather than the quadricycle unit and high positioned boom of the S-55 enabled the machine to lay low on the ground, making it easier for the quick boarding and discharge of troops from its deep fuselage when used in the assault role or for embarkation of equipment when used as a general transport craft. The first example, designated XHSS-1 with Bureau Number 134668, flew for the first time at Sikorsky's plant in Bridgeport, Connecticut on 8 March 1954, the second and third XHSS-1 (Bu.Nos. 134669-70) flying soon after, followed by the first production HSS-1 on 20 September of the same year, the type beginning to reach US Navy anti-submarine squadrons in August 1955.

The nose-mounted engine installation in both the S-55 and S-58 allowed for easy and unobstructed access for servicing and removal at ground level via vertically-opening clamshell doors which in effect determined the bulged shape of the nose. In the S-58 the engine was mounted at an angle of 39 degrees so that its main transmission shaft passed between and behind the two flight-deck seats to the main reduction gearbox under the rotor hub. Angled as it was, the shaft in fact also passed through the top fore-part of the passenger/troop cabin. The internal noise level thus created was perhaps one of the reasons why the S-

Westland Wessex HC.2, XT602, No. 60 Squadron, Benson, 1995. Golden Yellow overall with all lettering in black; unit badge in black/white flanked by bars in same colours



Westland Wessex HC.2, XR588, 'Ace of Hearts', No. 84 Squadron, Shawbury, February 2003. Camouflage Grey overall with a light blue band around the fuselage; all lettering in black. Heart marking on fin in red; black scorpion on side of nose. Union Jack on front, below air intake



Westland Wessex HCC.4, XV733, The Queen's Flight, April 1987. Signal Red (BS381C/537) overall with Royal Blue (BS381C/106) and white cheatline; black serial. Union Jack on fin; Queen's Flight crest aft of forward side window



Westland Wessex HU.5, XS480/B, No. 486 NAS, Culdrose, January 1959. Devon Red overall, used for experimental application of temporary camouflage trials. Lettering is all white, with 'B' repeated on nose

Westland Wessex HU.5, XT484/RS/469, No. 847 NAS, on board the Royal Fleet Auxiliary vessel 'Resource', Mediterranean, November 1969. Matt Light Stone (BS.381C:361) overall with matt Olive Green (BS.381C:298) camouflage on top surfaces only. All codes and serials in white. Note 'seahorse' motif repeated on floatation gear



Westland Wessex HU.5, XT486/RG/468, No. 829 NAS, RFA Regent. Light Stone overall with Olive Drab camouflage on upper surfaces only; all lettering in white

S-58 did not achieve the expected success in the civilian passenger market.

Air cooling for the engine was provided by a series of large gridded apertures which surrounded the nose from side to side, inducting air by fans and expelling the hot air on the undersides. Exhaust from the Wright Cyclone was routed from the manifold to a single pipe which expelled it through a discharge opening on the port side.

The pleasing lines of the S-58 were built around a metal stressed skin airframe. In order to reduce overall length for easier storage, especially on ships, the rearmost part of the fuselage together with the fin, and tail rotor and horizontal stabiliser folded to port while the main rotors could also be folded to the rear for the same purpose. Fuel was carried in tanks along the fuselage floor, typical US Navy capacity being 255 gals (1159 lt).

Flying controls were hydraulically boosted and two independent systems were provided, the machine not being able to be flown manually. The centre of gravity of the S-58 did not permit the indiscriminate loading of cargo or troops, so that care was taken to distribute the weight towards the fore and rear part of the cargo area.

Having a fuselage length of 46 ft 9 in (14.25 mt), a height of 15 ft 11 in (4.85 mt) and a rotor diameter of 56 ft (17.08 mt), and a maximum loaded weight of up to 14,000 lb (6356 kg), the S-58 was not a small machine, but its Wright Cyclone could carry it at 122 mph (196 km/h) at sea level, the normal height at which most machines were expected to operate, although a service ceiling of 9,500 ft – 2896 mt was indicated. It had a range of 247 mls (398 km), very adequate both for naval machines operating from aircraft carriers as well as Army and Marines machines working to and from the battlefield to the rear areas.

The US Navy recognised that the Sikorsky offering promised better development prospects over the S-55 and ordered the new S-58 in large numbers (215 examples) as the HSS-1 Seabat in the anti-submarine role. A version developed by Sikorsky and equipped with automatic stabilizers and suitable for night and bad weather operation was designated HSS-1N, of which a total of 167 was built. These were equipped with Ryan AN/APN-



Above: Vantage view of the nose and underside of an HAS.1: XS877 H-265 from HMS Hermes in Malta on 2 May 1970. (G. Mangion) Below: Wessex HC.2 XR518 of No.22 Squadron in typical all yellow SAR scheme. No. 22 was the leading SAR unit of the RAF (APN)



97 doppler radar and a radar altimeter linked to the helicopter's autostabilizer which facilitated hover control for dipping sonar purposes. These helicopters operated either as hunters, with dipping sonar as the primary search aid, or as killers carrying homing torpedoes externally on the fuselage. Paired hunter/killer operations were possible, but it was more usual for the HSS-1s to search and to call upon destroy-

ers to make the attack when a target was located. In 1955 squadron HS-3 became the first USN unit to equip with the type, being followed by other anti-submarine squadrons of the USN.

One HSS-1F was fitted with two General Electric T-58 turboshaft engines as a prototype for the HSS-2 in January 1957, but no production followed. Four examples were HUS-1L special conversions for Antarctic use. The US Marine Corps ordered 516 HUS-1 Seahorse version for the utility role. An additional thirty-four HUS-1As carried provision for amphibious pontoon alighting gear, while four HUS-1Z special VIP models were made available to the Washington Executive Flight.

Subsequently in 1962 all US services S-58s received the unified basic designation of H-34, and in the US Navy the HSS-1 became known as SH-34G, the HSS-1N became SH-34J and the HUS-1L became LH-34D. The US Marines' model became known as the UH-34D, the HUS-1A as HU-34E and the HUS-1Z as VH-34D. The US Army, too, had received 359 of the

Wessex HC.2 XR588/D of No.28 Squadron. The unit was based at Hong Kong since January 1972





type, which it operated as the CH-34A Choctaw in a 16-seat transport role, the service also later receiving some of the US Marines' SH-34D but re-designated CH-34A once in the Army. The U.S. Coast Guard flew six search and rescue examples of the H-34 from 1959 to 1962, designated initially HUS-1G and later HH-34F.

In addition, the USAF received several ex-US Navy UH-34J and ex-US Marine Corps UH-34D which the service re-designated HH-34J and HH-34D respectively. A total of 523 was exported, of which 135 were licence-built by Sud Aviation in France, while others went to civilian operators as S-58C, making a total of 1,901 S-

Wessex HC.2 XT680/E belonging to Singapore-based No.103 Squadron unloads a 105 mm Howitzer in a jungle clearing gun position during exercises in South Malaysia

58s built. No turbine powered S-58s attained production status other than the later Westland-built Wessex, but many were re-engined with PT6T twin turboshafts (as that used in the Bell UH-1N) mainly for civilian use. Eventually, 17 air forces and navies flew versions of the S-58.

As far as the hunter/killer method of anti-submarine warfare was concerned, and in spite of the S-58's undisputed superiority over the S-55, in effect the US Navy remained more or less where it had been. Had the Bell XHSL-1, which could carry both ASW electronic equipment as well as weapons in one airframe been a success, the Sikorsky offering would have never even been considered by the US Navy as an anti-submarine helicopter. But the Bell product had encountered difficulties as already described and this paved the way for the emergence of the S-58 and its British development, the Wessex.

The Wessex was invaluable to British and Commonwealth troops operating in impenetrable jungle. HC.2 XS675/C, No.103 Squadron lifts a 103 mm Howitzer in south Malaysia to transfer it to a forward position





THE WESTLAND WESSEX

Also in the Royal Navy the paired hunter/killer method was employed for air-borne anti-submarine duties, the task being successfully carried out by the Westland Whirlwind helicopter. By the beginning of the 1950s the British Admiralty became conscious of the fact that for these two different roles to be carried in one airframe required a helicopter with enough payload to carry torpedoes and depth charges as well as heavy sonar equipment. The RN therefore took into consideration the trials carried out by the Bristol 173 on board HMS *Eagle* in November 1953.

This product by the helicopter division of the Bristol Aircraft Company had been developed following Ministry of Supply Specification E.4/47 for a twin-engined helicopter able to carry ten or more passengers. The Bristol Type 173 emerged as a tandem-rotor machine, and first took to the air in January 1952. By then RN interest was aroused for the possible use of the new helicopter for anti-submarine duties, and three prototypes were ordered to satisfy naval requirement NA.43 for convoy protection, general purpose, and the detection and strike capability against submarines. The existing design had to be shortened to meet carrier lift measurements and a longer undercarriage was fitted to enable weapons loading. The modified version, covered by Specification HR146, was capable of carrying sonar and two 18-inch (45.77 cm) torpedoes, and in this shape Bristol 173 Mk 1 XF785 took part in a three-day trial on HMS *Eagle*. (In parallel, Specification H150 was issued to cover a Royal Air Force version which in the event developed into the Bristol Belvedere general purpose, rescue and transport helicopter). By then the company type number for the RN version had been updated to Type 191, and in May 1954 an order was placed for 68 examples.

Weight problems, mainly related to the new Alvis Leonidas Major engines, became a problem since the estimated gross weight reached 17,000 lb (7718 kg), which was the maximum acceptable for many aircraft carrier lifts. Consideration was given to adopting the new Napier E156 turboshaft engine, which was lighter and more powerful. Although the engine later materialized

as the successful Napier Gazelle, transmission system problems, rotor interference and unavoidably rising costs led the RN to cancel the Type 191 programme in January 1956 in favour of a licence-built version of the Sikorsky S-58 by Westland. Sikorsky had already carried out a great deal of

Wessex HC.2 XR498/M, 72 Squadron embarks troops during exercises during the 1960s. For many years No. 72 was based at RAF Odiham

development work on the S-58, and by favouring the US type the RN saw a quick way of acquiring the helicopter type it required at a more predictable cost.

Westland had in fact begun to show interest in the S-58 as a larger and more versatile replacement of S-55 in the British forces back in 1955. The Royal Navy certainly reacted positively to a Westland proposal, the type having just entered squadron service with the US Navy in August 1955, and in due course a Naval specification based broadly on the company's proposal was issued. The type was therefore comparatively new when in 1956 Westland approached the US company to agree to a licensing agreement similar to the one that covered the S-51 and S-55. One problem which had been foreseen when Westland had first considered licence production of the S-58 was that there existed no suitable British piston helicopter engine in the power bracket of the S-58's 1,525 hp (1138



Wessex HC.2 XT679/G of No. 28 Squadron practices with the Hong Kong Police in 1976

Wessex HC.2s of No.84 Squadron for long were marked with UN markings, given the situation in Cyprus. The unit's XT687 is so marked, with UN in white over a light blue band over its normal camouflage

kW) Wright R-1820 Cyclone. Westland had long considered re-engining Sikorsky types with a gas turbine powerplant in lieu of their piston engine, and as Britain had spent so much effort in developing jet engines at nearly all power levels and in most spheres of aviation, it was logical that Westland decided to go straight for a gas turbine.

The deal with Sikorsky was concluded satisfactorily, even because the licence production of the previous two Sikorsky types had been executed with success by Westland. In April 1956 it was officially announced that the company was to build a Napier Gazelle-powered version of the S-58 under licence from Sikorsky and that the aircraft, to be known as Wessex, had been ordered by the RN for anti-submarine duties. Concurrently, Westland's Chief Test Pilot Lieut. W.H.'Slim' Sear proceeded to the USA for conversion training on the S-58 and to formally take delivery of a machine that was to serve as the basis for prototype work by Westland. The following June an HSS-1N Bu. No. 141602 from the Sikorsky production line – the 265th example – was shipped to Britain in a crated condition to serve as a pattern aircraft. Westland re-assembled the machine at the dockside facilities and mounted its Cyclone piston engine, with which it flew to Yeovil on 24 June 1956 as G-17-1.

Thus powered, it was flown for standard performance purposes and for later

No. 84 Squadron marked its SAR Wessex HC.2 with UN markings as well. Wessex HC.2 XV719 prepares to land near a UN site in Cyprus.



comparative testing figures with a turbine engine. In July 1956 G-17-1 was given British military serial number XL722 and retained for testing at the A & AEE Boscombe Down for three weeks and then at Lee-on-Solent for a week where, on 11 August it was displayed publicly for the first time. After having clocked some 70 hours with the Cyclone, XL722 was back at Yeovil where the engine was removed by Westland in December, the necessary modifications made and on 21 March 1957 an early version of the Gazelle NGa.11, which until then was delivering only 1,100 shp (821 kW), was installed.

The original Cyclone engine of the S-58 had been mounted inclined backwards at 39 degrees to connect with the rotor drive system, and the Gazelle was similarly fitted, thus simplifying matters by not necessitating any alteration in the position of the rotor head gearbox. Designed as a helicop-

ter engine, the Gazelle had the advantage of being able to be mounted horizontally, vertically or inclined, so that the angled attitude at which Westland installed it in the S-58 did not present any problem. The Gazelle was 630 lb (286 kg) lighter than the Cyclone and mounting it in the same position as the piston engine meant that the centre of gravity would be moved towards the tail more than could be possibly tolerated. The problem was solved by utilising the extra space in the engine bay left vacant by the smaller mass and narrower diameter of the Gazelle to store equipment normally stowed aft in the fuselage, restoring the C.G. Radio equipment and electrical apparatus thus found its way from its original bay aft of the main cabin to the extreme nose, with a platform separating the engine bay from the equipment compartment. With the Gazelle in place, more space became available also beneath and to the rear of the



ROYAL AIR FORCE SQUADRONS AND UNITS

Squadron	Base	From – to	version	Serial
18 Sqn	Odiham	27/1/64 – 31/12/64	HC.2	XR516/E
	Gutersloh	1/1/65 – 4/1/68	HC.2	XV722/B
	Acklington	5/1/68 – 4/8/69	HC.2	
	Odiham	4/8/69 – 31/8/70	HC.2	XV731-BZ
	Gutersloh	1/9/70 – 1/12/80	HC.2	XS674/BO
22 Sqn	Thorney Is.	5/76 – xx/76	HAR.2	XR588
	Finningley	1976 – 12/92	HAR.2	XR518
	St Mawgan	12/92 – mid-96	HAR.2	XT602
	Flights held for various periods at: Chivenor, Coltishall, Leconfield, Leuchars, Manston, Valley and Wattisham.			
28 (AC) Sqn	Kai Tak	1/72 – 5/78	HC.2	XR500
	Sek Kong	5/78 – 11/96	HC.2	XR508/D
	Det. Australia	9/87 (Op. Marlinga)	HC.2	
	Kai Tak	11/96 – 6/97	HC.2	XR515/B
32 (The Royal) Sqn	Northolt	1/4/95 – 31/3/98	HCC.4	XV733
60 Sqn (WOCF)	Benson	5/92 – 1/4/97	HC.2	XS674/R
72 Sqn	Odiham	8/64 – 5/4/81	HC.2	XR520/AB
	(Det at Manston)			XR518
	Benson	6/4/81 – 11/11/81	HC.2	XV728/AJ
	Aldergrove	12/11/81 – 31/3/02	HC.2	XR521/C
78 Sqn	Khormaksar	6/65 – 16/10/67	HC.2	XR522/O
	Sharjah	17/10/67 – 1/12/71	HC.2	XR500/A
84 Sqn	Akrotiri	3/82 – 1985	HC.2	XR522
	Akrotiri	1984 – 2/95	HU.5C	XS485
	Akrotiri	2/95 – 31/1/03	HC.2	XR588
103 Sqn	Tengah	11/72 – 1/8/75	HC.2	XT680/E
2 FTS	Ternhill	31/3/76 – 30/3/97	HC.2	XR505/WA
	Shawbury	late 76 – 30/3/97	HU.5	XS510/E
240 OCU	Odiham	30/12/71 – 1981	HC.2	XT674/BU
A & AEE	Boscombe Down	1963 onwards	HAS.1	XS863
ATS	Odiham	1/5/71 – 29/12/71	HC.2	XR499/BX
CFS (Helicopter Wing)	Ternhill	1963 – 31/3/76	HC.2	
HOCF	Odiham	1/7/67 – 30/4/71	HC.2	XT674/BQ
Muharraq SAR Flight	Muharraq	12/67 – 1/12/71	HC.2	XT601, XT604
Queen's Flight	Benson	25/6/69 – 31/3/95	HCC.4	XV732
RAE/RRE	Pershore/ Farnborough	1958 – Jan 1988	various	XL728 (HC.2 hybrid)
RAE	Bedford	1963 –	HU.5, HC.2	XS241, XR503
ETPS	Boscombe Down		HU.5	XS509
SARTU	Valley	1979 – 1/4/97	HAR.2	XV720
SRCU	Odiham	5/8/64 – 30/6/67	HC.2	XR505/N
WIFTU	Odiham	1/7/63 – 27/1/64	HC.2	
WOCF (72 Sqn C Flt)	Aldergrove	1997 – 31/3/02	HC.2 (Used 72 Sqn aircraft)	
WTF	Benson	3/11/80 – 30/4/82	HC.2	XS676/BV

A&AEE	-	Aircraft and Armament Experimental Establishment
ATS	-	Air Training Squadron
CFS	-	Central Flying School
ETPS	-	Empire Test Pilots School
FTS	-	Flying Training School
HOCF	-	Helicopter Operational Conversion Flight
MOD	-	Ministry of Defence
OCU	-	Operational Conversion Unit
RAE	-	Royal Aircraft Establishment
RRE	-	Royal Radar Establishment
SARTU	-	SAR Training Unit
SRCU	-	Short Range Conversion Unit
WIFTU	-	Wessex Intensive Flying Training Unit
WOCF	-	Wessex Operational Conversion Flight
WTF	-	Wessex Training Flight

engine. Suitably separated from the engine compartment by a double fireproof bulkhead, this space was utilized for an extra fuel tankage of 160 gals (727 lt) which gave the Wessex a much better range than the original S-58.

As in the case of the naval HSS-1 Seabat, the rear fuselage of the Wessex

complete with horizontal pylon and rotor aft of the tailwheel was hinged to be manually folded back on itself to port, reducing the overall length by 10 ft (3.05 mt). Similarly, the main rotor blades also folded backwards, both features reducing overall length from 65 ft 10 in. (20.08 mt) to 38ft 6 in. (11.74 mt) and width to a mere 13 ft

(3.97 mt). These characteristics have always been indispensable for the accommodation of naval aircraft on the crowded decks, confined hangars and lift sizes of aircraft carriers. The original Seabat had been designed with US Navy requirements in mind and during the anglicisation process the Wessex retained all the excellent mechanical and structural features of the basic S-58.

The Gazelle's intake aligned well to the S-58's narrow nose orifice, but retaining the clamshell doors of the S-58 necessitated cutting a large circular hole in the nose to accommodate the Gazelle's huge air intake. This was a temporary measure taken in order not to delay the test flight programme, as was the temporary retention of the clamshell doors. Twin pipes protruding from each side of the fuselage, below the cabin, expelled the Gazelle's exhaust gases. With this engine and modified air intake and exhaust system, WS-58 Wessex XL722 made its first flight at Yeovil on 17 May 1957 piloted by Westland's Chief Test Pilot Lieut. W.H. 'Slim' Sear.

The flight lasted 1 hour and 5 minutes, during which Lt Sear gave a full programme of the gas turbine Wessex handling characteristics. He had the Wessex off in less than 60 seconds from the start button – in contrast to piston engined helicopters which normally needed up to 10 minutes to warm up and attain the necessary revs. He hovered the machine, flew sideways and backwards, and took steep 2g turns in level flight runs. He carried out vertical climbs, auto-rotational descents and sudden stops, and this was all done with the early production Gazelle which Napier were already developing at their testing bench to attain 1,450 shp (1082 kW). The take-off weight of the Wessex on its first flight was 10,880 lb (4940 kg), the maximum weight of production machines being estimated to be 12,600 lb (5720 kg). It was a very promising first flight and augured well for the Wessex's future. Further test flying continued, and the turbine Wessex retained the good flying characteristics of the original machine since the control system and layout were not altered. Indeed, it was reported that the Wessex/S-58 was much easier to fly than the S-55, its Gazelle quieter than the piston engine of previous types, the response and effectiveness of the cyclic controls much better, and flying smoother also owing to aerodynamic improvements. The Wessex gave its first public flying demonstration for visitors at Yeovil in July 1957 during which Lt. Sear gave his convincing repertoire. The initial flight test programme was satisfactorily enough carried out to encourage further development.

Three pre-production examples were ordered at end-1957 for the RN and were built by Westland as XL727 to XL729, the first of which flew on 20 June 1958 with the Gazelle NGa.13. This improved version of the engine developed the promised 1,450 shp (1082 kW) and had already flown for the first time in XL722 on 13 September 1957. During this period, prototype XL722 received its new nose; the clamshell S-58 doors were dispensed with and replaced by side-opening doors, upper ones for the

The Royal Aircraft Establishment also had naval Wessex examples on its strength at various periods. Wessex HU.5 XS241 was one seen on display at Biggin Hill air fair. (APN)

equipment bay and lower ones to give access to the engine. The circular engine intake, of which at least three versions with various lip shapes were tried and flown by XL722, proved impractical since it faced the tarmac and was liable to suck in foreign objects, and was replaced by a grill which faced forward. XL727 was used to test the Wessex transmission system. XL728 first flew on 16 September 1958 and went to RAE Farnborough for further trials, which later also included engine and transmission development; it was eventually converted to become a *quasi*-HC.2 for the RAF. XL729 was flown on 6 October 1958 but was retained at Westland for vibration tests and was not delivered before 10 June 1959. These three pre-production machines, fitted with British anti-submarine equipment, flew with the XL722 nose, which was progressively modified until it reached its definitive shape. A further batch of eight pre-production machines was ordered, these carrying serials XM299 - XM301 and XM327 - XM331.

