

CULDROSE FINEST

CULDROSE FINEST

Royal Navy Air Station (RNAS) Culdrose has the magic to those who are attracted to naval aviation. It is one of Europe's largest air bases with over hundred active helicopters and fixed wing aircraft. These are organised in no less than ten squadrons and several other units. RNAS Culdrose forms together with RNAS Yeovilton the core element on the ground for the Fleet Air Arm. From here embarking on the naval ships is organised. Also from attached squadrons detachments are deployed to other bases such as the SAR unit on Prestwick.

MAIN ROLE

Originally commissioned as HMS Seahawk in 1947 the initial plans were to form a naval training base but it grew to something much more than that. RNAS Culdrose saw trials of the first Royal Navy jets and became a home for carrier based aircraft while many different types of aircraft were active on this airfield during the years. Today the balance between helicopters and fixed wing aircraft shifted to the helicopters when the Sea Harrier lost its active role on the aircraft carriers. This role was adopted by RAF Harriers Gr. 7 from RAF Cottesmore. The training element became and stayed important during the years and currently RNAS Culdrose is responsible for the Operational and Advanced Flying Training of helicopter pilots, observers and other aircrew while ground related tasks such as aircraft handling or air traffic control are also specialised in training courses.

SOPHISTICATED MERLIN

The Merlin HM-1's from Culdrose serve in four squadrons (814, 820, 824 and 829 Naval Air Squadron) and the type is a really multi role workhorse capable to operate under extreme weather conditions day and night.. Primarily tasked with the ASW role the Merlin is equipped with Thales/Marconi Sonar FLASH (Folding Light Acoustic System for Helicopters) active dipping sonar equipment, Orange Reaper Electronic Support Measures and mounted under the nose a powerful Ferranti 'Blue Kestrel' 5000 maritime surveillance radar with multiple targets tracking facility. The ASQ903 acoustic processor processes data returned by dunking sonar or sonobuoys. FLASH is suitable for both deep and shallow water operations. The secondary role is to watch the sea surface, performing long range sea surveillance but the Merlin can also operate in Command & Control, evacuation, transport and SAR missions. While arms to attack submarines such as four BAE 'Stingray' homing torpedoes and Mk.11 depth charges are just standard equipment, the naval authorities decided not to carry an advanced attack system for surface targets such as Harpoon rockets. But with the necessary wiring already installed this option could be adopted in future. The Merlin is named after the powerful sorcerer and is one of the most sophisticated designs for this work. With this highly effective multi-role platform Agusta-Westland designed and produced a really jewel, considered as the most comprehensively equipped ASW

helicopter in the world. The avionic system is based on two MIL STD 1553B digital data buses which link the basic management system and missions system. Avionics are of European origin and very advanced such as Alenia Marconi Systems aircraft management computer, Smiths Industries OMI SEP 2 dual redundant digital air flight control system, BAE Systems LINS300 ring laser gyroscope inertial reference unit, LISA-4000 strapdown altitude heading reference system (AHRS), Thales 91E Doppler velocity sensor, Cossor global positioning sensor, two Thales AHV-16 radar altimeters and a BAE system low-air speed sensor and air data system. Upgrade programmes to ensure highly advanced qualities are scheduled from 2013 onwards and awarded to Lockheed Martin UK for its proposal of the Merlin Capability Sustainment Plus (Merlin CSP) program.

FROM SHIP AND SHORE

Both 814 and 820 Naval Air Squadron provides carrier based anti submarine warfare from Invincible class aircraft carriers or helicopter assault ships such as the HMS Ocean. Equally 829 Squadron is doing the same job from type 23 frigates of the Royal Navy which were converted to accept the Merlin. The fourth Merlin squadron, 824 Naval Air Squadron performs a training task on Culdrose and trains students of varying degrees of aviation experience ranging from pilots, observers air crewman and engineers prior to becoming a front line ASW operator. Part of 824 Squadron is the Merlin Training Facility (MTF) and comprises a full motion Cockpit Dynamic Simulator (CDS) with state of the art graphics but also realistic training simulation systems for crew members with different tasks such as the Rear Crew Trainer (RCT) and Mechanical Systems Trainer (MST) and ability for Computer Based Training (CBT) in classrooms. The twelve months course is divided in an Advanced Conversion Phase (ACP) and Operational Conversion Phase (OCP) and encompasses all types of flying, focussed mainly on ASW but also incorporating large elements of Anti-Surface Warfare (ASuW) and SAR techniques such as winching and load-lifting.

Proceeding with helicopter flights including deck landings to learn the specific landing techniques in conditions to maximal sea state 6 and up to 50 kts cross winds and the use of the rapid securing device called PRISM which consist of a 'harpoon' in a grid on the deck. The Merlin Deep Maintenance Facility (MDMF) performs maintenance and flight checks and Agusta Westland provides support under the Integrated Merlin Operation Support (IMOS) contract. MDMF is manned by Royal Navy, Royal Air Force and Serco technicians forming a cohesive group and are very positive about the helicopter. Merlin's do have a longer maintenance interval than Sea Kings and do have less complicated rotor head and transmission system which is a delight to the maintenance people.