NAPIER GAZELLE GAS TURBINE

David Napier and Sons Ltd of Acton, West London, had long been a firmly established manufacturer of innovative piston engines, and whose products included the powerful Napier Sabre which powered the Hawker Typhoon and Tempest ground attack fighters of the Second World War. With the advent of alternative power for aircraft, Napier were not as quick to turn their attention to jet power as some of their contem-

poraries, and their products were not as advanced as some of their piston engines. But the company developed the Eland, Oryx and Gazelle gas turbine engines; the former powered such aircraft as the Vickers Varsity, de Havilland Ambassador and Convair 340. The Oryx was an interesting design in which the engine acted as a gas producer for helicopter rotor tips, but was not developed further. The Gazelle was a dedicated gas turbine helicopter engine. In 1960 Napier Aero Engines was formed as a separate entity from the company's other activities and in 1961 was incorporated into Rolls-Royce, who dropped the Eland but continued production of the Gazelle.



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The Napier Gazelle is a free-turbine engine designed exclusively for helicopter use. The term free turbine is used to describe a jet engine where the power shaft is not physically connected to the compressor shaft, and is used to produce shaft horse power in turboprop and turboshaft engines.

The free turbine is the most commonly used configuration of turbojet for helicopters, the main reason being its favourable torque/speed characteristics. Apart from its mechanical simplicity also resulting in the absence of a clutch in the output drive shaft, it also improves rotor speed stability, and does away with the fixed relationship between the rotor rotational speed and the engine rotational speed, unlike the fixed turbine. All turbine engines produce less vibration as the parts rotate rather than reciprocate as they do in piston engines. In helicopters turbine engines can therefore be moved upwards to a location adjacent to the rotor shaft and gearbox above the cabin, so doing away with heavy transmission shafts and leaving more useful space for cargo or personnel. The Gazelle was actually the only British helicopter-dedicated turbine until the arrival of the Rolls Royce Gem many years later.

Because of its intended application



Classic picture of Wessex HCC.4 XV733 of the Queen's Flight when based at RAF Benson (Adrian Balch)

for rotorcraft, the Gazelle was designed to be installed vertically, horizontally or inclined as required. It consists of a multi-stage turbo-compressor unit, exhausting to a power-turbine which is mounted co-axially with, but mechanically independent, of, the turbo-compressor unit. The final drive is taken through a reduction gearbox from the free power-turbine shaft, and the gases are exhausted to atmosphere through a bifurcated jet pipe. A torque-meter is incorporated in the reduction gearbox. An interesting feature is that the six flame tubes have a common casing. Single-lever control is provided. The Gazelle was chosen to power the Westland Wessex and Bristol Type 192 helicopters.

The early models of the Gazelle, NGa.11, developed 1,100 shp (821 kW), and the Wessex prototype flew with this engine. Pre-production and production machines were powered by the NGa.13 (Gazelle Mk 161) which delivered 1,450 shp (1082 kW). The latter aircraft received the designation Wessex HAS.1 to indicate their anti-submarine role.

IN SERVICE WITH THE ROYAL NAVY -WESSEX HAS. 1

The flight development and evaluation programme of the Wessex began in July 1958, soon after the delivery of XL727, XL728 and XL729. In the meantime the second batch of eight also became available. XM299, which was later to become a hybrid HC.2 by serving as the Gnome-powered Wessex prototype, undertook dipping sonar trials with Plessey Type 194 and 195M sonars systems, XM300, XM327 and XM328 tested the flight control system. XM301 commenced engine development flights, XM330 and XM331 took on weapons trials. XL727 was demonstrated at the SBAC show at Farnborough in September 1958. A number of machines was also sent to the RAE and to the A & AEE at Boscombe Down for further trials, while high altitude flying, cold weather flying and tropical trials were conducted in France, in Canada and in Malta/North Africa respectively. The pre-service trials period lasted till 1960, when the first examples began to be issued to the first Fleet Air Arm unit, No. 700H Naval Air Squadron at RNAS Cudrose in June of that year. This Flight, which since March 1957 had acted as an Intensive Flying Trials Unit, had introduced the Whirlwind HAS.7 into Fleet Air Arm Service. After the Whirlwind trials the flight was disbanded in September 1957, only to be reformed in January 1960 again at RNAS Cudrose charged to introduce the Wessex HAS.1 into RN service.

Apart from fleet handling and general operations for day and night ASW tactics, No. 700H's tasks also included the introduction for the Wessex of effective techniques in the use of the Type 194 Sonar (familiar, since it was the same as fitted in



the Whirlwind HAS.7 as the AN/AQS-4 licence-built in the UK by Plessey), and of mastering the more powerful turbine engine and automatic flight stabilisation assistance, especially at night. The unit was also tasked to fine-tune the Whirlwind procedure of transiting from hover to hover, that is, 'Jump Navigation', with the Wessex's new automated equipment. Unlike the Whirlwind, which it replaced, and the US Navy S-58 from which it was derived, the Wessex soon showed that it was capable of not only detecting a contemporary submarine under water but also of attacking it with homing torpedoes, all in one machine.

When the Wessex entered service, it was the Fleet Air Arm's first 'electronic' helicopter which made day and night, all weather sub-hunting a feasible proposition. This was made possible by a number of new systems. In the Whirlwind HAS.7 the pilot had to have a visual reference in order to hover; it could not be achieved over a featureless sea, which is very often the case. A manual device helped to partly achieve it, but it was an exhausting business, both mental and physical, with the pilots often reporting severe cramp in the left leg and the left hand. The Hawker Siddeley Dynamics power control system developed for the Wessex removed most of

the strain on the pilot for hovering by automating the procedure. Two other features of the 'electronic' Wessex were the Auto Stabilization Equipment (ASE) and simplex type Flight Control System (FCS) both developed by the British firm Louis Newmark. The ASE enabled the pilot to fly the aircraft hands-off, and the FCS gave him the capability of pre-programmed auto-hover which came into its own in lowering sonar or for winching during rescue operations. This no doubt encouraged the RN to place the first production orders for further Wessex HAS.1s which in the event reached a total for this version of 140, including the 11 pre-production machines which received the same type designation (but not including XL722 which was in effect an HSS-1N).

Inflatable float packs were fitted onto the wheel hubs, and these could be inflated into large ball floats in case the machine had to ditch. This feature was eventually adopted as standard equipment on Wessex machines required to operate over water. All HAS.1 models were delivered also with 15 trooping seats which were not installed but retained in HM dockyards should the Wessex be required to be quickly converted for trooping duties. This followed as a result of the Whirlwind's trooping limitations recog-



Wessex HCC.4 XV733 Queen's Flight in the flight's standard colour scheme of overall red with blue cheatline



No. 72 Squadron operated an SAR flight from RAF Manston. One of the flight's Wessex HC.2, XR518, practices rescue operations from a hilly region

nised during the June 1961 Kuwait crisis.

The success with which the Wessex trials were conducted by No. 700H, as well as the production tempo at Westland, directly contributed to the recommissioning during 1961 of three front line Fleet Air Arm units with Wessex HAS.1 while No. 700H itself disbanded in January 1962: No. 815 NAS at Culdrose in July, and of No. 819 at Eglinton and 814 NAS at Culdrose in October and November respectively.

Equipped with eight Wessex HAS.1s, No. 815 immediately embarked on HMS *Ark Royal* in November 1961 for the Mediterranean, becoming the first operational carrier-borne Wessex unit. Engine defects necessitated the return of No. 815 from Malta to the UK on board HMS *Victorious* for modifications, but by March 1962 the unit was able to return in the *Ark* to the Mediterranean and the Far East, where it remained for the whole of 1963. On the way back No. 815 disembarked at Aden to help with local disturbances there. In January 1964 No. 815 assumed an assault role and embarked on HMS *Centaur* sailing to Tanganyika to land No. 45 Commando of the Royal Marines to deal with a rebellion. It rejoined *Ark Royal* in June 1965 for another tour of duty to the Far East and Australia which lasted until June 1966, when the carrier and the unit remained in Home waters and until No. 815 disbanded in October 1966.

Wessex HU.5 XS507/ B-C of No.845 NAS, HMS Bulwark. No.845 is perhaps the best well known Wessex Commando unit



Westland Wessex HU.5,
XS479/B-VV, No. 848
NAS, HMS Bulwark,
Malta 1972. Olive Drab
overall with all lettering in
white; 'VV' repeated in
white on nose. Unit crest
on engine cowlings



Westland Wessex HU.5,
XS241, Royal Aircraft
Establishment,
September 1972. Light
Stone overall with Olive
Drab camouflage on
upper surfaces; white
flash along fuselage
sides. Black serial; RAE
crest on white rectangle
on nose



Westland Wessex HU.5,
XS480/VL-Z, No. 845 NAS,
July 1978. Olive Drab overall
with all lettering in white, code
'Z' repeated on nose; unit
crest on engine cowlings,
flanked by a white rectangle
with green checks

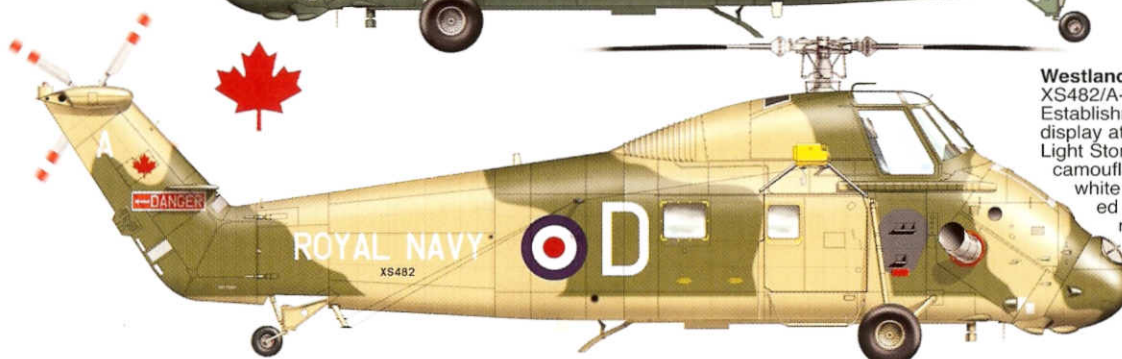


Westland Wessex HU.5,
HU.5, XT451/B-VL, No.
846 NAS, 'Bulwark
Rescue', 1980. Olive Drab
overall with lettering in
white; unit crest on engine
cowlings

Westland Wessex HU.5,
XT772, No. 781 NAS, July
1981. Emerald Green
overall with white cheatline;
lettering in white. Admiral's
pennant on nose; 781 NAS
crest on fin



Westland Wessex HU.5,
XS482/A-D, Royal Aircraft
Establishment, as seen during a
display at Farnborough, 1982.
Light Stone overall with Olive Drab
camouflage on upper surfaces;
white lettering with 'D' repeated
on nose. Serial in black;
red maple leaf on fin.
Currently preserved at
RAF Manston in an all-
yellow SAR finish



WESTLAND WESSEX SPECIFICATIONS

	HAS.1	HAS.3	HC.2	HU.5	HAS.31A,B
Engine	Gazelle Mk 161	Gazelle Mk 165	Gnome Mk 110/111	Gnome Mk 110/111	Gazelle Mk 162,165
Power	1,450 shp (1081 kW)	1,600 shp (1194 kW)	2x1,350 shp (1007 kW)	2x1,350 shp (1007 kW)	1,540 shp (1148 kW) 1,600 shp (1194 kW)
Overall length with rotor turning	65'10" (20.08 mt)	65'10" (20.08 mt)	65'10" (20.08 mt)	65'10" (20.08 mt)	65'10" (20.08 mt)
Fuselage Length	48'4" (14.74 mt)	51'2" (15.59 mt)	48'4" (14.74 mt)	48'4" (14.74 mt)	48'4" (14.74 mt)
Length rotor/tail retracted	38'6" (11.68 m)	38'6" (11.68 m)	38'6" (11.68 m)	38'6" (11.68 m)	38'6" (11.68 m)
Height	16'2" (4.93 mt)	16'2" (4.93 mt)	16'2" (4.93 mt)	16'2" (4.93 mt)	16'2" (4.93 mt)
Rotor Diameter	56' (17.07 mt)	56' (17.07 mt)	56' (17.07 mt)	56' (17.07 mt)	56' (17.07 mt)
Wheel Track	12' (3.66 mt)	12' (3.66 mt)	12' (3.66 mt)	12' (3.66 mt)	12' (3.66 mt)
Weight empty	7,600 lb (3477 kg)	8,900 lb (4041 kg)	8,470 lb (3842 kg)	8,470 lb (3842 kg)	7,600 lb (3477 kg)
Max take-off weight	12,600 lb (5715 kg)	13,600 lb (6124 kg)	14,000 lb (6356 kg)	8,470 lb (3842 kg)	12,600 lb (5715 kg)
Underslung load max.	4,000 (1814 kg)	n/a	4,600 lb (2088 kg)	4,600 lb (2088 kg)	4,000 (1814 kg)
Max Cruising Speed	133 mph (214 km/h)	121 mph (195 km/h)	121 mph (195 km/h)	121 mph (195 km/h)	124 mph (200 km/h)
Hover ceiling (o.g.e)	5,900' (1800 mt)	5,900' (1800 mt)	5,900' (1800 mt)	5,900' (1800 mt)	5,900' (1800 mt)
Overall ceiling	14,100' (4300 mt)	14,100' (4300 mt)	17,400' (5307 mt)	17,400' (5307 mt)	14,100' (4300 mt)
Range	390 mls (628 km)	320 mls (515 km)	478 mls (770 km)	478 mls (770 km)	390 mls (628 km)

No. 819 NAS was the second naval squadron to re-equip with the Wessex. Equipped initially with only four examples, No. 819 assumed the role of the Wessex headquarters unit at RNAS Eglinton in Northern Ireland, from where it carried out various exercises with the Joint Anti-Submarine School at Londonderry. It moved a few miles away to RNAS Ballykelly in February 1963 when Eglinton closed down, in the meantime undertaking occasional embarkation on HMS *Centaur*, USS *Essex* and on the Royal Netherlands Navy aircraft carrier *Karel Doorman*. In July 1963 it went aboard on HMS *Victorious* but the following September transferred to HMS *Hermes*. Ashore again in February 1964, it joined HMS *Lofoten* during October and November of that year. HMS *Lofoten* was a 1945-vintage LST transformed into a dedicated helicopter training ship, this involving the conversion of the deck forward of the superstructure into a landing platform. She had no hangar, the vessel being essentially a platform for practising landings at sea with minimum support facilities, and a deck to transport up to six helicopters. During 1965 No. 819 alternated between ashore at Ballykelly and aboard on *Ark Royal*, but the next three years were spent on RFA ships including *Tidepool*, *Olynthus*, *Oleander*, *Olna*, *Tidespring* and *Olwen* as well as on HMS *Lofoten*. In April 1968 it re-equipped with Wessex HAS.3s.

With its home base at Culdrose, where it received eight Wessex HAS.1s, No. 814 embarked on HMS *Hermes* for the Mediterranean in May 1962, returning to Home waters the following October but re-embarking again on *Hermes* for the Far

East the following month. In April 1963 it spent a spell on the Australian carrier HMAS *Melbourne* before transferring first to HMS *Hermes* in May, then to HMS *Victorious* in August 1963, and finally to HMS *Albion* in February 1964, the latter embarkation having been intended to be a troop landing operation in East Africa which was then cancelled. Reverting to *Victorious* and to the more familiar ASW role, No. 814 undertook two tours to the Far East until in August 1967 it re-equipped with Wessex HAS.3s.

The introduction of the Wessex in the Royal Navy inventory resulted in a steep increase in the number of aircrew required, particularly pilots proficient in turbine-powered helicopters, so that No. 705 NAS's piston-engined training programme on Whirlwinds became outdated. On 4 January 1962 No. 706 NAS was formed at RNAS Culdrose as the Helicopter

Advanced Flying Training Squadron from a nucleus of No. 700H NAS. It received eight Wessex HAS.1s, on which it converted helicopter pilots to the Wessex, gave specialist and advanced training for Wessex crews and provided operational flying training in the Commando role. Its B Flight was formed at the same base on 7 January 1964 with six Wessex HAS.1s and three Hiller HT.2s for trials in the Commando assault role on HMS *Bulwark*, but the flight's Wessex complement was incorporated into No. 845 NAS as soon as the ship arrived in the Far East in March. Although the main 706 NAS started to receive Wessex HAS.3s in July 1967, HAS.1 examples remained on strength even after the squadron's conversion to the Sea King HAS.1 in January 1970.

No. 737 NAS was another secondary squadron with anti-submarine training experience on Whirlwinds to form on



Markings carried by Wessex HC.2 of Cyprus-based No.84 Squadron that delivered Red Cross representatives at the Palestinian deportees camp at Haifa in January 1993

Wessex HAS.3 XS121/CU-582 of No.700H NAS flying over Cornwall's Goonhilly GPO satellite station in October 1968. No. 700H was instrumental in introducing the Wessex HAS.1 and HAS.3 into service.

Wessex HAS.1, the conversion taking place in July 1962 at RNAS Portland. It operated HAS.1s until re-equipping with HAS.3s in October 1967.

As more examples left the Yeovilton production line, two more Wessex HAS.1 frontline squadrons formed in 1964. During March No. 829 NAS, which had been dormant since 1944, received its first Wessex HAS.1s and Wasp HAS.1s at RNAS Portland to parent the Small Ships' Flights, that is, for deployment of helicopters on RN warships other than aircraft carriers. The Wasp went on smaller ships and frigates and the Wessex on board the Royal Navy's eight County-class guided missile destroyers. The latter vessels were built with a hangar and flight deck aft with the Wessex dimensions in mind, and the first of No. 829 NAS's Wessex HAS.1s embarked on HMS *Devonshire*, first vessel in the class. However, it was only in 1969 that the Wessex took over completely from the Wasp on the larger vessels, by which time the more capable Wessex HAS.3 had started to replace the HAS.1.

No. 820 NAS received eight examples of Wessex HAS.1 in September 1964 at RNAS Culdrose. In December it embarked on HMS *Eagle* and sailed to the Far East, returning to base in August 1966 after two tours. Then followed a period during 1966 and 1967 of detachments to HMS *Lofoten* and to various RFA vessels, including RFA *Olna* and *Tidespring*. Again on *Eagle*, No. 820 carried out another Far East tour from

Wessex HAS.3 from No.737 NAS based at Portland: XM328/PO-22 was used to train pilots and observers in anti-submarine warfare.



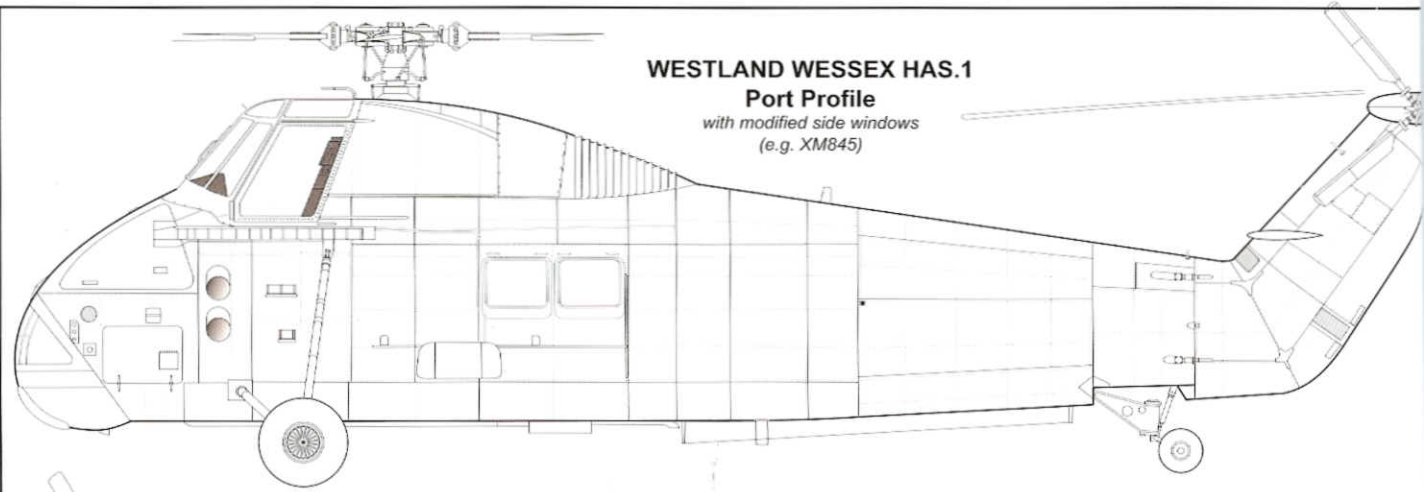
April 1967 to June 1968. The HAS.1s were replaced by four HAS.3s in May of the following year.

No. 826 NAS reformed at RNAS Culdrose in May 1966 with eight Wessex HAS.1s and in September deployed on HMS *Hermes*, starting on a Far East and Australia tour, returning to Home waters in September 1967. At home in Culdrose, No. 826 supplied aircraft from time to time to OL Class Fast Fleet Support Tankers *Olmeda* and *Olna* of the RFA, but this was interrupted by a tour on *Hermes* to the Arabian Gulf which lasted until February 1968, by which time its complement had been reduced to six machines. No. 826 re-equipped with Wessex HAS.3s in October 1968.

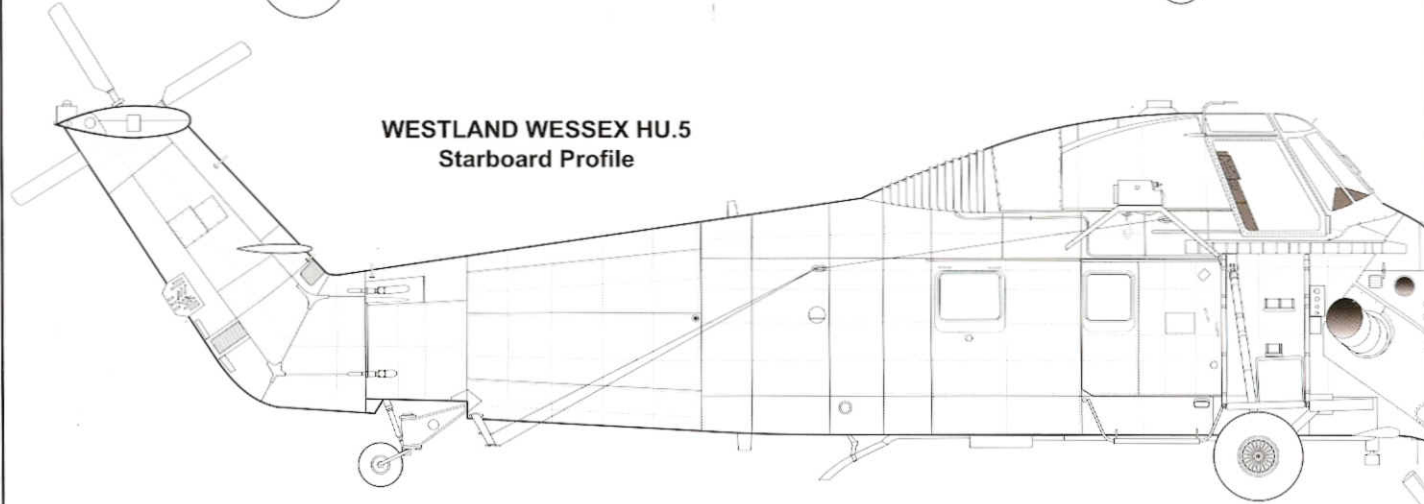
In later years HAS.1 examples

released from frontline units that had re-equipped with HAS.3 became the complement of second line squadrons. No. 771 and 772 NAS were two such late comers on the Wessex scene. No. 771 was reformed on HAS.1s to replace its ageing Whirlwind HAS.7s at RNAS Portland in November 1969 as the Search and Rescue Aircrewman Training Squadron (although it had already operated Wessex HAS.1s for a short period during December 1963 alongside its permanent main complement of Whirlwinds and Wasps). Following the imminent formation of No. 772 NAS at Portland, No. 771 moved to Culdrose in July 1974, where it eventually received Wessex HU.5s in March 1979, having been the last naval unit to operate the Wessex HAS.1.

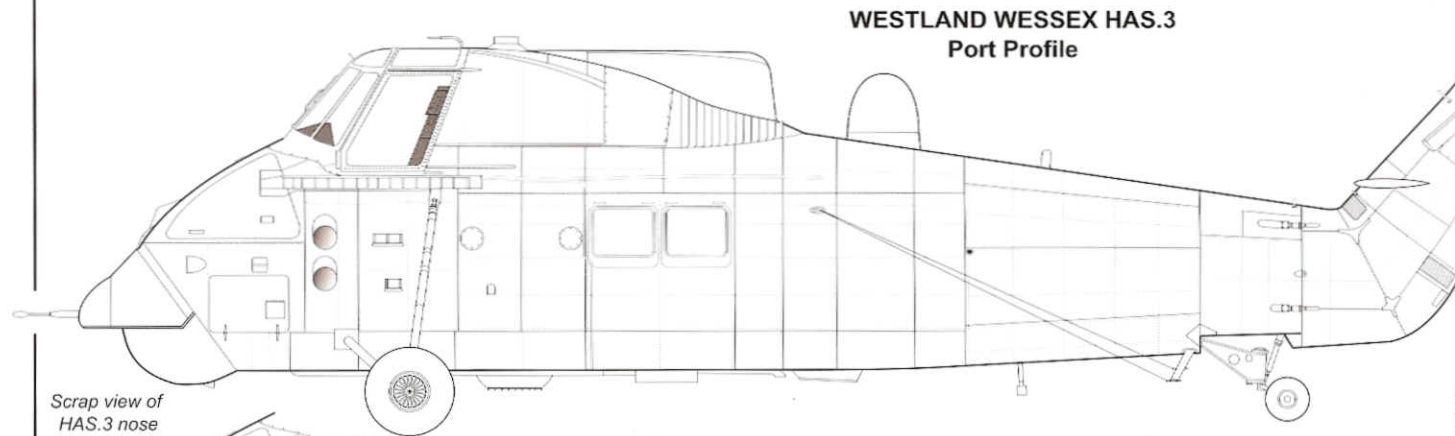




WESTLAND WESSEX HAS.1
Port Profile
*with modified side windows
(e.g. XM845)*

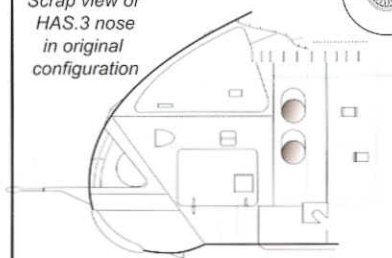


WESTLAND WESSEX HU.5
Starboard Profile



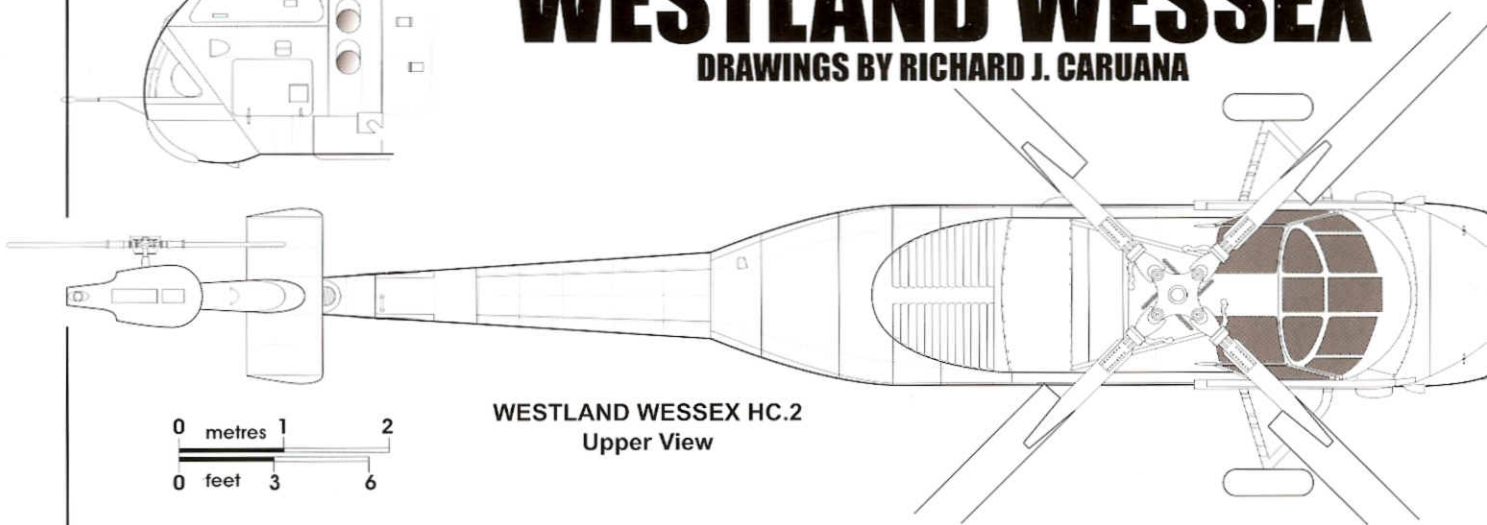
WESTLAND WESSEX HAS.3
Port Profile

*Scrap view of
HAS.3 nose
in original
configuration*

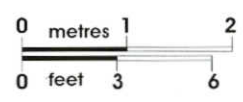


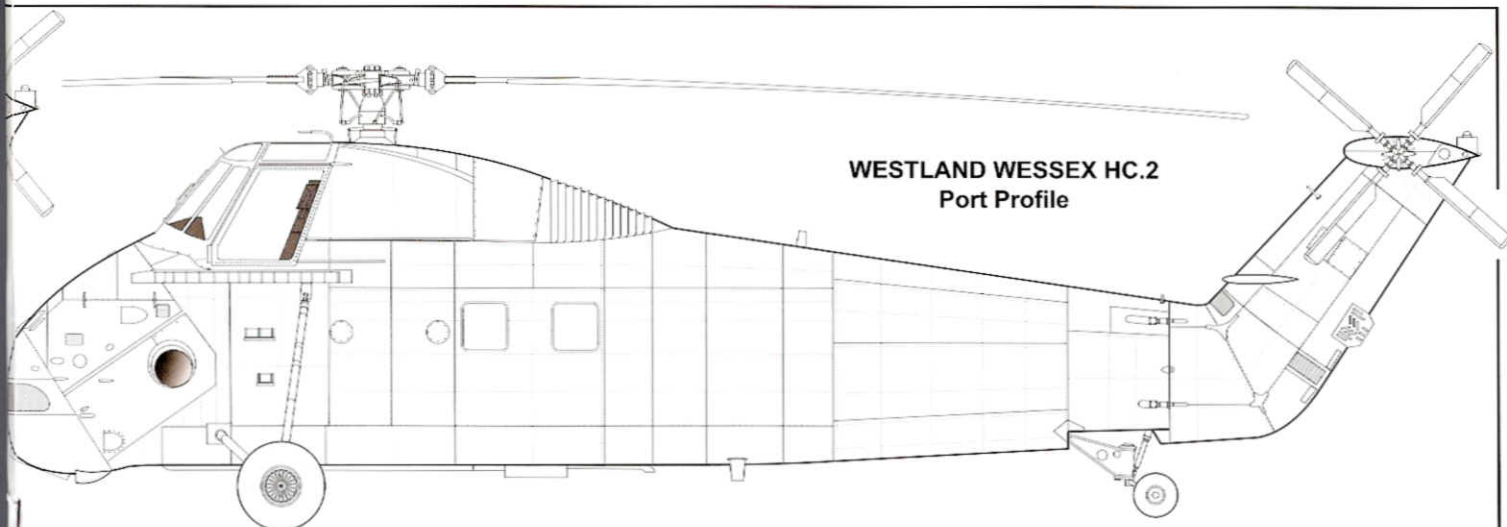
WESTLAND WESSEX

DRAWINGS BY RICHARD J. CARUANA



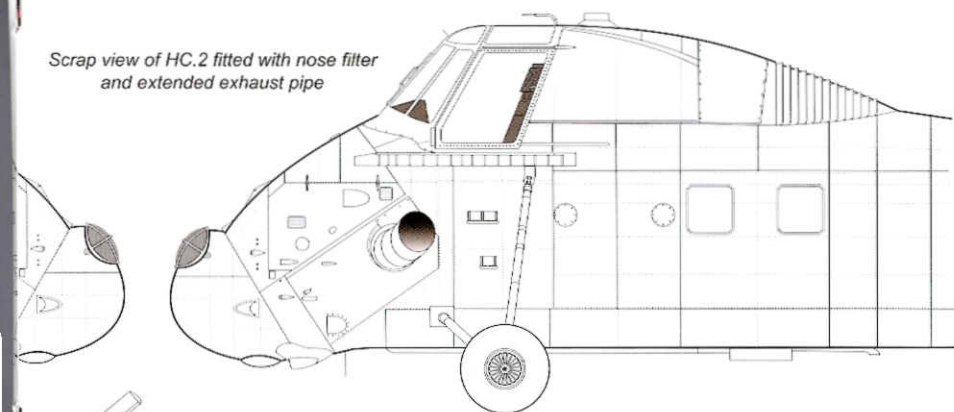
WESTLAND WESSEX HC.2
Upper View



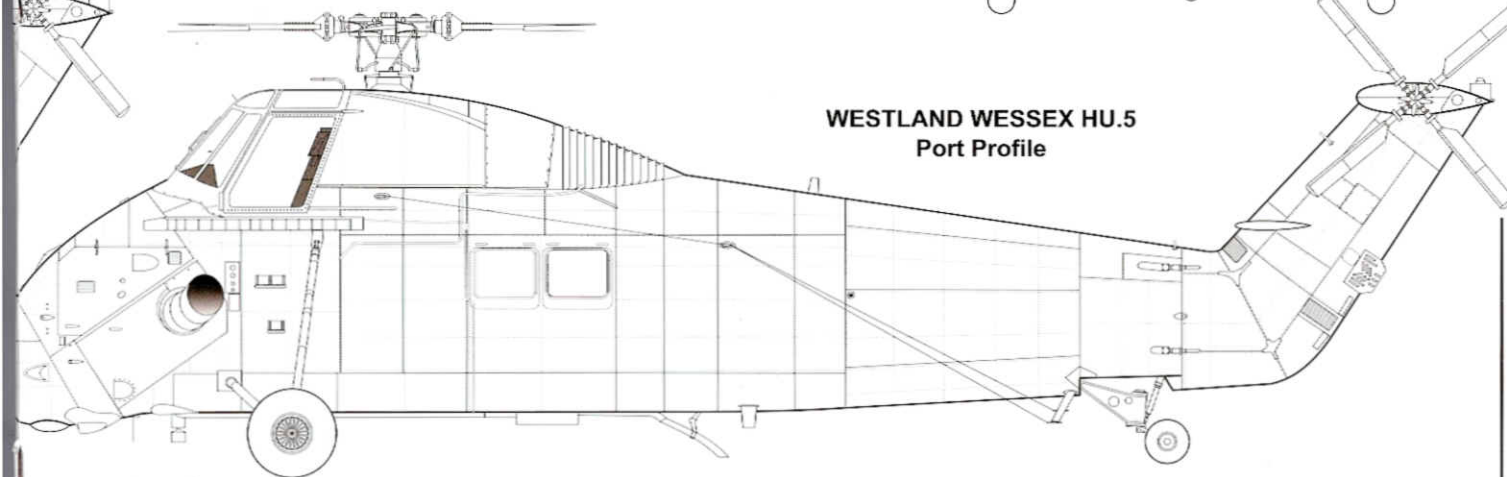
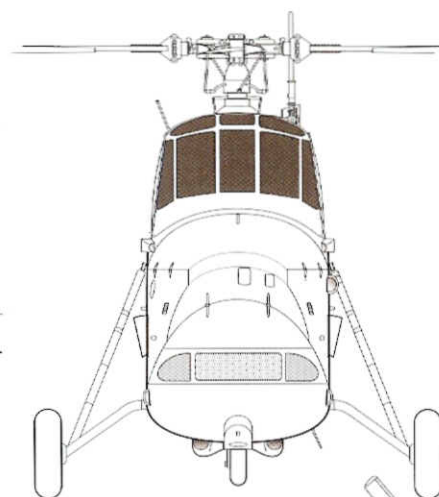


WESTLAND WESSEX HC.2
Port Profile

*Scrap view of HC.2 fitted with nose filter
and extended exhaust pipe*

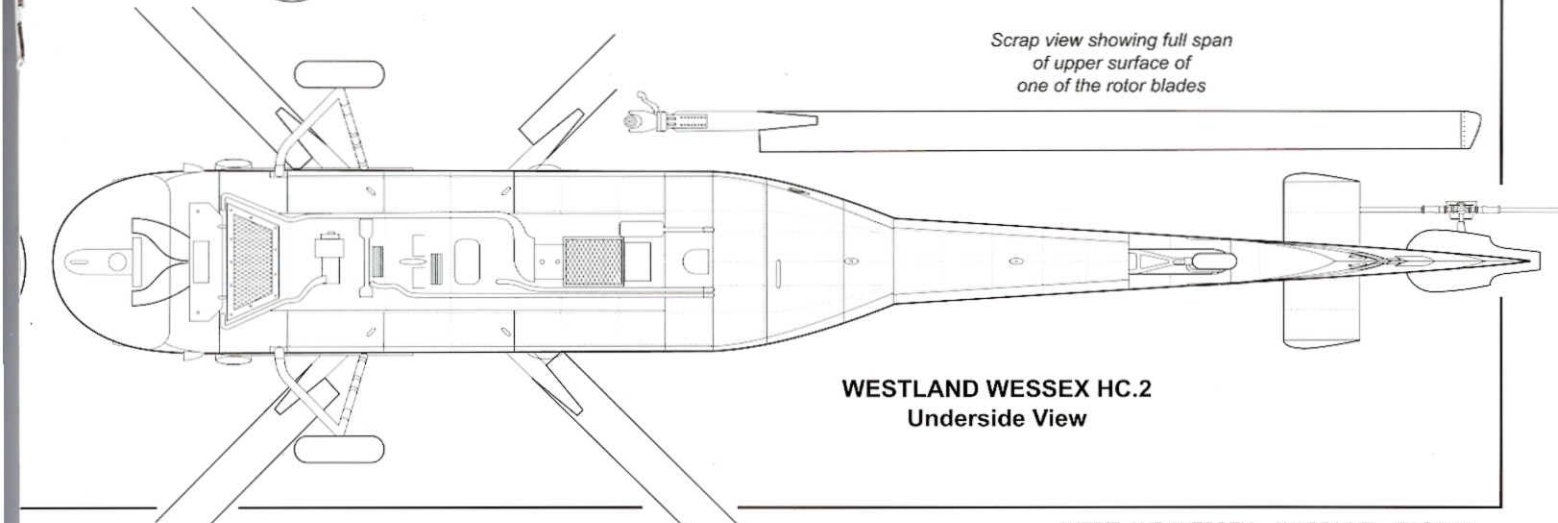


WESTLAND WESSEX HC.2
Front View



WESTLAND WESSEX HU.5
Port Profile

*Scrap view showing full span
of upper surface of
one of the rotor blades*



WESTLAND WESSEX HC.2
Underside View



No 772 was reformed as a Fleet Requirements Unit and SAR squadron on 6 September 1974 at Portland with six Wessex HAS.1s which it received from No. 771 NAS. In the SAR role it provided cover for the Portland area for British and foreign shipping, and in 1976 it re-equipped with Wessex HU.5s. SAR Wessex HAS.1s of the RN carried a crew of three: pilot, navigator/winch operator, and winchman/diver. The diver is particular to Royal Navy rescue helicopters, that is, not normally found in an RAF rescue crew. Having been originally conceived for plane guard duties from

aircraft carriers, RN Wessex rescue crews have invariably included a diver whose duty would be to jump into the sea directly from a moving helicopter (flying at around 5 to 10 knots) and dive underwater for possible survivors, if necessary even being temporarily left behind in the water while the helicopter leaves the rescue scene with a full load.

WESSEX COMMANDO Mk 1

The Fleet Air Arm had long been experimenting with using helicopters for the

assault role. In 1958 No. 848 NAS had achieved the distinction of being the first recognised Commando support unit after it was re-designated from No.728C NAS (Amphibious Warfare Trials Unit) at RNAS Hal Far Malta with Whirlwind HAS.22s. By March 1960 it had received the Whirlwind HAS.7 but this was a rather disappointing conversion and Westland, by then convinced of the Wessex's operational capabilities and drawing on experience gained during the Suez Campaign of 1956 when Whirlwinds were used to land troops in Egypt, produced proposals in 1961 for a 16-seat troop/eight stretcher armed version of the Wessex which could double up for general logistics. All sonar equipment and the automatic Flight Control Systems of the HAS.1, deemed unnecessary for the role, were removed (although the Auto-Stabilisation Equipment was retained). The sonar equipment was stored on the parent aircraft carrier and could be re-fitted in case an emergency arose where the Wessex had to be used in the ASW role.

By 1962 the Royal Navy possessed two Commando carriers. The Suez heli-borne troop landings had been carried out by Whirlwinds from conventional aircraft carriers HMS *Ocean* and *Theseus*. In the period that followed, two of the service's light fleet

Wessex HAS.3 XM838/PO-520 followed by PO-435 of No.737 NAS landing on RFA Engadine



carriers, HMS *Bulwark* and *Albion*, which were hardly considered suitable to carry the larger and heavier fixed-wing new generation jet aircraft then entering service, were converted to Commando carriers, a kind of floating fortress of Royal Marines together with Whirlwind and Wessex helicopters. *Bulwark* was converted during 1959-60 and *Albion* during 1961-62. All fixed-wing aircraft fittings (catapults, arrestor gear, etc) were removed and facilities for helicopter servicing increased. Besides being able to carry 16 helicopters, each carrier could also accommodate up to 900 Royal Marine Commandos apart from a ship's crew of over 1,000. Their assault capability was increased by the provision for carrying four LCA landing craft to complement the helicopters for shore landings. Moreover, the vessels could at short notice be used as ASW carriers, so that flexibility in their use was widened. The arrival of the Wessex coincided with the entry into service of both warships, but the Whirlwind HAS.7 Commando was still in service and in fact HMS *Albion*'s aircraft complement on her first commissioning tour in October 1962 consisted of mixed Whirlwind Commando HAS.7 of No. 846 NAS as well as Wessex Commando Mk 1s of No. 845 NAS.

The Commando Wessex Mk 1 could carry 2.75-inch rocket pods or four wire-guided SS.11 anti-tank missiles carried on a platform fitted to the main undercarriage struts each side and a 7.62 mm fixed forward firing gun (FFFG) attached to each platform (with the sight mounted in the cockpit on the port side). A General Purpose Machine Gun (GPMG) mounted on a swivel could be fitted to fire from the starboard side entrance door or window, a fitting eventually adopted for all Wessex models. The latter attachment was rather limited in use, for the helicopter had to adopt a banking attitude while firing, at the cost of presenting itself as an ideal target for ground fire. The main undercarriage wheels were protected by a metal guard, which also served to help support the weight of the weapons platform. Being basically a standard HAS.1, the Wessex Commando Mk 1 could carry an under-slung load of 4,000 lb (1816 kg) when not carrying troops or stretchers. A batch of 12 aircraft equipped No. 845 NAS which commissioned at Culdrose on 10 April 1962 as the first Wessex Commando unit, even though it retained its Whirlwind HAS.7s until June 1965. The squadron embarked on HMS *Albion* the following September and sailed to the Far East the following month. No. 845 was immediately involved in the Indonesian Confrontation against guerrillas operating in an attempted take-over of Brunei and for the following 30 months its overall light stone or light stone and green camouflaged Wessex Commandos operated in the support and SAR roles in a jungle environment. No. 845 took its Wessex Commando Mk 1 home on HMS *Bulwark* in September 1965, the *Albion* having already returned to the UK in February of the previous year.