FLYING CLASSROOM

The Fleet Air Arm's Observer students are after undergoing initial officer training at Britannia Royal Naval College Dartmouth (BRNC) being trained in fixed wing aircraft from 750 Naval Air Squadron. With their motto 'Teach and Strike' they learn all ins

and out from observing and sharpening their sense perception to be prepared for a job with responsibilities. The seven months course involves all aspects of airborne navigation and air traffic control, radio and radar techniques and some basic tactical skills, first instruction in classrooms and computer controlled simulator followed later on with sorties in the air. Their training aircraft, the Handley Page Jetstream T Mk.2 is a well known appearance at air events but will see eventually replacement with Raytheon Super King Airs which is set on 2010. The twin engine aircraft which is nicknamed 'the flying classroom' saw extensive maintenance of the Turbomeca Astazou 16D turboprops in the last years. Those engines are different from most other produced Jetstreams such as for the RAF or civilian use, which are equipped with Garrett engines with longer overhaul interval.

Finding spare parts is a hard time business. Typically on Royal Navy Jetstreams are the nose mounted radars in which it externally differs from the civilian Jetstream 200 series. Next to a pilot and observer front seat the Jetstream has a third crew seat in the cockpit and two radar/navigation consoles on the right hand side of the cabin from where students conduct most of their training leaving three extra seats in the back just for passengers. After completion of the course students can choose or are selected to fly on Royal Navy Lynx, Sea King or Merlin helicopters. The training task is just like the SAR task under discussion to hand over under civilian control in the future in order to find defence cut backs. For practical reasons the SAR force is more likely a first item to bring under one central command and or under civilian control.

MOST RELIABLE

If there is one helicopter which earns the label to be a major success it will be the Westland Sea King helicopter. Since entering service with the Royal Navy on 11 August 1969 the Sea King as transformed the UK's ASW and SAR operations and proved outstanding in military operations. Battle proven in the Falklands, two Gulf Wars and current operations in Afghanistan, the Sea King's versatility, adaptability and reliability from the arctic to the desert has been phenomenal. One of the Sea King's greatest strengths is its range, endurance and all weather capability. Several versions saw action within the Fleet Air Arm and currently the Sea King equips four squadrons at RNAS Culdrose including three squadrons concentrating on the Airborne Surveillance and Control task with the Sea King ASaC Mk. 7 and one Search & Rescue squadron with the Sea King HU.5. The Sea King HC-4 commando version for assault operations is based at RNAS Yeovilton.

EARLY WARNING A NECESSITY

Britain learned a hard lesson in the Falkland War when it lacked an AEW platform and in hostile actions British ships were targeted and destroyed which could have been prevented with a capable AEW asset deployed in the area. A powerful Thales Searchwater 2000 radar externally mounted on a swivel arm in a inflatable dome housing which can be turned down in flight was fitted on the Sea King. A simple and effective solution created within a short period of thinking after the Falklands experience. Two frontline squadrons operates the Sea King ASaC Mk. 7 which are 854 Naval Air Squadron with the motto; 'Fortune helps the daring ' and 857 Naval Air

Squadron with motto 'Prepared in Minds & Resources' Both Squadrons operates three helicopters with five crews each. Both Squadrons do embark temporarily on carriers like the HMS Ark Royal or HMS Ocean with a scope for several types of missions. A Single pilot flies the aircraft with two observers operating the state-of-the-art radar and surveillance systems in the back of the helicopter. The 849 Naval Air Squadron with motto 'The first to see' has the main task to train student observers when having finished the Basic Observer Course with 750 Squadron Jetstreams. After basic handling with the Sea King the focus is on navigation and radar handling and secondary roles such as winching. When going to Operational Conversion Phase disciplines such as Anti Air warfare, Anti Surface warfare, Fighter Control, Surveillance and Close Air Support are in the course. Fighter control is an important part of the training. The Sea King ASaC 7 operates normally in this role when operating in a task force which is usually the case when embarked.

The fighter controllers works together with strike elements and rotary wing aircraft, not only for the Fleet Air Arm but also for Royal Air Force or Army Air Corps or even for aircraft from allied forces. The helicopter operates from the home base or carrier in task force in the control of seaways and force protection of ships and is called 'the eyes of the fleet'. The radar of the ASaC 7 can detect low flying attack aircraft and can track simultaneously 400 targets providing interception/attack control and over-the-horizon targeting for surface launched weapon systems. The Orange Crop Electronic Support Measures equipment is capable of passively detecting enemy ships and aircraft radar emissions. The ASaC 7 can also be deployed to achieve long-range detection of hostile ships and fast attack aircraft. The ASaC 7 is when embedded in a task force and operating in combined air operations a mighty weapon and a highly valuable air asset.