It is to be noted that while No. 845 was fighting in the Far East with the Wessex Commando Mk 1, at Culdrose No.



Above: Wessex HAS.3 XS256 was one of only three new-built HAS.3s, the rest being conversions from HAS.1s Below: Wessex HAS.3 XP105/CU-67 in the markings of No.706 NAS (MAP)



707 NAS was reformed in December 1964 with its replacement, the new Wessex HU.5, as a Commando Advanced Flying Training Unit (CAFTU) to train future commando Wessex crews. For this reason, the Mk 1 version of the Commando Wessex was not followed up by further orders, the role by then being perfected by the more capable twin-turbine new version when the first examples were received by No. 845 NAS in January 1966.

ENTER THE RAF'S WESSEX HC.2 HAR.2 AND HCC.4

If the Royal Navy had been the prime mover behind Westland's venture to

licence-build the S-58 in Britain, it fell upon the Royal Air Force to push for a more potent version of the Wessex which in the event became the definitive model for both services.

The RAF indeed had a requirement of a powerful general duties tactical helicopter for troop carrying, cargo transport and casualty evacuation, and which could also be armed as a light ground support vehicle. This meant that the power offered by the existing Gazelle turbine was not sufficient to meet the requirement, and Westland looked for other sources of power. The company had already had experience with the Bristol Siddeley Gnome as fitted in the Whirlwind HAR.10 which it had flown in



Above: Wessex HU.5 XT487 of No.781 NAS's VIP Flight 'The Admiral's Barge' accompanied by another HU.5 XS523/LS-810 of the same squadron's SAR Flight flying over Lee-on-Solent May 1977
Below: This Wessex HU.5 XT764-PT belongs to No.707 NAS and carries the badge of the RNSPT



February 1959. The Gnome would not have been an improvement on the Gazelle, however, but two Gnomes coupled into one transmission box would. Westland therefore replaced the Gazelle in a standard HAS.1 airframe – XM299 – with two coupled 1,350 shp (1007 kW) Bristol Siddeley Gnome H.1200 Mk 110/111 turboshafts, with a combined power limitation of 1,550 shp (1156 kW) at the rotor head. The aircraft's airframe was strengthened, while the transmission system was redesigned with a more robust main gearbox to make use of the additional power. The mixed Mk 110 and 111 engine arrangement helped to give the aircraft power to operate better at altitude and in tropical conditions. The availability of two engines made for better safety with one engine out even when loaded, because Westland designed the engine layout and transmission system for each engine to operate independently, allowing single engine operation. The Ministry of Defence (Air) placed an initial order for 30 examples of this new version of the Wessex which was designated HC.2.

The first flight of XM299 brought to near HC.2 standard took place on 18

No.707 NAS created the Red Dragon Flight during the Prince of Wales's conversion training course on the Wessex from July to December 1974. Wessex HU.5 coded WA lands on HMS Hermes in December 1974 with HRH at the controls

January 1962, the main external differences from the HAS.1 being the large single exhaust pipe on each side of the nose in place of the twin smaller exhaust pipes of the Gazelle installation. It is also to be noted that the main cabin windows of the RAF HC.2 were smaller than those of the HAS.1 and of subsequent Navy models.



Initially, and in order to accelerate development, XM299, together with XL728 which was one of the original three pre-production Wessex HAS.1, flew with two coupled Gnome H.1000 Mk 101 turboshafts of 1,050 shp (783 kW) each and the strengthened transmission arrangement. The first true Wessex HC.2 prototype, XR588, effected its first flight on 5 October 1962 while the first two of the 30 production HC.2s, XR497 and XR498, first flew in February and April 1963 respectively and were used by Westland and the A & AEE as development aircraft from May to December 1963 until delivered to the RAF. The whole batch of 30 consisted of XR497 – XR511 and XR515 – XR529 and was delivered from 28 February 1963 to 1 December 1964. Three further production orders were placed for the RAF, the batches being XS674 – XS679 (these completed as Wessex HAR.2), XT601 – XT607, XT667 – XT681 and XV719 – XV733, the last two being completed as HCC.4, for a total of 74 that included XR588. The last delivered HC.2 was XV731 on 13 June 1968.

ROLLS ROYCE GNOME GAS TURBINE

The Rolls-Royce Gnome is a single spool turboshaft originally developed by the de Havilland Engine Company, and subsequently by Bristol Siddeley, as a licence-built version of the General Electric T58.

The T58 was a small free turbine powerplant originally built in 1955 in response to a United States Navy requirement for an engine weighing 400 lb (182 kg) and delivering 800 shp (600 kW) for a medium-sized helicopter. In fact, the US Navy had stated that their future helicopter plans would centre around the T58. In 1957 two T58s powered the first US jet helicopter, a modified Sikorsky S-58. This development was not followed up in the US, but operationally the outcome was that the Kaman UH-2 Seasprite flew with one T58 while other larger types as the Sikorsky S-61/H-3 series

Westland Wessex HU.5, XS518/X-P, No. 847 NAS, Falklands, 1982. Matt Olive Green overall with serials and codes in black. Note broken submarine kill marking in dayglo which is carried on the front of the air filter housing on the nose



Above: Westland Wessex HU.5, XL728, MoD (PE), Royal Aircraft Establishment, 1984. Oxford Blue/Signal Red/White finish with black anti-dazzle panel; RAE script in Oxford Blue, serial in white. RAE crest on a white rectangle on nose; nose emblem in dayglo orange, with blue detail



Westland Wessex HU.5, XS509, Empire Test Pilots School, 1983. Oxford Blue/Signal Red/White finish with lettering in white; black anti-dazzle panel



Westland Wessex HU.5, XT461/524/CU, 771 NAS, Culdrose, summer 1987. RAF Blue-Grey overall with gloss Red (BS.381C:538) nose section and rear fuselage boom. Lettering is white, thinly outlined in black on red areas; '25' repeated on nose. Unit crest on fuselage sides, 'Ace of Clubs' marking on engine cowling



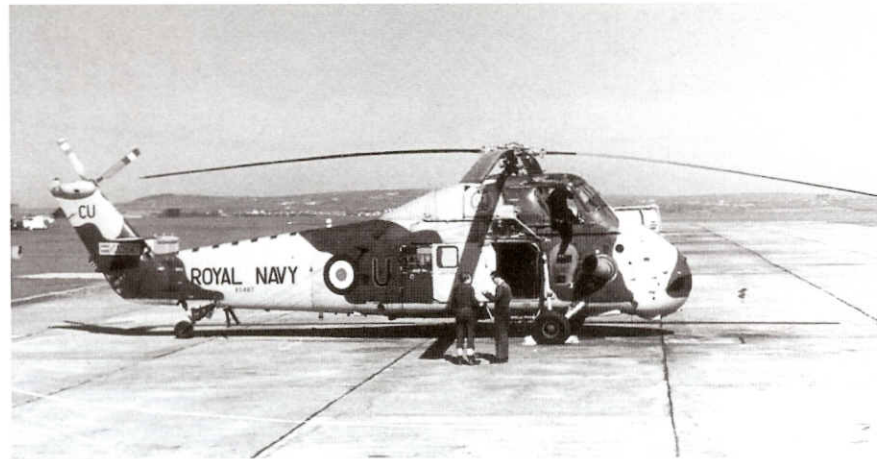
Westland Wessex HU.5, XV719/Joker, No. 84 Squadron RAF, Akrotiri (Cyprus), 1987. Dark Sea Grey/Dark Green camouflage with black undersides. Medium blue vertical band on fuselage; all lettering in black. Note Union Jack on front of filter housing



Westland Wessex HAS.31B, N7-212/822, No. 817 Squadron, Royal Australian Navy, January 1978. Gloss Oxford Blue/white finish with all lettering in white (except 'Danger' marking on fin which is yellow); '822' repeated in white on lower nose section, '22' also in white above nose. Unit crest on engine cowling fairing



Above: Wessex HU.5 XS507/ B-C of No.845 NAS, HMS Bulwark. No.845 is perhaps the best well known Wessex Commando unit. Below: Wessex HU.5 XS487/CU-U, No.707 NAS when the unit was still based at RNAS Culdrose



and Vertol H-46 had two T58s as their power unit.

As all this was happening, the de Havilland Engine Company acquired a licence to build the T58 engine in Britain. The result was the Gnome, which at 1,050 shp (783 kW) was first run on 5 June 1959. The engine was soon adopted by the Royal Air Force to power its Westland Whirlwind HAR.10 and HC.10 in 1961, in which year the de Havilland Engine Company was absorbed by Bristol Siddeley Engine Company. The H 1000 as anglicised by de Havilland/Bristol Siddeley and used in the Whirlwind had a Lucas fuel system and a Hawker Siddeley Dynamics control system. It was only 54 in long (137 cm) with a 2 sq ft (1,800 sq cm) frontal area and was mounted in the Whirlwind horizontally and offset to starboard in the nose which had to be lengthened by 30 in (76 cm). Weighing merely 500 lb (227 kg) and delivering more power than the piston engine, the Gnome enhanced the Whirlwind's performance considerably. In 1966 Rolls Royce took over Bristol Siddeley and continued to develop the Gnome. Versions of the Whirlwind powered by Gnomes also entered service with the Royal Navy as the HAR.9.

Reacting to an RAF request for a more powerful version of the Gazelle-powered Wessex helicopter, Bristol Siddeley had proposed in 1961 to couple two Gnomes to drive one shaft, thus giving the Wessex a

Wessex HU.5 XT482/CU-Q of No.707 NAS on a rocket-firing practice session

twin-engine capability. This installation resulted in the Wessex HC.2 powered by two coupled Gnome H.1200 Mk 110/111 turboshafts. This combination, giving twin-engine safety plus leaving in reserve considerable power, was also used on the Wessex HCC.4 for the Queen's Flight and on the HU.5 for the Royal Navy. Rolls Royce went on to further up rate the Gnome. Two H.1400 Gnomes, uncoupled, each of 1,400 shp (1044 kW) eventually also powered the Westland Sea King, while the latter's later versions are powered by two H.1400-1 of 1,660 shp (1238 kW)



each. The T58 itself is still in use. Current versions of the US Marines Boeing (previously Vertol) H-46 are powered by two T58s of 1,400 (1044 kW) shp each.

TRIALS AND CONVERSION UNITS OF THE RAF

Thus, during 1963, HC.2s from the Yeovil production line started to be delivered to the Wessex Intensive Flying Trials Unit (WIFTU) which was formed at RAF Odiham on 1 July 1963. On 5 August 1964 the Short Range Conversion Unit (SRCU) was formed also at Odiham to provide fixed and rotary wing training in techniques of Army co-operation flying. For this purpose, it received a number of Wessex HC.2 which it flew alongside Austers and the Twin Pioneer, absorbing the Belvederes of the Belvedere Conversion Unit in August 1966. The WIFTU became No. 18 Squadron in January 1964 while the SRCU disbanded in June 1967, but the Wessex element of the SRCU was reorganised as the Helicopter Operational Conversion Flight (HOCF) at Odiham on 1 July 1967 due to the importance given to the role of rotary craft in tactical support of the Army. The HOCF survived until 30 April 1971 when it was disbanded, only to re-emerge next day as the Air Training Squadron (ATS). The ATS was created for economy purposes when the introduction of the Puma HC.1 gave the RAF the opportunity to provide tactical support training for both Puma and Wessex crews at Odiham. The unit took over the Wessex HC.2s of the HOCF and beside continuing its Wessex training programme, it also provided crews for the new Puma units. On 29 December 1971 it disbanded to give way next day to No. 240 Operational Conversion Unit which formed with all ex-ATS Wessex and Pumas, as well as personnel.

No. 240 OCU became responsible for the operational training of all support helicopter crews using Wessex, Puma and Chinook helicopters. Its Wessex element was retired in 1981, training being then covered by the Wessex Training Flight (WTF) at Benson which formed on 3 November 1980 but which lasted until 30



Wessex HU.5s of No.848 NAS on board HMS Bulwark in Malta's Grand Harbour on 1 April 1975. (G.Mangion)

April 1982, conversion training on the type being undertaken by operational squadrons until the formation of WOFC in 1992.

Examples of the Wessex HC.2 had also been delivered in 1963 to the Helicopter Wing of the Central Flying School. Part of the Wing was transferred to No. 2 Flying Training School RAF Ternhill on 31 March 1976, moving to nearby RAF Shawbury later that year when Ternhill closed and became only a relief landing ground. Providing rotary instruction for the RAF, the school flew other types of helicopters, and a few (probably six) ex-Royal Navy Wessex HU.5 were also in use in 1979. Besides training RAF pilots, many Wessex pilots from other air arms passed through No. 2 FTS, the school's aircraft being identified by their red-orange fuselage band and chin. Following the restructuring of British military helicopter training of the mid-1990s, No. 2 FTS disbanded on 30 March 1997 and relinquished its Shawbury facilities as well as the *ab initio* helicopter aircrew training responsibility to the Griffin and Squirrel-equipped Defence Helicopter Flying School (DHFS), a tri-service civilianised organisation, while the Wessex training task was passed to a conversion flight within No. 60 Squadron at RAF Benson.

Marines of No.41 Commando prepare to be airlifted from HMS Hermes by Wessex HU.5s of 845 NAS to the Dhekelia area - one of two UK-administered areas in Cyprus, July 1974, during the Turkish invasion

WESSEX HC.2 IN SERVICE WITH OVERSEAS RAF SQUADRONS

No.18 Squadron, RAF Germany

It is noteworthy that when the RAF started to re-equip its frontline units with Wessex HC.2s, first priority was given to an RAF Germany unit. On 27 January 1964 the WIFTU became No.18 Squadron and, with its fifteen aircraft, was tasked to introduce the new type into RAF operational service. Since No. 18 was the first RAF Wessex squadron to form, it is only fitting to list the serial numbers of the unit's initial complement: XR449/A, XR515/B, XR501/C, XR502/D, XR516/E, XR504/F, XR517/G, XR506/H, XR507/J, XR508/K, XR518/L, XR519/M, XR509/N, XR510/O and XR511/P. The squadron's role was to pro-

vide support to the British Army at home from Odiham and, as it worked up to full operational readiness, it transferred to RAF Gutersloh in West Germany on 1 January 1965 to support the BAOR (British Army On the Rhine) which until then had been serviced by Whirlwinds. No. 18 remained in Germany until 1968 when it returned to Britain to serve as part of the Mobile Force for service where required. Two years later No. 18 was back in Gutersloh where it remained until 1 December 1980 when it returned to Odiham to disband and to reform the following year on Chinooks.

No.78 Squadron in the Middle East

In June 1965 Twin Pioneer-equipped No. 78 Squadron at RAF Khormaksar in the Aden Protectorate, RAF Middle East, was





the third RAF unit to receive HC.2s mainly for army support duties. The squadron was sorely needed for a wider variety of roles in this remote station, SAR becoming one of its most regular tasks. But by 1966 the squadron was mainly occupied in internal security operations. Civil war had been going on for a number of years in the neighbouring Yemen Republic and forays into the Protectorate were not infrequent, keeping Aden's air defences on the alert and even necessitating retaliatory attacks by RAF fighter bombers. Following a large scale outbreak of unrest which spilled over the border into Aden in 1965, No. 78's Wessex flew troops of the British Army's Argyll and Sutherland Highlanders into the Crater area of the Protectorate to regain control. Following the British withdrawal from troubled Aden, the unit boarded HMS *Intrepid* and moved to RAF Sharjah in the Trucial States (more or less the predecessors of today's United Arab Emirates) as part of Air Forces Gulf on 17 October 1967 for Army support duties. No. 78 disbanded on 1 December 1971 following the total withdrawal of British forces East of Suez.

Muharraq SAR Flight

Also in the same Arabian Gulf area, the Muharraq SAR Flight was formed in December 1967 at RAF Muharraq, in Bahrain, commencing SAR operations on dawn-dusk standby in January 1968 with two Wessex HC.2s, XT601 and XT604. The Flight was part of the Communications and SAR squadron which also included two Andover transports and which fell under the overall command of the Air Forces Gulf. Apart from their usual markings, the unit's two all-yellow Wessex carried an inscription in Arabic, which meant 'rescue

Above: Carrying out field maintenance on Wessex HU.5 XS513/Y of No.845 NAS in northern Norway during the annual deployment to Bardufoss, in February 1978. Below and bottom: Wessex HU.5 coded CU-C of No.846 NAS newly hand-painted in white distemper paint for camouflage in preparation for exercises in Norway. With the Exercises over: Wessex HU.5 of No.846 NAS having its distemper camouflage paint removed with floor brushes and a water hose. (A.W.Hall)



from the sea', for the benefit of the locally-engaged personnel and the local population needing its services. The operation of the two Wessex HC.2s lasted until the Flight's disbandment in 1971.

No.84 Squadron in the Near East

Another overseas unit which received the Wessex HC.2 was No. 84 Squadron. This unit had spent most of its service life in the Near, Middle or Far East, so that when reformed as a Whirlwind HAR.10 unit on 17 January 1972 with an SAR role, true to tradition it was based at RAF Akrotiri, in Cyprus, with a detachment at Nicosia. It was not before ten years, however, that yellow-painted Wessex HC.2s became available to replace the Whirlwind in March 1982. In 1983 the squadron and its HC.2s, as part of the Multi-National Force, became fully committed to rescue and support duties to the British contingent in Beirut, Lebanon, after that country's invasion by Israel. In 1985 the HC.2s were replaced by five essentially similar ex-Royal Navy Wessex HU.5s. These had their weapons platforms removed, fitted for carrying extra

Wessex HU.5s of 845 NAS from HMS Hermes were used to transport evacuees from Kyrenia, Cyprus in July 1974 during the Turkish invasion of that country

fuel tanks for a longer radius over water, painted dark grey/dark green, and designated HU.5C for their particular service in Cyprus. Four of these aircraft were quickly given playing card ace motifs, a tradition carried forward from the time when the unit flew Bristol Brigands in the Far East. The Wessex were marked as follows: XS498 'Joker', XS485 'Hearts', XS518 'Diamonds' and XT479 'Spades'. XT463 remained without a nickname, while XS518 crashed on 4 November 1986 and was replaced by another HU.5C XS517. The squadron consisted of two flights, A Flight engaged on general SAR within the Nicosia Flight Information Region, particularly for the local RAF and visiting RAF units using the armaments range, and B Flight assigned to light transport support for UNFICYP, the UN peacekeeping force in Cyprus. In fact until October 1986 No. 84 formed part of the British contribution to the UNFICYP, while after that date the squadron's involvement with the UN became limited to medical and casualty evacuation.

The HU.5Cs gave a decade of sterling service to the squadron and in February 1995 they were replaced by five Wessex HC.2s released from squadron service in the UK and painted in an overall grey with low visibility markings. These carried for-

ward the tradition of naming their aircraft after playing card ace motifs as follows: XR504 'Joker', XR588 'Hearts', XS675 'Spades', XT680 'Diamonds' and XV730 'Clubs'. When on 31 January 2003 the Wessex was retired from No. 84 Squadron's service it had four Wessex HC.2s on strength, XR504 having been retired in 2001 and placed in storage. The final sortie of the Wessex was a flypast over Akrotiri flying the RAF Ensign followed by a display by the Commanding Officer, having fallen upon No. 84 Squadron to draw the stage curtain on a 40-year long RAF front-line career of the Wessex. The four aircraft were returned to the UK inside a civilian An-124 transport aircraft. It is to be noted that one of the four, XR588, was the first Wessex HC.2 prototype and had first flown 41 years before in October 1962. Until new Griffin HAR.2 replacements arrived in June 2003, three Sea King HAR.3 of No 203(R) Squadron flew over to Akrotiri to fill the gap.

No.28 (AC) Squadron in the Far East

No. 28 (AC) Squadron was one of the RAF first line squadrons to eventually receive Wessex HC.2 released by the disbanded squadrons. In January 1972 eight sea-freighted Wessex aircraft arrived in Hong



Wessex HU.5 XS516/H-X of No.845 NAS, HMS Hermes, air lifts supplies from the fleet auxiliary RFA Retainer in March 1975

Kong harbour for No. 28 (AC) Squadron at RAF Kai Tak and by the end of July had replaced all the unit's Whirlwind HAR.10s. In May 1978 No. 28 moved to RAF Sek Kong in the New Territories, which also formed part of Hong Kong colony, when Kai Tak international airport became too overcrowded.

RAF Sek Kong was a newly-inaugurated, specially-built base for Wessex operations where No. 28 was kept extremely busy policing and patrolling the hundreds of islands and the peninsula of mainland China that formed the Colony. During the closing months of the Vietnam conflict, these helicopters worked around the clock to supply food for some 3,400 refugees on the 'Huey Feng', which was one of the numerous ships which sought asylum in Hong Kong.

At Sek Kong No. 28 shared the facilities with the Westland Scouts of No.660 Squadron, Army Air Corps, which supported the co-located Gurkha Regiment. No. 28 continued with its main task of supporting the army garrison in Hong Kong, including illegal immigrant patrols, with a secondary SAR role. Hong Kong was a major overseas base for the Gurkhas and all basic training was done there. The Wessex was an important element in the air mobility part of the training, transporting troops, supplies and ammunition to outlying ranges and outposts around the territory. During exercises with the Gurkhas, the Wessex HC.2s were fitted with door-mounted machine guns to provide some form of air offensive capability. In September 1987 No. 28 sent a 2-ship Wessex detachment for four weeks to Australia in support of Operation *Maralinga*, the radiological survey of the old atomic bomb test sites. After the assignment the two aircraft returned to the UK rather than to Sek Kong, these being replaced by two Wessex HC.2s of Cyprus-based No. 84 Squadron which had changed its HC.2s for ex-Royal Navy Wessex HU.5Cs. By then No. 28's eight Wessex HC.2 complement comprised XR522/A, XR515/B, XT675/C, XR508/D, XT605/E,



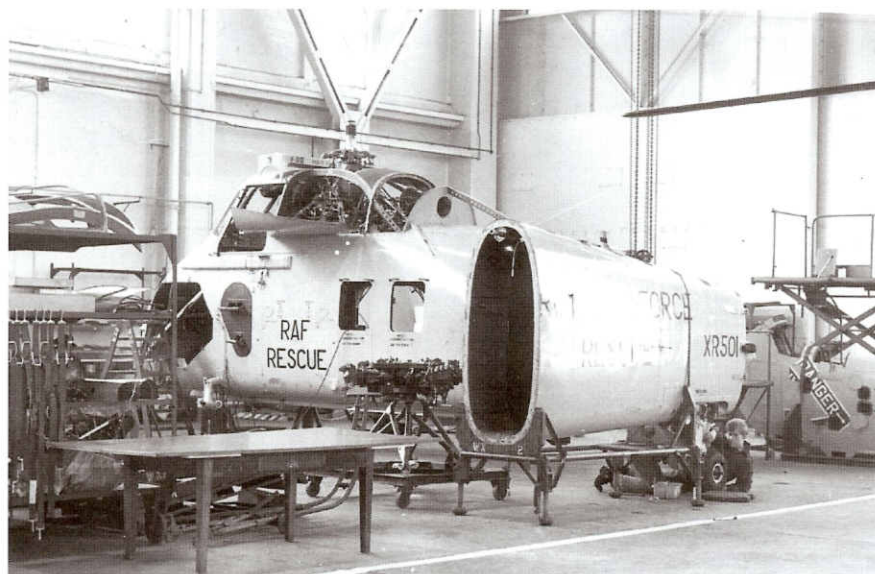
XT667/F, XT673/G and XT678/H. Eventually XR508/D was returned to the UK in December 1994, while XT667/F was lost in tropical storm *Becky* during an SAR mission on 17 September 1993.

Towards the approaching date of 30 June 1997 marking the handing over of Hong Kong Colony back to the People's Republic of China, No. 28 left Sek Kong on

the military base's closure in November 1996 – the last remaining RAF station in mainland Asia – and moved back to Kai Tak International Airport, which became its base. Rundown of the squadron personnel started in March until the unit's disbandment in early June 1997. On 3 June 1997 the six remaining Wessex helicopters of No 28 Squadron made a final flight around Hong Kong, having been the last RAF squadron there. Its Wessex aircraft, which were 65 per cent owned by the Hong Kong Government, were formally handed over to the Uruguayan Air Force at Kai Tak, following which they were sea freighted to Uruguay on 16 June.

No. 103 Squadron

In November 1972 No. 103 Squadron, which had been flying helicopters from Singapore since 1963, exchanged its Whirlwind HAR.10s for Wessex HC.2s at RAF Tengah, the last Whirlwind departing during December. During that period No.103 operated as part of the Australian,



Wessex HC.2 XR501 of 22 Squadron being overhauled at RAF Shawbury. At the time this picture was taken most of the Wessex aircraft that passed through the Maintenance Unit for deep servicing were almost entirely rebuilt from the original airframe and engine. (A.W.Hall)

New Zealand and UK (ANZUK) Force under tri-national command, its main role consisting of supporting the armies of these three nations which at that time were stationed in Singapore. In January 1975 the Squadron reverted to direct UK national command providing support to the Gordon Highlanders, Royal Artillery and the School of Infantry Jungle Warfare at Tengah until it was disbanded on 1 Aug 1975.

HOME UNITS

Northern Ireland: No. 72 Squadron

A former famous Battle of Britain fighter unit, No. 72 Squadron became a rotary wing unit in 1961 at RAF Odiham when it started to operate the Belvedere HC.1. After unsatisfactory experience with the type, No. 72 became the second RAF squadron to convert to Wessex HC.2s in August 1964, maintaining an SAR detachment at RAF Manston. On 16 April 1981 it moved its main base from Odiham to RAF Benson and on 12 November 1981 it transferred base to RAF Aldergrove in Northern Ireland in support of the Security Forces and where the unit assumed a secondary SAR role. No. 72 did in fact have previous experience of Northern Ireland since it had first deployed there temporarily in 1969 when the Troubles had flared up.

From 1991 No. 72 also operated a small number of Puma HC.1 alongside the

Wessex HU.5s and Sea Kings flypast over the ships in the Solent during a rehearsal of the Jubilee Fleet Review, June 1977

Wessex. In March 1997, as a result of the withdrawal of RAF Puma and Chinook squadrons from Germany, the Puma Flight of Laarbruch-based No.18 Squadron moved to Aldergrove to become a flight of No. 72. From then onwards the squadron always operated four or five Puma HC.1s alongside its dozen Wessex HC.2s. Also in 1997 No. 72 assumed the role of Wessex Operational Conversion Flight (WOCF) upon No. 60 Squadron's disbandment, the latter having on its part inherited the role when No. 2 FTS was disbanded and been replaced by the DHFS. No. 72 Squadron was then organised into three flights: A Flight flew the Wessex, B Flight flew the Pumas and C Flight was the WOCF obviously with Wessex. The WOCF, which had one operationally-capable Wessex aircraft assigned to it, ran courses to cover pilot, navigator and crewman positions for the benefit of No. 84 Squadron in Cyprus and of No. 72 Squadron itself, for those students who would have come through the DHFS course.

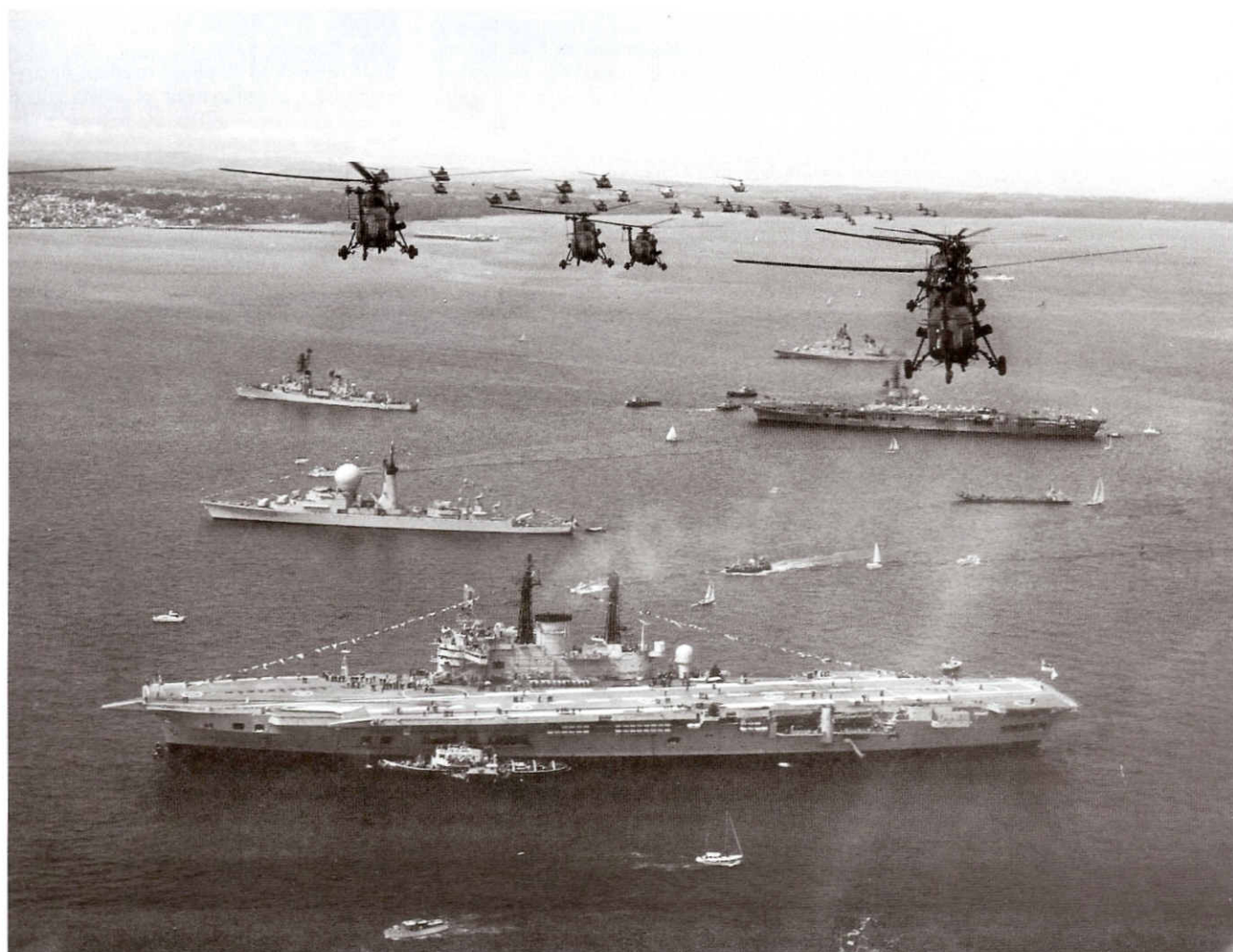
As from 1 April 2000 the Wessex HC.2s of No. 72 Squadron came to form part of the Joint Helicopter Force Northern Ireland (JHF[NI]), which was an element of the overall UK Joint Helicopter Command formed in 1999. JHF[NI]'s task was to provide unhindered freedom of movement of reinforcements in the province as well as trooping, surveillance and SAR. JHF[NI] was not, however, an exclusive Wessex unit, and in fact it comprised No. 72's A and B Flights with Wessex HC.2s and Puma

HC.1s respectively, No. 230 Squadron with Pumas as well as No. 665 Squadron of the Army Air Corps with Gazelle AH.1s.

Following the 1998 Good Friday Agreement signed towards achieving peace in Northern Ireland, Wessex flying started to be restricted to a minimum as a desire to support the normalisation process. On 31 March 2002, after more than 30 years of sterling work in Northern Ireland, No. 72 Squadron disbanded at Aldergrove, its Pumas going to an enlarged No. 230 Squadron and the Wessex withdrawn from service, the unit becoming the last UK-based Wessex-equipped squadron. No. 72 Squadron's final Wessex HC.2 line-up was as follows: XR497/F, XR525/G, XV721/H, XT676/I, XV726/J, XR511/L, XV723/Q, XT668/S, XR506/V and XR498/X. Four of these (XR497, XT668, XV721 and XV723) found their way to the Uruguayan Air Force and XT676 to the Uruguayan Navy during 2002 and 2003.

SAR Specialists: No. 22 Squadron

No. 22 Squadron had been reformed as an SAR unit at RAF Thorney Island in 1955 and became the premier unit in that role in the RAF. It initially received Whirlwind HAR.2 and in May 1976, after flying various versions of the Whirlwind, it started to re-equip with Wessex HAR.2s, though the last Whirlwind HAR.10 in the squadron lingered in service with A Flight at RAF Chivenor until November 1981. A number





Wessex HC.2 XT605/E of No.28 Squadron in the late 1980s with the white identification bands particular to Hong-Kong-based Wessex machines. (Adrian Balch)

of Wessex HC.2s had been modified to HAR.2 standard for SAR duties specifically for service with No. 22 Squadron. With an unrefuelled range of 298 miles (185 km) the Wessex HAR.2 needed to effect intermediate stops during long-distance call-outs. Although SAR helicopters were permanently detached at Flight strength to various airfields around the British coast to be within easy reach when required, the RAF located fuel dumps in remote areas of the country where airfields are not always available and where helicopters could land to refuel when on long range missions. For the same reason oil rig helipads are often still used during rescues far out at sea. Wessex HAR.2s were crewed by a pilot, navigator/winch operator and NCO winchman, the latter on most occasions having to be lowered down with the winch cable to effect the rescue operation.

The crew of an RAF SAR helicopter had to work as a team during a rescue operation. The helicopter hovered directly over the casualty but since the pilot could not see directly below him he relied on the navigator to talk him into position. The winchman was then lowered to the casualty by the Wessex's 300 ft (91.5 m) winch cable and strapped the casualty either to a strop or to a lightweight stretcher called the Neil Robertson stretcher. Both winchman and casualty were then hoisted up into the machine. In the case of downed military aircrew, these were secured by a Grabbit hook which is a simple snap-lock mechanism on the military lifejacket which is hooked onto the winch cable.

The improvement in performance and capacity of the Wessex HC.2 even over the turbine-powered Whirlwind HAR.10 was clearly felt, the Wessex's twin engines giving a certain reassurance to both the rescuers as well as the casualties particularly when operating far out at sea in bad weather, as was so often the case given the nature of the task. The Wessex could in fact maintain hovering height on one engine, which gives greater safety in difficult conditions, and could carry more people in one sortie than the Whirlwind. Although the original role of the RAF's SAR units was to rescue aircrew, it was (and still is) civilians in trouble that benefit most of the service. No. 22's crews and yellow-painted aircraft earned a reputation for themselves to the point of heroism, often flying sorties beyond the call of duty to rescue people over sea and land, circumstances which resulted in the award of numerous commendations, awards and bravery medals to the crews and justifiably putting the RAF in excellent light with the general public. No. 22 maintained up to four independent flights at airfields around Britain's coast, the detachments being moved from time to time according to exigencies and to fit with other rescue squadrons of both the RAF and the Royal Navy.

Later in 1976 No. 22 moved to RAF Finningley in Yorkshire to form, with No. 202 Squadron, the RAF Search And Rescue Wing, which also housed a Headquarters to support the various flights that comprised both squadrons. By 1983 No. 22 Squadron held six flights with Wessex HAR.2s, deployed as follows: A at Chivenor, B at Leuchars, C at Valley, D at Leconfield, E at Manston and F at Coltishall. By 1987 the

Manston Flight had been disbanded, as was the Leconfield D Flight in 1990, and the Coltishall Flight became E Flight. In October 1992 British Ministry of Defence plans revealed a downsizing of the RAF's SAR network to eliminate overlaps in coverage by a redeployment of assets which would also better reflect the reduced military threat and the reality of civilian rescue missions which accounted for some 90 per cent of all call-outs during that period. In December the Headquarters was moved from Finningley to RAF St. Mawgan, in Cornwall, together with the engineering Squadron that supported both Wessex and Sea King helicopters. The number of SAR Flights (of 22, 78 and 202 Squadrons) was to be reduced from nine to six and the Sea King would eventually replace the Wessex, but not one for one. The Sea King was obviously a more modern aircraft compared to the ageing Wessex, particularly for its two pilots, more power, three times the range, better autohover in all weather conditions, and superior navigational equipment that included radar, but the Wessex was very often called-out for rescue operations in mountainous regions or in fairly tight confined areas on account of its smaller size. During 1993, by which time the Sea King HAR.3 had entered service, Wessex HAR.2s of No. 22 Squadron maintained A Flight at Chivenor, C Flight at Valley and E Flight at Coltishall, each operating two aircraft and four crews together with the five Wessex aircraft of the SAR Training Unit (SARTU) at RAF Valley. The other Wessex flights had been disbanded and their area was taken care of by Sea Kings of No.78 and 202 Squadrons.

On 1 July 1994, A Flight of No. 22

Wessex HU.5 XS509 in the scheme of the Empire Test Pilot School, Farnborough before the school moved to Boscombe Down

Squadron moved to Chivenor and received two Sea King HAR.3 helicopters to replace its Wessex HAR.2, while three weeks later B Flight moved to a new SAR base at RAF Wattisham and it, too, received Sea Kings. The Coltishall flight disbanded too, so that by 1996 only C Flight at Valley remained with Wessex aircraft. In mid-1996 the Flight relinquished its last examples in favour of Sea King HAR.3A, enabling the whole squadron to make a complete transition to the new aircraft and ending the Wessex's role of operational SAR in the RAF.

Search and Rescue Training Unit (SARTU)

Closely linked with No. 22 (and with Whirlwind and Sea King-equipped No. 202 Squadron), with which it also shared RAF Valley, the Search and Rescue Training Unit (SARTU) was formed in 1979 with five Wessex HAR.2s entrusted with the training of RAF helicopter crews in the whole spectrum of SAR operations. The SARTU course practically represented part of the final phase of the Rotary Wing Course offered by No. 2 FTS at RAF Shawbury since helicopters have always had a secondary rescue function, whatever their primary role. The SARTU Wessex course therefore laid emphasis on both pilots and rear crewmen who had to keep close liaison during actual rescue missions, the latter having to double as navigator as well as winch operator. Prospective pilots

Wessex HC.2 XL728, of the Royal Aircraft Establishment, Farnborough in 1971. It had light aircraft grey fuselage sides and a blue lightning stripe. (Adrian Balch)



had to be rated as above-average to be accepted for SARTU training, which consists also of learning how to rescue survivors from cliffs, the sea and from RAF rescue launches. Successful pilots were then posted to either No. 22 or 202 Squadron. SARTU became part of the DHFS on 1 April 1997, having on that date relinquished all its Wessex aircraft in favour of the Griffin HT.1.

No. 60 Squadron, the Wessex training unit

Diverted from a fighter squadron to a communications unit, No. 60 Squadron received fixed wing light transport types in RAF Germany from 1969 and, from May 1992, was re-equipped with Wessex HC.2s at RAF Benson in Britain, which became its home base after some 70 years based overseas. The unit's primary task was Army support, but it also carried the responsibility of Operational Conversion training of RAF Wessex crews in the sup-

port role. For this purpose No. 72 Squadron provided nine Wessex aircraft (the latter unit still remained with 15 aircraft!) and a small number of experienced crews and with these assets No. 60 established the Wessex Operational Conversion Flight (WOCF) as well as an operational element. Two aircraft and ten instructors, five of whom pilots, became available to the WOCF, which provided an eight-week course to bring to operational level those pilots arriving from basic training at RAF Shawbury who would have already had some Wessex experience. Having completed their training, crews joined No. 72 Squadron in Northern Ireland, No. 28 in Hong Kong or No. 84 in Cyprus. In the meantime the other half of No. 60 began operational missions at the end of 1992 in the form of exercises with the Army both in the UK and in Germany in conjunction with other Puma and Chinook squadrons. No.60 Squadron disbanded at Benson on 1 April 1997.

The Wessex HC.2s of the Royal Air





Force became synonymous with rescue, whether on land or on sea, and appreciated by both the civil population as well as by members of the armed forces. That it carried out this role with distinction is as much a tribute to the crews that flew them as much as to the sturdy airframe and engine reliability of the Wessex. The latter attributes were more apparent in the troop carrying and assault role where its ruggedness came into play. Operations in difficult areas necessitated the adoption of an all-purpose chin air filter which gave the machine a mean appearance, not really undesirable in this assigned role. Like the Royal Navy's Commando Wessex, the HC.2 was utilised with success as a troop lifting helicopter, carrying British Army troops to inaccessible areas, a role which, if less in the spotlight, was nevertheless an important contribution to the development of the helicopter as an assault machine.

WESSEX HCC.4 The Queen's Flight and No. 32 (The Royal) Squadron

After production of the HC.2 had ceased in 1965, the last example having been delivered to the RAF during July of that year, in 1968 Westland received an order for two Wessex finished as appropriate for the Queen's Flight to replace the Whirlwind

Wessex HU.5 XS498-T, No.848 NAS

HCC.12. An HC.2 was made available to the Flight at RAF Benson for crew training in December 1968. In the meantime two new Wessex aircraft, XV732 and XV733, were completed to HC.2 standard with extra navigational equipment and having their main cabin finished to a VVIP level. In addition these had a folding step under the cabin door and wider windows similar to Royal Navy examples, and were designated Wessex HCC.4. XV732 made its first flight on 17 March 1969, followed by XV733 on 13 May, the former entering service on 25 June in time for the investiture of Prince Charles as the Prince of Wales at Caernarvon Castle six days later, while XV733 was delivered on 30 June.

Wessex HU.5 XT470/S-G of No.847 NAS, HMS Bulwark, lifts a damaged Sioux helicopter of the Royal Marines

Being entrusted to transport royalty, the two aircraft had a special maintenance routine, including more frequent inspections and servicing and more frequent replacement of parts. Painted in Queen's Flight official colours of Post Office Red with Royal Blue cheatline, the two Wessex HCC.4s served the Royal Family faithfully for several years, being kept busy all year round and not limiting themselves to flights within the UK. By 1983 the two aircraft had completed 10,000 hours, while the following year was registered as the busiest of all, the two Wessex alone completing 858 flight hours. During the first half of the 1990s public scrutiny of royal expenditure showed that the expense of retaining a flight (which included fixed wing types as well) was considered to have become unsustainable at a time of defence cutbacks. Radical changes were proposed and on 1 April 1995 the Queen's Flight was merged into No. 32 Squadron based at RAF Northolt, as a result of which the unit was honoured with the title of 'The Royal Squadron'. Although officially the term Queen's Flight ceased to exist, royal transport continued to be referred to inaccurately both by the public and in the press as the Royal Flight or the Queen's Flight.

When the Wessex HCC.4s were retired in 1998, No. 32 (The Royal) Squadron discontinued to provide helicopter service to the Royal Family. A long term contract was entered into between the Royal Household and private operators to provide a single Sikorsky S-76C and crew for transporting royalty as from 1 April 1998 outside the orbit of No. 32 which continued, however, to operate fixed-wing royal transportation. Wessex HCC.4s XV732 and XV733 had been in service for 29 years with the Royal Family, and had carried out nearly 10,000 flights between them, and each flying the equivalent of 20 times around the world.

THE ROYAL NAVY UPDATES THE WESSEX WESSEX HAS.3

When the Wessex HAS.1 first entered service it had introduced several new systems into the RN which turned the machine into an effective anti-submarine weapon. However, the type had its share of teething





Wessex HU.5 XS483/A-E of No. 848 NAS, HMS Albion, in the jungles of Borneo during the confrontation with Indonesia.

troubles which were never really solved and eventually developed into recurring problems, such as disintegrating engines and fires caused by the AVPIN starter mechanism. In addition, systems which had been as yet largely unproven at operational level started to reveal defects, the most serious of which was the Flight Control System which proved less reliable than at first thought to be. Furthermore, the introduction into service of modern and faster submarines with more efficient defensive countermeasures demanded improved detection systems for the attacking aircraft, in the face of which the sortie duration of the Wessex HAS.1 and its effectiveness as a detector and attacker gradually proved to be lacking to the point of becoming impractical. The Navy was therefore expecting an enhanced Wessex which would not only address the new situation but also eliminated the HAS.1's shortcomings.