SKILLS AND BRAVERY

A familiar sight over the Cornish coastline are the 771 Naval Air Squadrons Sea King HU.5 helicopters with their typical livery of grey and bright red. On the nose is a card symbol with the ace of clubs and no one seems to know exactly the history of this symbol but perhaps it is rudimentary from a period when squadrons received such symbols like ace of clubs, spades, hearts or diamonds. Anyway many people will have been delighted to see the ace of clubs approaching in the air when experiencing the nastiest moments on the sea. The squadron crews are considered heroes while every year they save many lives in some of the most hazardous conditions imaginable, often putting their own lives at risk. With their motto; 'Not to us alone' they do splendid work which is recognized with many awards.

771 Naval Air Squadron is responsible for SAR in Cornwall, the Isles of Scilly and the Western English Channel, in total an area of approximately 200 nautical miles (400 km). It administers the Sea Kings on detachment at Prestwick. On the isles of Scilly is an emergency refuelling unit. An average for over 220 SAR missions every year is reached. Typically missions include long range medical evacuation from ships at sea with hi-line transfer, assistance to vessels in distress, but also to swimmers, divers or surfers in danger. To the land area cliff fallers or people in distress at desolate areas such as the Dartmoor are classic missions or special transport such as transfers from

patients to another hospital. The Sea King HU.5 has an all weather capability and missions sometimes collaborate with neighbouring Irish or French helicopters. 771 NAS is at immediate notice to scramble for SAR missions at 15-minute alert status from sunrise to sunset, and 45 minutes at night hours but when every second counts they usually are within five minutes airborne. The Sea King has a night vision goggles adapted cockpit and a digital autopilot with coupled navigation system. Pilots claim the helicopter not only looks right and feels right but is the best suitable type for this work and the conviction exist the type is going to fly for another long time. To mark 40 years of service, one Sea King was painted in the original blue Royal Navy colour scheme.

FRADU

A Special unit at Culdrose Naval Air Station is the Fleet Requirements and Air Direction Unit (FRADU) operated by the contractor Serco Defence and Aerospace with 14 Bae Hawk T1 advanced jet trainer aircraft on lease to the Royal Navy from the RAF. Two of these aircraft are permanently based to Yeovilton Naval Air Station detached to the Naval Flying Standards Flight. One of the tasks of FRADU is to train crews of Royal Navy vessels in air defence by performing fake attacks. For this purpose all FRADU pilots are ex-military with fast jet backgrounds ranging from Lightning's, Jaguars, Tornado's, to the Red Arrows and are of course very skilled. Other tasks include fighter controller training ('D-school') for the Royal Navy School of Fighter Control, AEW exercises to train observers in the AEW role on 849, 854 and 857 Squadrons and other forms of support training. Sometimes missions are in conjunction with Flag Officer Sea Training helicopters (FOST) or aircraft from Flight refuelling Aviation (FRA) operating Dassault Falcon 20 aircraft from Bournemouth providing slower targets and radar threat simulation in addition to target towing. Part of the unit forms a display team with the name Black Seahawks, well known at air shows in the United Kingdom. The hawks are wearing a special fin colour scheme with Fly Navy 100 marking the 100 birthday celebration of naval flying.

Learning flight deck operations

DUMMY DECK

Ground personnel do have their own facility to learn aircraft handling and fire fighting. The Royal Naval School of Flight Deck Operations (RNSFDO) is in charge in the aircraft handling branch. On the ground in front of some hangars there is simulated aircraft carrier deck painted on the ground. Students do have the opportunity to act if they were on the ship. Aircraft handling is serious business and a truly job to learn. On the 'Dummy Deck' the fundamentals of aircraft launch and recovery procedures are simulated by using live Harrier aircraft and helicopters. Those Harriers are Sea Harriers left from deactivated squadrons and carefully preserved inside the hangars. Sometimes the engines are running to make it even more realistic for the students who must find confidence in a busy, noisy environment getting used to the urgency of handling. Since the Royal Navy Sea Harriers were withdrawn from use the task was given to RAF Harrier Gr.7A of the Naval Strike Wing. The school also trains personnel of the RAF and Army who will be involved in operating aircraft at sea.

Future plans foresee two new Queen Elisabeth class aircraft carriers with JSF aircraft. Aircraft handling will stay an important skill to learn.

OTHER UNITS

Two Dauphins are in use for Flag Officer Sea Training (FOST) on settings of basic and advanced operational training on behalf of the Royal Navy and other overseas naval forces. The main task is to certify crews and vessels as fit to join the operational fleet. The two helicopters are owned by British International Helicopters and on lease to the Royal Navy and based at Plymouth but frequently seen at RNAS Culdrose. The aircrews are civilian but do have previous military experience. As part of the D.H.F.S. the 705 Naval Air Squadron provides instrument flying, navigation, night flying and SAR techniques using the black and yellow Aerospatiale AS.350 Squirrel HT.1 in pooled system between the three services in the military (Army, Navy & Air Force). For this purpose the Squirrels are available at RNAS Culdrose. The base is indeed a super base with its big collection of different aircraft.

Kees Otten & Wim Das