Fortunately both Plessey Marine Systems, manufacturers of dipping sonar equipment, and other British electronics firms had been improving on their products. Plessey and the Royal Navy's Underwater Weapons Establishment had long been developing a new and advanced dipping sonar, the Type 195, this having been already tested during flight development and evaluation programme of the Wessex. While the Wessex HAS.1 had entered service with the Type 194 Sonar, development continued with the more powerful and longer range Type 195. This advanced piece of classified equipment was

so secret that the Wessex (HAS.1 XM329) on which the first (and until then, the only) Type 195 sonar unit was tested was fitted with specially large pontoon floats to the undercarriage gear so that the helicopter would float and the equipment recoverable in case it had to ditch. These elongated floatation bags were rather large for the Wessex, so that the test aircraft was nicknamed 'Bootsie'.

In parallel Marconi was working on a new Doppler navigation system; another British company, Ekco, was developing a lightweight search radar, while Westland was improving the HAS.1's Flight Control System that had been designed by Louis Newmark. Among the enhancements introduced by Westland in the FCS was a duplex system in place of the original simplex, that is, the system had a failsafe back-up unit for use in case of a systems failure, while limited facility was given to the Observer to manually take over when necessary to modify the flight profile. The new fully-automatic FCS enabled the new version of the Wessex to perform a complete anti-submarine sortie from lift-off to landing, including transiting through various hover positions for sonar dipping purposes. This worked in conjunction with the Marconi navigation system and the Ekco search radar and for the first time also enabled the new Wessex to operate day and night and in all weather conditions without the need to rely on information transmitted by land or surface vessel radars. The opportunity was taken by Westland to install the more powerful 1,600 shp (1194 kW) Gazelle NGa.22 Mk 165 turboshaft engine and to replace the troublesome highly inflammable

AVPIN starters of the previous engine with a compressed air starting system.

The total improvement package of the new Wessex, designated HAS.3, gave the Royal Navy an all-British helicopter that was head and shoulders above its contemporaries in the Western world in terms of anti-submarine warfare technology and tactics. To further increase the effectiveness of the Wessex HAS.3, the aircraft was wired to carry an impressive range of anti-submarine weaponry, including four Nord SS.11 air-to-surface or AS.12 anti-shiping wire-guided missiles or two Mk 44 or 46 lightweight torpedoes plus depth charges, machine guns or rocket projectiles.

Inside, the equipment for the radar and the Type 195 sonar was so bulky that the Observer and Radar Operator had little space left where to manoeuvre inside the rear cabin. The Ekco search radar was installed externally within a thimble-shaped dorsal radome. This protruding radome was found to affect the airflow along the tail rotor, causing an airflow twitch, and a raised, streamlined fairing had to be added to the rear of the main gearbox and rotor head housing to eliminate this anomaly. Westland utilised the precious space inside the fairing to store an additional alternator and related equipment. The protuberant fairing and thimble gave the new Wessex a humped appearance, prompting its immediate nickname of 'the Camel'. The nose was provided by an 'upper lip' cover which included an airspeed indicator probe.

Three HAS.3s, XT255 to XT257, were manufactured by Westland to the new standard to serve as pre-production
WESTLAND WESSEX WARPPAINT PAGE 43



Wessex HU.5 XT453/K of No. 845 NAS, HMS *Hermes* flying over Malta's Grand Harbour on 19 April 1974. (G.Mangion)

machines while the various new components were being tested separately and in isolation in various HAS.1 airframes. XT255 first flew on 3 November 1964, and when the company testing was completed, the Admiralty ordered the conversion of forty-three HAS.1s to HAS.3s standard, using mainly airframes of Commando units that were converting to the Wessex HU.5.

The first five machines were delivered to No. 700H NAS, the Intensive Flying Trials Unit. This unit, disbanded in January 1962 when the Wessex HAS.1 trial period had been completed, re-commissioned at RNAS Culdrose on 9 January 1967 initially with HAS.1s but soon added the new HAS.3s to its complement. No. 700H disbanded the following 15 September 1967 but two other training squadrons received the type.

In October 1967 No. 737 NAS at RNAS Portland received seven HAS.3s in addition to its HAS.1 complement, and acted as the advanced and operational training squadron for Observers. This squadron eventually added another task when in June 1970 it took over from No. 829 NAS the parentage of the Wessex HAS.3 Flights in County-class destroyers, leaving 829 to cater for Wasp flights. That same year it partly re-equipped with Sea King HAS.1s. In May 1972 No. 737 took on responsibility for ASW Operational and Advanced Flying Training and type conversion for Wessex HAS.3 pilots, Observers and Sonar Operators, increasingly liaising with RFA *Engadine*. In 1975 the Sea Kings were withdrawn for use by operational units, allowing No. 737 to concentrate on Wessex ASW training. It escaped disbandment in 1982 owing to the outbreak of the Falklands War, where its HAS.3s on County-class destroyers took part, and where HMS *Antrim*'s two HAS.3s achieved fame. In August after the war the latter task reverted to No. 829 NAS and on 7 February 1983 No. 737 disbanded.

Helicopter Advanced Flying Training on the Wessex was still being carried out by No. 706 NAS when the HAS.3 became available. In July 1967 six examples of the

latter were delivered to 706's Culdrose base for advanced ASW training. The HAS.3s were withdrawn in November 1970 by which time the unit had re-equipped with Sea King HAS.1, the unit's earlier Wessex HAS.1s remaining on strength for a further two months.

In the meantime, operational squadrons of the Fleet Air Arm commenced releasing their HAS.1s to be replaced by HAS.3s. This version equipped four Fleet Air Arm units: No. 814, 820 and 826 at Culdrose, and No. 819 at Ballykelly. In the meantime, County-class destroyers exchanged their older helicopters for the new type as they docked at Portland.

No. 814 NAS was first to convert in August 1967 at RNAS Culdrose, where the squadron re-grouped around a nucleus of the disbanded No. 700H NAS with six aircraft. The first operational tours were made by detaching flights on RFA vessels, but in May 1968 the whole squadron embarked on HMS *Hermes* which sailed to the Far East and Australia. Returning home round the Cape in March 1969, No. 814 remained on *Hermes* but detached flights to RFA vessels including *Engadine*, *Olwen* and *Regent*, while in February/March 1970 a flight of four aircraft detached to RAF Luqa, in Malta, for a fortnight. Returning

home on *Hermes*, the unit disbanded at Culdrose in July of that year.

Based at RNAS Ballykelly, and detaching flights to RFA vessels, No. 819 returned its Wessex HAS.1s for re-equipping with the HAS.3 version in April 1968. The unit's task continued with supplying aircraft to RFA ships, a task which occupied the whole of its HAS.3 period until its disbandment at Ballykelly in January 1971. The vessels served by No. 819's HAS.3s included RFA *Engadine*, *Tidepool*, *Olmeda*, *Olma* and the then new *Grey Rover*.

No. 826 NAS received six Wessex HAS.3s at Culdrose in October 1968, retaining two HAS.1s to equip an SAR flight. It embarked on HMS *Eagle* that same month for a summer visit to the United States east coast, which was followed by a Mediterranean tour during October/November 1969. Shortly after its return home at Culdrose, No. 826 disbanded in March 1970.

During May 1969 No. 820 phased out its Wessex HAS.1s in favour of HAS.3s, four of which were delivered to the unit at Culdrose. These joined HMS *Blake* which, like HMS *Tiger*, was a cruiser converted to an assault ship by replacing the aft gun turret with a 4-aircraft hangar and a helicopter landing platform. No. 820 sailed to the Far East and Australia on *Blake* in February 1970, where two HAS.3s were detached to RFA *Olmeda*. Back home at end-1970, the unit provided flights to various RFA vessels including *Tidespring*, *Engadine* and again *Olmeda* before embarking again on *Blake* in July 1971 for a visit to the United States and the Caribbean, and then to the Mediterranean and back again to Culdrose. From then till December 1972, when Sea King HAS.1s replaced the Wessex HAS.3s, No. 820 alternated between Culdrose and *Blake*.

No. 829 NAS based at RNAS Portland still had the parentage of Wessex helicopters detached to County-class destroyers when in June 1969 its HAS.1s started to be replaced with HAS.3s. In June 1970 responsibility for these flights was passed



Wessex HU.5 V-R from HMS *Fearless* assists blazing Greek ship *Nostros Vasso Athens* three miles off Malta in November 1976

to No. 737 NAS, and it was not before August 1982 that this task reverted to No. 829, which it held until January 1984 when it relinquished all its Wessex aircraft.

From the systems point of view, the Wessex HAS.3 was a frontrunner when it first entered service and served the Royal Navy loyally if inconspicuously in the important anti-submarine role for a short number of years until it was overtaken by the advance of technology. In sortie endurance, however, the four-crew HAS.3 proved to be rather a failure, having an operating range shorter than the Whirlwind HAS.7. The British Admiralty was not satisfied with the state of affairs in British anti-submarine warfare capability, where new scenarios often necessitated sending a helicopter 100 miles (161 km) from the parent ship, loiter for one hour, and return back. The HAS.3's higher weight at 14,000 lb (6356 kg) fully loaded with fuel and the full array of anti-submarine weapons and equipment made operational sorties only just viable. In certain situations Wessex HAS.3s had to operate in tandem with Wasp HAS.1s where the former, free of weapons and thus light enough to be able to loiter longer, hunted and found the submarine, and the Wasp delivered the punch, thus defeating the concept of having the 'hunter and killer' in one airframe. This lack of operational endurance prompted the Royal Navy to further develop the Helicopter In-Flight Refuelling (HIFR) technique already started by the HAS.1, particularly by XM837 with equipment produced by Flight Refuelling Ltd. This entailed the helicopter to hover

close to the nearest friendly vessel, not necessarily suited for landing operations, to refuel vertically and thus greatly extending the time on station by eliminating the need for the aircraft to return to its mother ship. The method was perfected by the HAS.3 and its use somewhat alleviated, though it did not eliminate, the sortie endurance problem. This method, pioneered operationally by the Wessex HAS.3, is still in use today by current helicopters but HIFR has come to mean Hover In-Flight Refuelling to differentiate it from the probe and hose method of in-flight refuelling from another tanking aircraft or helicopter at height and at high speed.

The HAS.3 version of the Wessex may therefore be said, with hindsight, to have been regarded as a stop-gap measure, since when the first HAS.3 entered service in August 1967 the Admiralty already had in mind a successor large enough to feasibly carry the same payload of weapons and ASW electronics over a more respectable operational radius of action. In this regard it is significant that (a) such an aircraft had been flying operationally with the US Navy as the SH-3A Sea King since 1961; (b) as early as 1963 Westland had held a licence to build in Britain the Sikorsky S-61 series, a general designation that later included the Sea King; (c) by 1967 Westland had acquired a licence from Sikorsky to specifically build the Sea King with British engines and equipment; and (d) the British Admiralty was aware that the larger size of the Sea King would still enable it to operate from existing RN carriers and commando ships as well as from the specialised helicopter cruisers HMS *Blake* and *Tiger*. All this explains the comparatively short period

of the HAS.3's retention in service, being gradually replaced by Westland's HAS.1 version of the Sea King as from January 1970. Within its limited radius of action, the Wessex HAS.3 eventually proved its worth well enough for the duration of its short career, and more especially in tough combat conditions. Apart from machines stationed on County-class destroyers, Wessex HAS.3s ended their frontline service on 29 January 1971 when No. 819 NAS disbanded. The Wessex HAS.3 era, if anything, served not only to pioneer and commission into service sophisticated ASW equipment (including the proven Ekco radar/ Type 195 sonar combination which was later to be carried by the first version of the Sea King), but also to proficiently train a cadre of naval officers in modern sonar and radar equipment and techniques who were found useful when these had to crew the next generation ASW helicopter of the Fleet Air Arm.

MORE NAVY UPDATES WESSEX HU.5

With the Wessex Commando Mk 1 the Royal Navy had achieved its target of operating a helicopter in the assault role with significant improvement over the Whirlwind. HMS *Bulwark* and *Albion* had proved the assault carrier's worth in landing Royal Marines by helicopter in trouble spots, but age was creeping in on these vessels. HMS *Albion* was retired in 1972 but work was already at hand to provide a replacement when HMS *Hermes*, a fleet carrier, was docked for conversion into a Commando helicopter assault ship in 1971. Her fixed-wing aircraft facilities were

Wessex HU.5 wearing black distemper paint on the undersurfaces during NATO Exercise Strong Express in Norway with Royal Marines of the 45 Commando





HMS Albion with 845 NAS Wessex HU.5s embarking commandos on board for NATO Exercise Lovesong

development was the wiring to enable the HU.5 to also carry two Mk 44 or 46 light-weight torpedoes. Like other marks of the Wessex, a trainable 7.62 mm GPMG could be fired from the starboard entrance door or window. During operations it was not rare for two such machine guns to be fitted also in each rear window. A chin all purpose nose air filter similar to the one fitted to the RAF's HC.2 became standard. Free from the heavy sonar and navigation equipment carried by the anti-submarine Wessex HAS.3, the HU.5 had an underslung lift capability of 4,600 lb (2088 kg) and became the Commando regiments' work-horse, carrying troops, supplies, ammunition and materiel to otherwise inaccessible areas, both during exercises as well as in war zones. It was frequent practice to employ the HU.5s to carry Pack Howitzers, Wombat anti-tank guns and light army vehicles as underslung freight, besides the usual crated supplies in netting, where its superior twin-engine muscle was put to good use. The main external difference from the RAF's HC.2 was the adoption of the rectangular main cabin windows of the HAS.1 and HAS.3.

Westland received the first order for forty HU.5s in August 1962, that is, before XS241 had flown, with XS479, the first aircraft off the production line, first flying on 17 November 1963. The whole batch consisted of XS479 – XS500 and XS506 – XS523 and was delivered between December 1963 and March 1965. The Intensive Flying Trials Unit (IFTU) formed on 29 October 1963 at RNAS Culdrose under No. 700V NAS's numberplate, received the first of six examples the following month. Its role was to introduce the new type into navy service by training crews to cope with the drastically enhanced performance delivered by the twin turbines of the HU.5 as well as the helicopter's armaments and lift capability in the assault role. While No. 700V (IFTU) was redesignated No. 848 NAS in May 1964, the CAFTU as already mentioned had been formed in October 1964 under No. 707 NAS's number plate to provide advanced instruction to RN and RM Commando pilots, training on communication work, development flying, weapons trials as well as training crews for operations from Royal Fleet Auxiliary vessels. In 1972 No. 707 moved to RNAS Yeovilton where it also assumed an SAR commitment, while between July and December 1974 it formed the two-aircraft Red Dragon Flight whilst HRH Prince Charles, the Prince of Wales, was undergoing type conversion to the Wessex HU.5. In April 1982 No. 707 provided most of the HU.5s to form the nucleus of No. 848 NAS for service in the Falklands War. The squadron continued in its Wessex Commando training role but it started to re-equip with Sea King HC.4s in 1983 so that when all its Wessex aircraft were shed in 1985 it transferred Wessex Commando training to No. 771.

In the meantime, in May 1964, Whirlwind HAS.7-equipped No. 848 NAS

removed and the deck strengthened for eventual embarkation also of Harrier V/STOL fighters. She was recommissioned as a Commando carrier in 1973, but this role was short-lived as she was converted to an ASW carrier in 1976, and later as a V/STOL carrier with a forward ramp. By then British defence policy was to retire the large fleet carriers and the idea of a smaller multi-role carrier that could carry both helicopters as well as Sea Harrier V/STOL fighter/strike fighters had carried the day, bringing to an end the need for the pure assault helicopter carrier.

This was still in the future. During operations in the early 1960s, the Wessex Commando Mk 1's single engine had proved to be a drawback not only in terms of carrying and lifting power, but also as unsafe in certain situations especially since the Commando helicopter was often required to operate in a hostile environment. By 1963 the RAF had already had its own twin-Gnome-engined HC.2s, and the RN was impressed with the additional load-carrying capacity and single-engine safeguard of the twin-Gnome Wessex, and became interested in adopting a similar version for the assault role to replace its

Commando Mk 1s.

Westland therefore had no difficulty in adapting the HC.2 design to satisfy the naval requirement. Initially it was considered that an HAS.1 could be easily converted into the new naval version, now designated HU.5, and that therefore no prototype would be required in view of the similarity with the HC.2. However, when it was later decided to build one, and XS241 was flown on 31 May 1963 as the HU.5 prototype to the RN's requirements, it showed that internally this version was quite different from the RAF's HC.2.

Powered by the same combination of two coupled Bristol Siddeley Gnome Mk 110/111 geared to an HC.2 transmission system, XS241 had its structure strengthened to cope with the rigours of its Commando role and the higher weight it would be required to lift. Like the Commando Mk 1, the Wessex HU.5 had various offensive weapons at its disposal, all carried on platforms fixed to the undercarriage legs: 2.75-inch rockets pods, a 7.62 mm FFG and SS.11 wire guided anti-tank missiles, which in the HU.5's case could be interchanged with the potent AS.12 anti-shiping missile. A further

became the first operational HU.5 Commando squadron, followed by No. 845 in January 1966, No. 846 in July 1968 and No. 847 in March 1969.

On 7 May 1964 No. 700V NAS (IFTU) was redesignated No. 848 Naval Air Squadron at RNAS Culdrose as a Commando helicopter squadron with 18 Wessex HU.5s and in January 1965 joined HMS *Albion*, sailing to Aden in March for hot climate trials in the Radfan and in Khormaksar. In June *Albion* and No. 848 proceeded east to Singapore where the unit became landbased and operated as five different flights from jungle clearings. Re-united in August 1966, No. 848 sailed home in *Albion* where it remained in Home waters, alternating between Culdrose and *Albion* until it sailed once more to the Far East again on *Albion* where it stayed for the period January 1968 to June 1969. The previous March eight of its HU.5s had been hived off to form No. 847 NAS at Sembawang naval base, Singapore. No. 848 was not long in re-embarking for two further spells in the Far East, first sailing on *Bulwark*, spending there eight months from January to August 1970, and then on *Albion* from March to December 1971. During the latter tour it departed from Culdrose with 12 Wessex HU.5 but increased this to 22 aircraft in May 1971 when it took over 10 machines from the disbanded No. 847 NAS. Also during the course of the same tour A and D Flights were detached on board HMS *Intrepid*, one of the RN's two purpose-built assault ships.

During 1972 No. 848 carried out a short tour in the Mediterranean on HMS *Albion* and on its return to Culdrose detached B Flight to HMS *Fearless*, the RN's other new assault ship, and C Flight to *Intrepid* with A and D Flights embarking on *Bulwark*. Back in the Mediterranean on *Bulwark* with the whole squadron in 1973, during May the squadron detached A and D Flights to Nicosia, Cyprus, and B and C Flights to RAF Luqa, Malta. Alternating between *Bulwark* and RNAS Yeovilton, its new land base from late 1972, 848 started a Caribbean tour in January 1976, at the end of which it disbanded on 31 March of that year. It was the Falklands War which caused the re-commissioning of No. 848 at Yeovilton on 17 April 1982, again with Wessex HU.5s provided by No. 707 NAS. This time the squadron was composed of four flights, A to D, which sailed to the South Atlantic on RFA *Olna*, *Olwen* and *Regent* and SS *Atlantic Conveyor*. The complement of aircraft of D Flight on *Atlantic Conveyor* was lost when the vessel was sunk on 25 May, while the rest returned to the UK in September and October after a lively period of operations, the whole squadron disbanding on 30 November 1982.

Sixty HU.5s that comprised the second order by the RN, and consisting of XT448 – XT487 and XT755 to XT774, were delivered between 17 February 1965 and 19 September 1967. With the arrival of the first examples from this order, further

first line as well as training naval squadrons could re-equip.

In January 1966 No. 845 NAS traded in its Commando Mk 1s for 16 new HU.5s at Culdrose, a type which the unit would be using continuously for the following two decades. It embarked on HMS *Bulwark* and in August 1966 sailed to the Far East where it stayed until April 1968. Still on *Bulwark* in 1969, 845 took part in an exercise in northern Norway, which later became a regular event, and in the Mediterranean, until it transferred to HMS *Albion* in May 1970 with 14 HU.5s until April 1971. It then embarked on *Bulwark* once more, alternating between the Mediterranean and Home waters during 1971, and in January 1972 a flight alighted at RAF Hal Far, Malta, to assist in the temporary withdrawal of British forces from the island. Further embarkations followed, including a return to *Albion* in September 1972 for a Canada trip, and on HMS *Hermes* in March 1974 during which 845 participated in the evacuation of British families to safe areas in Cyprus during the Turkish invasion of the island in July. The unit was again on *Hermes* in March 1975 where Canada, Norway and the Mediterranean were revisited in the course of 1975 to 1976, by which time aircraft complement was reduced to eight aircraft dispersed among various bases, aircraft carriers and other vessels. When sister squadron No. 846 NAS ceased to exist as an active unit in September 1977, No. 845 absorbed its HU.5s during which period No. 845 was mainly shore based at RNAS Yeovilton, which had become its new home base in 1972. Detachments to various locations and ships were made in the period 1974-1976, vessels including HMS *Fearless*, *Invincible* and *Hermes*, and RFA *Sir Geraint* and *Olmeda*.

A permanent detachment to Northern Ireland from October 1977 was only terminated following a call to the south Atlantic in May 1982 for the Falklands War. For the

duration of the conflict No. 845 was embarked at various stages on no less than 14 different vessels, after which a period ashore followed. While most of the squadron returned home in July 1982 on board MV *Atlantic Causeway*, D Flight remained on Ascension Island until July 1984. In September 1982 the squadron was back in the Falklands to absorb the assets of No. 847 NAS, returning home on HMS *Illustrious* in October. When No. 845 re-equipped with Sea King HC.4s in June 1984 it still retained Wessex HU.5s until October 1986, during which period its main role was Royal Marines support in NATO's northern flank, deploying detachments to Norway each winter and ashore in Europe and the UK and abroad during the rest of the year, including deployment on various RN and RFA vessels.

No. 846 NAS was already a Commando helicopter squadron in 1962 with Whirlwind HAS.7 with which it had seen action in Borneo. When it re-equipped with Wessex HU.5s on 29 July 1968 at Culdrose, it carried with it this experience, even if from there onwards its career was interrupted by a number of decommissioned periods. From Culdrose No. 846 embarked its four aircraft on HMS *Fearless* and from February 1969 on RFA *Engadine* for cold weather trials which were repeated in the winters of 1970 and 1971. Like No. 845, it was on HMS *Bulwark* in Malta with four Wessex HU.5s to assist in the temporary withdrawal of British forces from the island. Moving base to Yeovilton the following May No. 846 became the Wessex HU.5 headquarters and trials unit, relieving No. 707 NAS (CAFTU) from much extraneous administrative and trials work. No. 846 embarked for a spell on HMS *Albion* in 1972 and before disbanding on 17 December 1975 it took over the parentage of three Wessex HU.5s provided to RFA *Regent*, *Resource* and *Tidespring*. No. 846 reformed four months later, on 1 April 1976 at Yeovilton as a Commando squadron



Wessex HU.5 in full battle attire with gun platform, missiles and wheel covers



Wessex HU.5 embarking Royal Marines - typical scene of the Wessex Commando

from the assets of the disbanded No. 848 NAS, including eight Wessex HU.5s. Detachments to Norway and the Mediterranean followed, as well as on RFA *Sir Galahad* and *Sir Tristram*, until the whole squadron joined HMS *Hermes* in June 1977. The following September the squadron ceased to exist as an active unit when it was pooled with No. 845 NAS at Yeovilton, only to be re-activated on 4 October 1978, again with Wessex HU.5s, twelve of which formed its complement. It alternated between embarkations on *Hermes* and *Bulwark*, and from December 1979 it started to re-equip with Sea King HC.4s, disposing of the last Wessex HU.5 in October 1981.

Last of the four HU.5 Commando squadrons, No. 847 NAS re-equipped with the type at Sembawang, Singapore, on 14 March 1969 with eight HU.5s from No. 848 NAS. Exercises in the Far East by detachments on HMS *Albion* and *Fearless* and RFA *Sir Galahad* followed, while during 1970 it alternated embarkations on HMS *Bulwark* and *Intrepid* and various RFA support vessels. For a spell in November 1970 No. 847 was also aboard the repair and troop transport carrier HMS *Triumph*, with which it took part in flood relief work in East Pakistan (now Bangladesh) and in the following January in a similar operation in West Malaysia. Disbanded on 22 May 1971 at Sembawang, the Argentine invasion of the Falkland Islands necessitated that No. 847 be reformed again, which it did at Culdrose on 7 May 1982 from No. 771 and 772 NAS with 21 Wessex HU.5s. These arrived in the South Atlantic islands on board SS *Atlantic Causeway* and RFA *Engadine* and disembarked at Port Stanley, where the squadron eventually disbanded once more in September 1982 after the end of hostilities.

No. 772 NAS had been flying Wessex HAS.1s from Portland since 1974 and in 1976 it supplanted these with Wessex HU.5s. From 9 September 1977 No. 772 grouped under its responsibility the ships'

flights of RFA *Regent*, *Resource* and *Tidepool* which were hitherto served by various squadrons. In 1982 a number of the unit's aircraft were hived off to form No. 848 NAS for service in the Falklands War, and in March 1988 it shed its Wessex HU.5s in favour of Sea King HC.4s.

The last of the Royal Navy's HAS.1s saw service with No. 771, which replaced them with HU.5s at RNAS Culdrose in July 1979. The unit provided SAR cover for the Culdrose area, and in 1983 it absorbed the Culdrose Station Flight, at the time becoming the only British naval squadron to operate both rotary and fixed wing types. In 1985 it inherited the Wessex Commando training role from No. 707 NAS when the latter re-equipped with Sea Kings. No. 771 itself started to receive Sea King HAR.5 in 1987, shedding its last Wessex HU.5s in March 1988, having also been the last to fly the HU.5 version. No. 771's Wessex HU.5s were distinctive as they carried an 'ace of spades card' logo on their rotor head housing, which is not the unit's official insignia.

The Wessex HU.5 was also deployed specifically on two particular RFA ships. In October 1966 No. 829 NAS, which already held the parentage of the Small Ships' Flights with Wessex HAS.3s, received two Wessex HU.5s for operation from the RFA support vessels *Regent* and *Resource*, a

responsibility which the squadron carried out until October 1976. *Regent* and *Resource* were particular in that, at the time, they were the only RFA vessels to have their Wessex aircraft carry ship code letters, RG and RS respectively.

The Royal Navy, too, had its own Wessex VIP flight. Communications unit No. 781 NAS based at Lee-on-Solent had fixed wing aircraft as its equipment owing to the nature of its main role, but for its secondary task of SAR it received its first helicopters in 1959 in the form of Whirlwind HAR.1s in replacement of its old Sea Otters. In June 1969 it replaced various marks of Whirlwinds with Wessex HU.5s, which it used both for SAR and VIP duties. Two of the HU.5s were used for VIP work and were recognisable by their special paint scheme of green and white, for which they were colloquially known as 'Green Parrots', but more officially as the Admiral's Barges. However, No. 781's HU.5s engaged on SAR carried the more familiar naval rescue scheme of Blue Grey with dayglo red nose and fuselage band. The unit disbanded on 31 March 1981, having retained the SAR and VIP Wessex HU.5s till the end.

Built specifically for the assault role, the Wessex HU.5 – and indeed its predecessor the Wessex Commando Mk 1 – was a rugged machine and it proved its worth in the jungles of Borneo where the three naval squadrons involved spent three and a half years giving support to the British land forces there. The Wessex was loved by both Royal Marines and British Army soldiers and commanders and served not only to develop helicopter-flown assault tactics in an unfriendly jungle environment but also to train a large number of crews which were later to fly the heavier Westland Sea King HC.4 Commando. That the HU.5 was used also by other sectors of the Royal Navy for tasks as various as SAR and VIP communications goes to further prove the versatility of the Wessex in general and the HU.5 in particular.

OTHER OPERATORS OF THE WESSEX IN THE UK

Besides the RAF and RN, the Wessex was



Wessex HAS.31, WA200, first example for the Royal Australian Navy



Wessex HAS.3 from HMS Antrim: AN-406 parented by No.737 NAS. Antrim's Wessex HAS.3s achieved fame during the Falklands War. It is seen landing on the outskirts of Stanley a few weeks after the cease fire. (A.W.Hall)

used by Britain's experimental and trial establishments, namely the RAE at Farnborough and Bedford, and the A&AEE at Boscombe Down. Various models were used, even before the type entered service with the RAF and RN, to test pre-service aircraft, equipment and weaponry, but Bedford's Wessex aircraft are best remembered for their contribution to the development of the 'glass cockpit', which was to be used in later helicopters particularly the Merlin. Farnborough's Raspberry Ripple-coloured machines, which were retired in January 1988 after 30 years of service with the Establishment, were perhaps the most colourful Wessex examples of all.

Westland retained eight aircraft for development purposes: two pre-production Wessex HAS.1s built in 1958 and powered by 1,450 hp Napier Gazelle 13 turbine engines; three HAS.3 prototypes at the start of the conversion programme from the HAS.1 from 1963; one re-engined HAS.1 as the basis of the RAF new build HC.2 programme from 1961; and two HU.5s, one a hybrid and one a true HU.5 prototype for the new build HU.5 programme from 1963.

WESSEX EXPORTS

While the S-58 Sikorsky managed to be exported to several countries in four continents, even because of favourable United States MAP and MDAP arms export terms, only 43 of the superior Wessex found their way to the export market. Of these, 27 went to the navy of Australia, the only country to effect a notable Wessex order.

Royal Australian Navy

It was in June 1961 that Westland received

an order for 27 examples of the Wessex HAS.1 from the Royal Australian Navy primarily for duty on the aircraft carrier HMAS *Melbourne*. By then the RAN had arrived at the conviction, albeit short-lived, that rotary-wing types could replace fixed-wing aircraft in many roles. The Australian Wessex machines were to be powered by the upgraded Napier Gazelle 13/2 Mk 162 flat-rated to 1,540 shp (1148 kW) in place of the lower-powered Mk 161, and this export version was designated Wessex HAS.31 by Westland. The first three, at a projected Yeovil production rate of three a month, were handed over at Nowra Naval Air Station, 109 miles (176 km) north of Sydney, on 26 November 1962. RAN Wessex HAS.31s were company-marked WA200 – WA226 on delivery, but later these received RAN serials N7- 200 to N7-226.

The first RAN unit to equip was No. 725 Squadron, a former fixed-wing aircraft fleet requirements unit which had been reformed as a rotary-wing squadron on 26 November 1962. No. 725 was a shore-based anti-submarine training unit and acted as a back-up to the carrier-based No. 817 Squadron. The latter was reformed with ten Wessex HAS.31s on 18 July 1963 at Nowra as the front line anti-submarine unit, just before the last Wessex consignment was delivered from Yeovil in September 1963. No. 817 embarked with eight Wessex HAS.31s on HMAS *Melbourne* in August 1963 in the fleet roles of ASW and SAR. It alternated between being shore-based at Nowra and aboard *Melbourne*, with a spell at Sembawang in 1965.

Even though the Australian Wessex had an engine which delivered more power than the Royal Navy's HAS.1, by 1968 the RAN considered the Wessex HAS.31 to be still underpowered to effectively carry out

both roles, and that year work was started to modify the airframes to accept the 1,600 shp (1194 kW) Gazelle 22 Mk 165 and take the opportunity to fit upgraded navigation and ASW equipment. By then the RAN had lost three Wessex aircraft in accidents: N7-206 in November 1962, N7-207 in September 1964 and N7-225 in March 1967. Twenty-three, that is all remaining HAS.31s except one (N7-217, this becoming an HAS.31A) were modified to HAS.31B standard. By March 1969 No. 817 Squadron was totally equipped with HAS.31Bs. The upgraded version differed externally mainly by having a fairing extension to the rotor head housing similar to the Royal Navy's HAS.3 and an under-side aerial.

In 1969 RAN changed its squadrons' designation to a US Navy style, so that No. 817 Squadron became HS 817 and No. 725 Squadron became HT 725.

As the operational unit equipped with the first ASW helicopter of the RAN, HS 817 demonstrated the versatility of the embarked helicopter, its Wessex aircraft taking part in varied exercises in Australia, Asia and in the Pacific. In addition, HS 817 also provided support for the troop carrier HMAS *Sydney* on voyages to transport men and equipment to Vietnam during Australia's involvement in that war. On 2 February 1976 HS 817 started to re-equip with Sea King Mk 50 in replacement of the Wessex. It was then that the RAN Wessex ended its ASW career.

At Nowra HT 725 disbanded on 27 December 1975 and four of its Wessex HAS.31Bs, stripped of their anti-submarine equipment, were transferred to HC 723 to provide SAR aircraft for HMAS *Melbourne*. In 1979 HC 723, which flew both fixed-wing as well as rotary-wing types, was additionally tasked with an Army Support role and had its Wessex



Wessex HAS.31B N7-200, coded 810.

complement increased to ten machines.

In early 1984 HC 723 shed its Wessex aircraft and these enabled the recommissioning of HC 816 at Nowra on 9 February of that year with Wessex HAS.31Bs, taking over 723's commitment in the Utility and Army Support role. However, HC 816's service life was rather short and disbanded on 30 June 1987. Five Wessex aircraft returned to HC 723 to provide fleet support, becoming the parent squadron for providing SAR helicopters to the RAN's frigates, the Wessex being carried on board HMAS *Stalwart* and *Success*. The Wessex was finally retired from HC 723's and RAN service on 31 December 1989.

Iraqi Air Force – Al-Quwwat al-Jawwiya al-Iraqiya

In 1963 the Iraqi Air Force placed an order with Westland for 12 Wessex HC.2s for troop transports powered by the Gnome Mk 110/111 arrangement. These were delivered with serials 588 to 599 between April 1964 and February 1965 and carried the export designation of Wessex Mk 52. In later years the helicopter fleet of the Iraqi Air Force became largely French- and Soviet-equipped and no further orders for British helicopters followed. It is known that in 1978 seven Wessex examples were still in the inventory, and four at the start of the 1991 *Desert Storm*.

Ghana Air Force

The Ghana Air Force placed an order in 1965 for two Wessex HC.2s basically similar to Iraq's Mk 52 but fitted for VIP and general transportation. They received the designation Mk 53 and serials G-630 and

G-631, both remaining in service until 1979. G-630 was sold as Wessex Mk 60 VH-BHI to Bristow Helicopters for a contract in Australia and, after a number of civil owners as G-BGER, subsequently finding its way in 1994 to the Uruguayan Navy as 065. G-631 was similarly disposed of to Bristow as G-BGWT in August 1979 and in January 1990 was sold in the USA as N250HL to Heavy Lift Helicopters. In 1991 it, too, found its way to the Uruguayan Navy, as 063.

Royal Brunei Air Force Angkatan Tentara Udara Diraja Brunei

In 1966 the Sultan of Brunei ordered two Wessex HC.2s for the country's fledgling air force, then known as the Royal Brunei Regiment Air Wing. These, designated Wessex Mk 54 and basically similar to the HC.2 and the other export equivalents, were delivered in January 1967 and wore serials AMDB-101 and AMDB 106. AMDB-101 replaced a Westland Whirlwind carrying the same serial and was disposed of as a Wessex Mk 60 in 1971. AMDB-106, too, was similarly disposed of in Bermuda in 1971 to be replaced by a Bell 212. It became G-BAWJ and subsequently VR-BEA, until in 1991 it finally found its way to the Uruguayan Navy.

Uruguayan Naval Air Service Aviacion Naval Uruguay and Uruguayan Air Force Forza Aerea Uruguay

The Uruguayan Navy and Air Force did not procure new-built Wessex aircraft but in the 1990s the Navy purchased three second-hand Mk 60s to replace ageing ex-US Navy SH-34J Seabats. The Wessex aircraft, two

ex-Ghana Air Force Mk 53s and one ex-Brunei Air Force Mk 54, which had been civilianised to Mk 60 standard by Bristow, their intermediate owners, were received as follows: 063 ex-Ghana G-631 delivered in August 1991, 064 ex-Brunei AMDB-106 delivered in August 1991, 065 ex-Ghana G-630 delivered in May 1994

These carried long-range tanks to increase their endurance and were based at Basa Aeronaval No. 2 'C/C Carlos Curbelo', in Laguna del Sauce on the southern tip of Uruguay.

In addition, from 1997, following the disbandment of RAF No. 2 FTS at Shawbury, No. 28 Squadron at Hong Kong and, from 2002, the disbandment of No. 72 Squadron at Aldergrove, both the Uruguayan Navy and Uruguayan Air Force managed to obtain a number of ex-RAF Wessex HC.2s, making Uruguay the second largest Wessex foreign operator after Australia. The known Uruguayan serials, ex-RAF serial and delivery dates are as follows:

Uruguayan Air Force:

070 ex-RAF XR515	Jun 97
071 ex-RAF XR522	Jun 97
072 ex-RAF XT605	Jun 97
073 ex-RAF XT675	Jun 97
074 ex-RAF XT673	Jun 97
075 ex-RAF XT678	Jun 97
076 ex-RAF XR497	Jun 02
077 ex-RAF XV723	Jun 02
078 ex-RAF XT668	Apl 03
079 ex-RAF XT676	Apl 03
080 ex-RAF XV721	Jun 02

Uruguayan Navy:

081 ex-RAF XR505	Jan 98
082 ex-RAF XR521	Jan 98

Wessex HC.2 080, Uruguay Air Force, ex-XT721 of No.2 Flying Training School

083 ex-RAF XS676

084 ex-RAF XS679

085 ex-RAF XT603

The Uruguayan Air Force machines were attached to Escuadrón Aéreo 5/BA I to supplement the unit's UH-1Hs. The Navy machines joined the first three at Basa Aeronaval No. 2 'C/C Carlos Curbelo'. It is reported that they are referred to as Sikorsky S-58s because Westland does not support these aircraft, probably due to distance, age and parts availability, and they are supported by Sikorsky. Also as a result, it is believed that few remain in an airworthy condition.

Bangladesh Air Force Bangladesh Biman Bahini

In 1973 Bangladesh, a new nation formed from the Eastern part of Pakistan after a civil war, obtained two ex-Royal Navy Wessex HU.5s for use by its air force. These were ex-XT452 and ex-XT478 and they seem to have been marked with their original construction numbers, namely WA274 and WA300. It is believed that the two survived various floods that hit the country over the years and that they were both withdrawn from use in 1994.

Sultan of Oman Air Force

Although Wessex HC.2s have appeared in Sultan of Oman Air Force marking, no exports to that country had been made. The explanation is that in 1974 the Omani government requested British assistance in constructing a defensive line, the Hornbean Line, near the Omani-Yemeni border during the Dhofari Campaign against rebels. On 6 April 1974 a detachment of four Wessex HC.2 of No. 72 Squadron from RAF Odiham arrived at RAF Salalah, in southern Oman. The detachment came under the direction of the SOAF so that the RAF roundels were superimposed by Omani roundels, though the aircraft retained their RAF serials. The Wessex assisted in airlifting construction materials as well as troops and artillery. They also provided artillery spotting, acting as forward air controllers. In November 1974, with the task completed, the detachment was withdrawn and the aircraft returned to Britain and reverted to their RAF markings. The aircraft involved were XR511, XT675, XR525 and XS678.

CIVILIAN WESSEX Mk.60

Although the Wessex is better known for its military service life, the name of Bristow Helicopters is a household name in Britain and was the largest civilian operator of the Wessex, both at home and abroad in gas and petroleum exploration projects.

It was in 1964 that the company, still part of Airwork International, wanted to replace its Westland Whirlwind helicopter fleet. Westland was approached with a view to modify the Wessex HC.2 for civilian use, and the following year the Wessex



Mk 60 came into being. It was powered by two Mk 660P 1,350 shp (1070 kW) Gnome turbine engines (civil equivalent to the standard military Gnomes Mk 110/111 arrangement) carried full VFR/IFR avionics, had a sound-proof and heated main cabin, special protective floor, and could carry up to 15 survivors in a typical rescue operation or 10 passengers in comfort, or eight stretchers and two seated casualties plus their medical attendant. Since many of Bristow's contracts were in Third World countries, the company fitted large forward air intake debris filters to some of its Wessex aircraft, of a different shape from the standard HC.2 and HU.5 filter. The civilian Wessex made its debut with Bristow in October 1965 at Tetney, near Grimsby, and at Yarmouth, serving North Sea gas and oil platforms. In total, Bristow placed an order for 15 examples, these being delivered between September 1966 and 1971. In addition, it purchased four second-hand examples, including two Mk 53s ex-Ghana Air Force and two Mk 54 ex-Brunei Air Wing, which it civilianised to Mk 60 standard and registered as G-BGER, G-BGWT, G-BAWJ and G-BBCE respectively. Bristow's Wessex aircraft flew in every continent, particularly on oil rigs and oil exploration sites, in most cases receiving civil registrations of the country in which they operated. In August 1981, following three unexplained fatal accidents, Bristow decided to ground its

Wessex fleet permanently. A number of these later found their way to other civil operators.

WESSEX IN ACTION

As early as 1955 the French Navy had used the Sikorsky SH-34 Seabat during the Algerian War of Independence of 1956-62, armed with machine guns from the cabin door and windows, as well as with rocket batteries. The US Army, too, deployed twenty CH-34As to Vietnam pending the introduction into widespread service of the more suitable Bell UH-1 Iroquois and successfully carried out missions ranging from combat assault to aeromedical evacuation and general cargo transport. The UH-34D was the first US Marine Corps helicopter to be committed to Vietnam and remained in use there even after the entry into service of the UH-1B Iroquois. Four UH-34Ds, known as Stingers and fitted with machine guns and FFAR rockets, were also among the first pioneering gunship helicopters in the theatre. The combat tradition of the H-34 was continued with the Westland Wessex in British service, where the machine rose to the occasion whenever required. In fact, during its lifetime, the Wessex was present in all major conflicts and flashpoints in which Britain was drawn in. Borneo, during the Indonesian Confrontation, and the Falklands War, were the two major theatres in which the Wessex was most involved.



Wessex 52, 588, Iraqi AF



Wessex HC.2 085, Uruguay Navy, ex-XT603 of No.2 Flying Training School



Wessex HU.5, WA, No.707 NAS Red Dragon Flight, with HRH the Prince of Wales at the controls. December 1974

Indonesian Confrontation 1962-1966

From 1948 British and Commonwealth ground and air forces had been deployed to Malaya to assist the Malayan authorities counter the communist terrorist threat, both the RAF and Fleet Air Arm being drawn in on the British side. In 1960 the conflict escalated with the involvement of nearby Indonesia, whose aim was to absorb Malaya, Singapore, the Philippines, Brunei and North Borneo into a Communist Indonesian empire, and towards this purpose in late 1962 it instigated internal trouble in Brunei. Thus the long conflict, which lasted until 1966, is known collectively as the Malayan and Indonesian Confrontation (*Konfrontasi* in the Indonesian and Malay language), but the Wessex was involved in the latter part which was fought mainly in the jungles of Borneo.

From 1962 the two new Commando carriers of the Royal Navy became available for the transport and landing of Royal Marines ashore. In December HMS *Albion* arrived off North Borneo with a mixed force of 12 Wessex Commando Mk.1s of No. 845 NAS and eight Whirlwind HAS.7

Wessex HC.2 XS678, of the Omani Air Force. (Adrian Balch)

Commandos of No. 846 NAS. From the 14th, these disembarked ashore with troops to Kuching to provide much needed support to the RAF's Belvedere HC.1s and Sycamore HC.14s. The Navy also set up a Forward Operating Base at Nanga Gat, some 100 miles (161 km) inland close to the Indonesian border, while detachments were maintained at Labuan, Sibul, Belaga and Simanggang.

In March 1964 HMS *Bulwark* relieved *Albion* on station but No. 845 and 846 remained in the theatre, operating in the support and SAR roles until both units sailed home on *Bulwark* in September

1965. The Wessex Commando Mk 1 had proved its worth in spite of its single engine limitations operating in tropically high temperatures and a humid jungle climate. No. 848 NAS, equipped with the new and more capable Wessex HU.5, had arrived off Borneo from the UK in June 1965 on board *Albion*. The unit disembarked and operated as a headquarters flight and four different flights stationed in jungle areas in Nanga Gat, Sibul, Bario and on the island base of Labuan. Very exact flying was required by the three Wessex squadrons to successfully land and take-off on a regular basis from primary jungle clearings not more than 80 ft (24.4 m) in diameter into which vertical descents from 200 ft (61 m) had to be made, in some occasions even at night. Here the higher power of the HU.5 made all the difference especially when such descents and ascents had to be made at full load. This was the only way by which British troops could be moved rapidly through impenetrable jungle to otherwise inaccessible forward areas.

A *coup d'état* in the Indonesian capital in September 1965 effectively brought fighting to a conclusion, the confrontation formally ending in August 1966. Re-united that same month, No. 848 sailed home, again in *Albion*.

During the Confrontation, 845 and 846 NAS became known as 'Junglie' Squadrons, a name that still sticks today. With No. 848, the three naval squadrons flew between them thousands of sorties, transporting troops and equipment to inaccessible areas in the swamps and tropical jungles of Borneo. Although it is the Vietnam War that is known as the 'helicopter war', Borneo represented the first major conflict in which helicopters were used to move large concentrations of troops.

THE FALKLANDS WAR

When Argentina invaded the Falkland Islands in early 1982 and Britain decided to regain them, the Wessex was in the twilight of its frontline career. Indeed several units had already converted to the Sea King, both for anti-submarine warfare as well as in the Commando role while other



ROYAL AUSTRALIAN NAVY SQUADRONS

Squadron	Base	From-to	Version	Serial
HT 723	Nowra	1/1/1976 - 2/84	HAS.31B	N7-215/825
	(Home base)			
	Nowra	7/87 - 31/12/89	HAS.31B	
	(Home base)			
HT 725	Nowra	7/87 - 31/12/89	HAS.31B	N7-222/832
	HMAS Success Flt	7/87 - 31/12/89	HAS.31B	N7-218/828
HT 725	Nowra	1/11/62 - 27/12/ 75	HAS.31A/B	N7-201/881
	(Home base)			
HT 816	Nowra	9/2/84 - 30/6/87	HAS.31B	N7-220/830
	(Home base)			
HT 817	Nowra	18/7/63 - 2/76	HAS.31A/B	N7-212/822
	(Home base)			
	HMAS Melbourne	various tours	HAS.31A/B	N7-205/815
	HMAS Sydney (det)	1965- 72	HAS.31A/B	



Wessex HU.5 XR527 coded C on air show display in June 1980.

units, already disbanded, were newly reformed on Wessex. Although the most prolific helicopter of the war was the Sea King, the Wessex aircraft that took part distinguished themselves in the most intense postwar conflict in which Britain was involved.

The two types of Wessex versions that sailed south as part of Operation

Corporate in 1982 were the HAS.3 for anti-submarine duties and the HU.5 for troop transport and assault landing. The Wessex force that departed Britain in April consisted of four No. 737 NAS HAS.3s (two on each of the County class destroyers HMS *Glamorgan* and *Antrim*), and of no less than 38 HU.5s distributed as follows:

Ten from No. 845 NAS at Ascension Island and on RFA *Resource* and

Tidespring;

- twelve from No. 848 NAS consisting of four flights, A to D, on RFA *Olna*, *Olwen* and *Regent* and on the container ship MV *Atlantic Conveyor*; and - sixteen from No. 847 NAS which departed later on the container ship MV *Atlantic Causeway* and on the helicopter support ship RFA *Engadine*.

The larger ships, the carriers HMS *Invincible* and *Hermes*, and the assault ships HMS *Intrepid* and *Fearless*, carried Sea Kings.

This is of course the deployment as it was hurriedly gathered for the Task Force, and aircraft cross-decked among ships as required and as normally happens in war conditions. For example, during the course of the conflict No. 845 was embarked at various stages on no less than 14 different vessels including HMS *Invincible* and *Intrepid*, and RFA *Fort Austin*, *Resource* and *Tidepool*. Moreover, other Wessex HU.5s were transported to the theatre during the war.

It was the Wessex that first went into action when two HU.5s from *Tidespring* and one HAS.3 from *Antrim*, part of a mini-force that arrived in the Falklands before the main Task Force, landed a reconnaissance SAS party on South Georgia on 21 April. Intense snow and high winds, however, rendered visibility impossible and next day the commandos asked to be withdrawn. Two Wessex HU.5s (XT464 and XT473), again from *Tidespring*, and *Antrim*'s HAS.3 XP142 went to pick them up, but the two HU.5s, while attempting to take-off, crashed owing to loss of visible horizon due to the snow, their crew and SAS party being rescued by the HAS.3 in several trips. On 25 April the same HAS.3 followed up a sub-

Wessex HC.2 065, ex-Ghana AF G-630, then in service with the Uruguay Navy 1996. It is unusual in that it has a radome on the nose. (Adrian Balch)

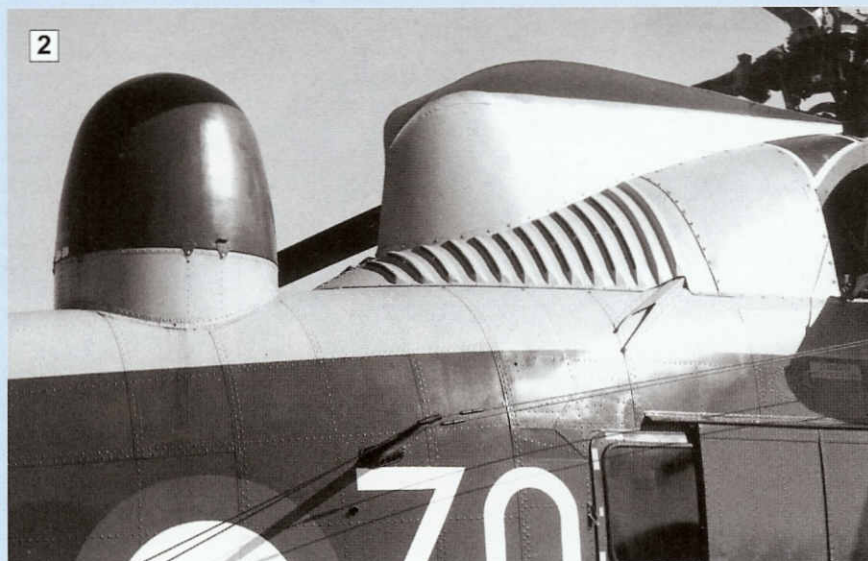
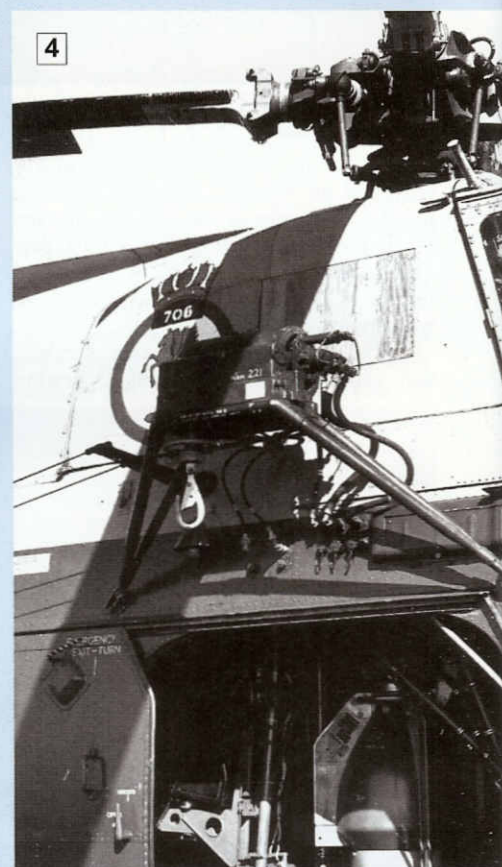




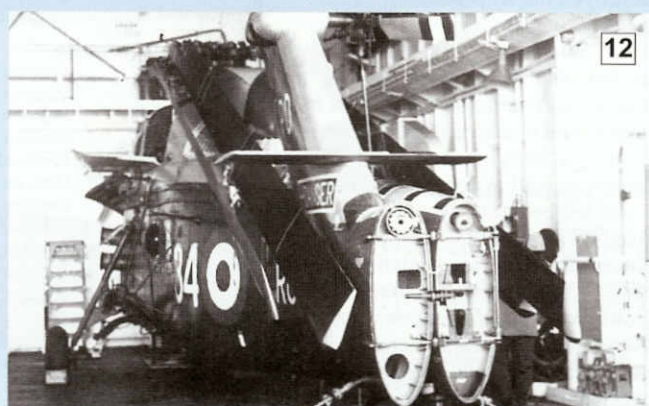
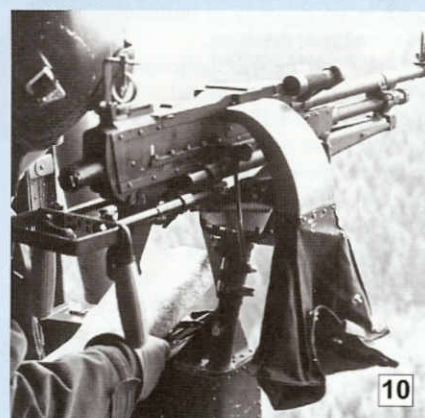
Wessex In Detail

PICTURES BY ALAN W. HALL FROM RNAS CULDROSE

1. Wessex HAS.3 - interior details 2. Wessex HAS.3 humpback details 3. Wessex HAS.3 nose intake closeup. The two spherical objects behind the grill are in fact fire extinguishers. 4. Wessex HAS.3 rescue winch closeup. 5. Wessex HAS.3 front fuselage closeup. 6. Standard Wessex tail-wheel, seen here on an HAS.3. 7. Wessex HAS.3 main wheel closeup, showing floatation packs stowed into the wheel hubs. These could be inflated into large ball floats in case the machine had to ditch.



8. Wessex HC.2 front fuselage closeup, showing the difference in the single large exhaust pipe of the Gnome-powered versions of the Wessex. 9. Wessex HAS.3 exhaust area closeup. Note the differences between this and the picture above. 10. Wessex HC.2's 7.62 mm General Purpose Machine Gun being fired from a swivel in the entrance door. Spent cartridge cases are collected in a canister on the right hand side of the gun. 11. Wessex HAS.3 tail rotor closeup, showing also anti-collision and navigation lights on top. 12. Wessex HAS.3 folded rear tail hinge. With both the rotors and the tail folded the Wessex packed into a very small area most suitable for hangar stowage on board ship.





Wessex HU.5 from HMS Bulwark carrying an underslung load. (Adrian Balch)

marine scent detected by *Antrim*, made sonar contact and attacked it, seriously damaging it by depth charges. The surfacing submarine, the *Santa Fe*, was torpedoed by HMS *Brilliant*'s Lynx HAS.2 and finished off by AS.12 missiles fired by HMS *Plymouth*'s and *Endurance*'s Wasp HAS.1s on her way to harbour where she was beached, disabled.

A great loss of helicopters occurred on 25 May when *Atlantic Conveyor* was sunk by an AM.39 Exocet missile fired by an Argentine Super Etendard. In addition to three Chinook HC.1s of the RAF and an RN Lynx HAS.2, six Wessex HU.5s of No. 848 NAS D Flight were lost with the ship: XS480, XS495, XS499, XS512, XT476 and XT483.

HMS *Glamorgan*'s Wessex HAS.3 was destroyed on 12 June when a land-launched Exocet hit the aft end of the destroyer and, although it did not explode, its propellant started a furious fire that destroyed the ship's helicopter hangar and XM837.

The other HU.5s, particularly those of No. 847 NAS, were landed at Port Stanley and thereafter in various locations in the Falklands, giving support to land forces in carrying troops, weapons and freight as well as for casevac purposes.

The battle for the Falklands was a fixed-wing aircraft's war, particularly the Harrier/Sea Harrier which provided air cover and ground attack missions. However, it was helicopters that provided the much needed ship-shore logistical support, troop transportation and casualty evacuation for the British seaborne invad-

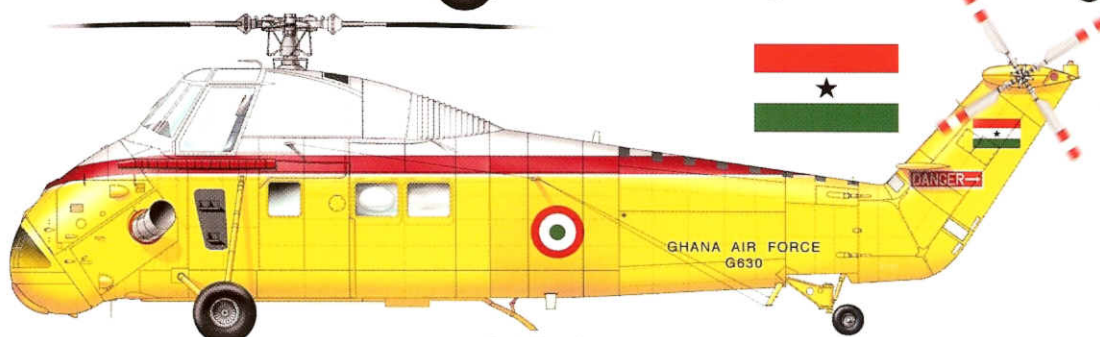
ing force. Since three of the four RAF Chinooks perished with the *Atlantic Conveyor*, the greatest responsibility fell on the Sea King HC.4s and on the Wessex HU.5s. In the anti-submarine warfare role, only four Wessex HAS.3s formed part of the Task Force, so that most of the sorties

were carried out by some 36 Sea King HAS.2/2As and HAS.5s. But it was Wessex HAS.3 XP142 and its crew that became the helicopter heroes of the war, the actual machine being retired at the Fleet Air Arm Museum at Yeovilton following the end of hostilities.

WESTLAND WESSEX KITS AND ACCESSORIES

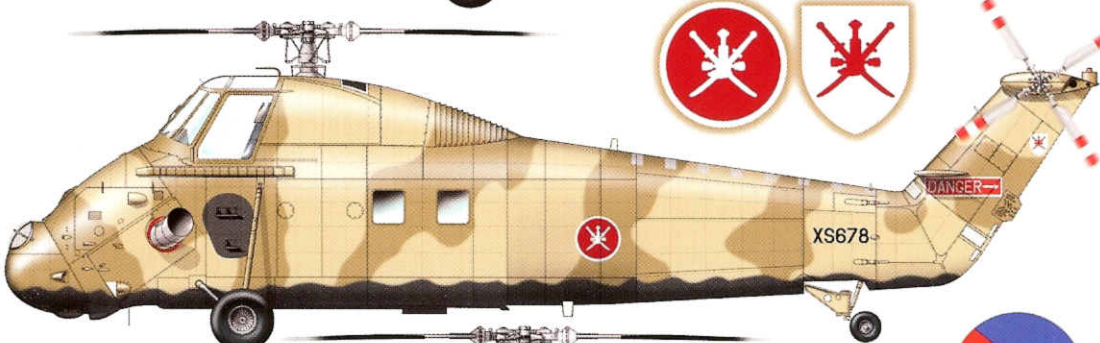
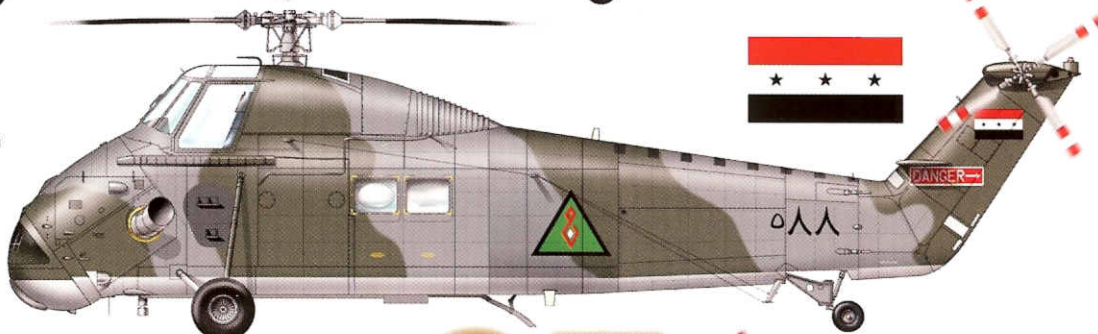
Scale Kits	Type	Manufacturer	Reference	Notes
1:72	Wessex	Chematic	CH72247	Ex-Frog
1:72	Wessex	Frog	FROGF247	Complete kit
1:72	Wessex HU.5	Italeri	IT0082	
1:72	Wessex HAS.3	Italeri	IT1258	
1:72	Wessex HAS.1/31	Novo	NOV247	Original Frog decals
1:72	Wessex HU.5/HAS.31	Matchbox	PK133	
1:72	Wessex HU.5	Matchbox	PK136	
1:72	Wessex HAS.3	Revell	RV4439	
1:48	Wessex	Revell	RV4484	Queen's Flight
Decals				
1:72	Wessex	Modeldecals	MD018	
1:72	Wessex	Modeldecals	MD095	Also Phantom
1:72	Wessex	Modeldecals	MD096	Also Mirage
1:72	Wessex	Modeldecals	MD099	Also Chinook
1:72	Wessex	Aussie decals	AUS48006	RAAN
1:48	Wessex	Aussie decals	AUS72009	RAAN
Accessories				
1:72	Wessex	Airwaves	AEC72001	Upgrade set
1:72	Wessex	Airwaves	AEC72192	HU.5 upgrade
1:72	Wessex HU.5	Airwaves	AES72006	Weapons
1:72	Wessex HC.2	Airwaves	AES72044	New nose
1:72	Wessex HU.5	Cobra	CC72003	cockpit detail
1:72	Wessex HAS.3	Cobra	CC72004	cockpit detail
1:72	Wessex HC.2	DB Productions	DB42	New nose
1:72	Wessex HC.2/HU.5	Maintrack	MK7206	Upgrade set
1:72	Wessex HAS.3	Maintrack	MKAP06	radome and fin
1:72	Wessex HAS.3	Maintrack	MKAP07	nose filter
1:72	Wessex HC.2	Maintrack	MKAP08	
1:72	Wessex	Maintrack	MKAP10	rescue hoist
1:72	Wessex HU.5	Pavla	PAVC7251	cockpit detail
1:72	Wessex HA.3	Pavla	PAVU7274	upgrade set

Westland Wessex Mk.54,
AMDB-101/WB, Brunei
Defence Force. ICI Port
Dickson Green overall with
Dayglo Orange areas on nose,
underside and rear of fuse-
lage; black serial on fuselage
sides, white code on fin.
Dayglo Orange/Yellow rear
section of engine cowlings



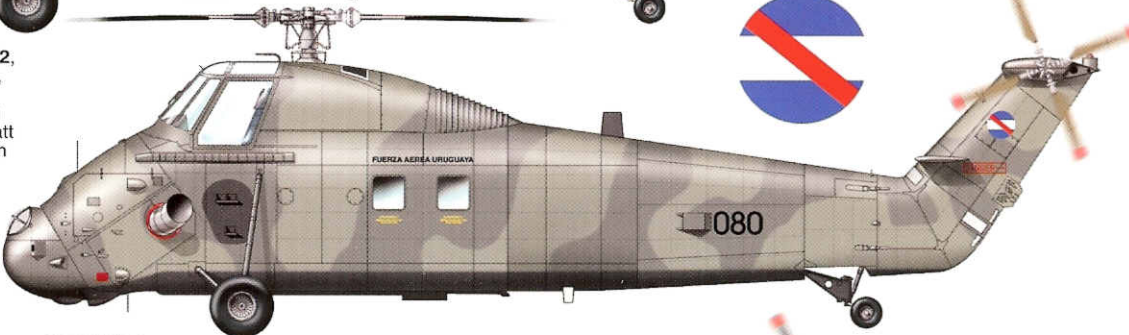
Westland Wessex Mk.52,
G. 630, Ghana Air Force,
1966. Golden Yellow over-
all with white fuselage top
and red cheatline; lettering
in black

Westland Wessex Mk.52,
588, Iraqi Air Force. Dark
Green/Dark Sea Grey
upper surfaces with Silver
undersides; black serial on
fuselage sides



Westland Wessex HC.2,
XS678, Omani Air Force
markings. Light Stone/Dark
Earth upper surfaces with
black undersides; black
serial. National markings
consist of roundels on
fuselage sides and shield
on fin

Westland Wessex HC.2,
080, Uruguay Air Force,
September 2003. Matt
Medium (Lichen) Green
BS4800.12B.25 and Matt
(NATO IRR) Dark Green
BSC241 on upper sur-
faces with black under-
sides; lettering in
black. National mark-
ing on fin



Westland Wessex HC.2,
085, Uruguay Navy (ex-
XT603, No. 2 Flying
Training School). Dark Sea
Grey/Dark Green upper
surfaces with black under-
sides; Signal Red nose
and fuselage band.
Lettering in black with '085'
carried on nose and fin



Above: Wessex HAS.1 demonstrates its man lifting capabilities at one of the Farnborough air shows in the 1960s (Adrian Balch)



Above: Wessex HAS.1 in an attractive high visibility colour scheme when in use by A&AEE Boscombe Down. Below: Wessex Mk.60 G-AVMC was sold by Bristow Helicopters to Sykes Helicopters and was seen at Redhill in 1961. (Adrian Balch)



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