

Magic Merlins

Dirk Jan de Ridder and Menso van Westrhenen visit the Portuguese Air Force's Esquadra 751 at Montijo Air Base as the squadron celebrates its 35th anniversary

To celebrate the unit's 35th anniversary EH101-514 19604 has been painted with subtle puma markings - look closely! Menso van Westrhenen



'So others may live'



A rescue swimmer, carrying a training dummy, is hoisted up after a quick dip in the Atlantic Ocean. Menso van Westrhenen

THE PORTUGUESE Air

Force's (Força Aérea Portuguesa - FAP) Esquadra 751 'Pumas' was named after the helicopters received when the squadron was commissioned in April 1978 - the Aérospatiale SA330 Puma. But, by the turn of the century, the SA330 required replacing and, after a thorough evaluation that also considered the Sikorsky S92 and Eurocopter Cougar, the AgustaWestland EH101 Merlin was selected. Twelve Merlins were delivered between December 2004 and July 2006, comprising six EH101-514s for basic search and rescue (SAR), two EH101-515s for fishery patrol (SIFICAP) and four EH101-516s for combat search and rescue (CSAR). All helicopters are



used for the squadron's primary mission of SAR, while the latter two models are equipped for their respective secondary role. Standard features in all three variants include a primary and a secondary winch, a NITESUN search light, a forward-looking infrared (FLIR) camera, a Galileo Avionica search radar - with the ability to monitor 32 surface targets simultaneously - and emergency floats. The helicopters are also night vision goggle compatible. For passenger transport, front-facing seats or side-facing seats for 35 fully-equipped soldiers can be installed. Other missions undertaken by Esquadra 751 include aero-medical evacuation, air logistic support operations and maritime surveillance.

Early problems

Maintenance issues and a lack of experienced crews shortly after the Merlin's introduction in 2005 sparked the FAP to bring the SA330 back into service a year later. A shortage of spares led to half the Merlin fleet being grounded in order to provide parts for the other six helicopters. In 2008 a contract was signed with AgustaWestland which saw the manufacturer take responsibility for second-level maintenance of the helicopters, as well as the provision of spare parts and technical support, leading to the entire fleet to become operational again.

Big responsibility

Under the command of Lt Col João Carita, one of only three pilots in the world with more than 2,000 hours on the EH101, Esquadra 751 consists of around 100 personnel including some 25 pilots, 12 systems

operators and nearly 20 rescue swimmers. Defence budget cuts have affected the squadron's flight hours, but the importance of its mission is such that other FAP squadrons have been hit harder. The number of flight hours logged by Esquadra 751 decreased from 2,208 in 2011 to 1,744 in 2012. However, in 2011 the squadron notched up 608 hours on operational SAR missions, saving 173 lives, decreasing to 430 hours and 157 lives in 2012. Each pilot flies an average of between 150 and 180 hours per year, including rescue missions, leaving only around 100 hours for training. One pilot told AFM he had been scrambled on each of his last three consecutive 24-hour shifts. If there is a sudden escalation in rescue missions, or an increase in flying distances to emergency locations, pilots undertake less training.

At six million square kilometres, Portugal is the second largest area of SAR responsibility in the world, ▶

Secondary roles

The EH101-515s' SIFICAP adaptations comprise a cabin console behind the cockpit to operate the 360-degree scanning radar and other sensors, an external loudspeaker and an additional bubble window on the starboard side.

CSAR mission equipment, such as armoured plating and a full defensive aids suite consisting of a radar warning receiver, missile warning system and countermeasures dispensing system feature on the EH101-516s. However, if the variant is unavailable for combat missions these defensive measures can be installed in the EH101-514. In addition, the CSAR Merlins' main rotor blades and tail rotor have a fully automatic folding system for operations from landing platform docks. The aircraft are also configured for air-to-air and hover-in-flight refuelling - although these capabilities are not in use currently.

Busier than ever

During the 28 years the squadron flew the Puma 1,800 lives were saved (an average of 64 per year). In November 2012, less than eight years after its service introduction, the EH101 had already saved its 1,000th life. Undeniably the squadron is busier than ever, even on a limited budget. Pilots with previous experience on the Puma told AFM they preferred the older aircraft for hovering, but they would choose the EH101 in all other aspects. The Puma's design meant it was very easy for pilots to look down, whereas they are seated further away from the side windows in the EH101 making communication with the systems operator hanging out of the cargo door crucial during winch operations.



SAR training flights are often combined with other training elements such as low level flying. Menso van Westrhenen

with only Canada being greater. Besides operating from the squadron's home base of Montijo, near Lisbon, two Merlin crews are detached permanently to Lajes Air Base in the Azores (some 850 miles west of the Portuguese mainland) and a third crew to Porto Santo Airport, 440 miles west of Casablanca in Morocco. All three locations are provided with round-the-clock SAR coverage and, in order to have the helicopters deployed as long as possible, the crews only fly when called into action. The response time is 30 minutes during the day and 45 minutes at night. Crews are usually deployed for two weeks, with those at Lajes working alternate 12 and 24-hour shifts and their Porto Santo colleagues on standby 24/7 for the duration of their deployment. Lajes tends to get the most alert calls, due to tropical storms and its strategic position astride major shipping lanes between Europe and the Americas.



Above: A rescue swimmer prepares to be hoisted down to a vessel. Menso van Westrhenen

"We often fly OEI [one engine inoperative] profiles in long-range missions because it can give us a 12% saving in fuel consumption. When someone's life is at risk, in the middle of the Atlantic at night in stormy weather, it can make a difference!"

Today's life-savers

SAR crews comprise a pilot-in-command, co-pilot, systems operator, rescue swimmer and flight nurse. While the co-pilot directs, plans and executes the flight plan, the pilot-in-command is responsible for all decisions taken by any crew

Below: The systems operator and rescue swimmer watch as they draw closer to a vessel, shortly before opening the door to start their training. Menso van Westrhenen



member that will influence the mission. The systems operator guides the pilots over a ship or casualty in the water and operates the winch. Of all the crew members, the rescue swimmer is the most exposed to the elements. He will be winched down, with or without a stretcher, and has to bring the survivor on board safely, often in difficult weather conditions and at night. Once on board, if necessary, survivors are treated by the flight nurse. The Merlin's range of up to 400 miles, double that of the Puma, has been a major factor in saving so many lives since it entered service. Several missions have been carried out as far away as 350 miles off shore. Lt Ricardo Nunes, a pilot-in-command on the EH101, said: "Long-range missions bring planning to a whole new level. Every small factor can influence the mission. For example, if the sea state is worse than expected it might take a couple more minutes to rescue someone from a ship. You can imagine how this adds up if we have to rescue ten or more people. So, in long-range SAR missions a good plan is essential. We often fly OEI [one engine inoperative] profiles in long-range missions because it can give us a 12% saving in fuel consumption. When someone's life is at risk, in the middle of the Atlantic at night in stormy weather,

Esquadra 751 EH101 Merlin variants

Variant	Regs	Role
EH101-514	19601-19606	SAR
EH101-515	19607-19608	SIFICAP
EH101-516	19609-19612	CSAR

it can make a difference!" Another pilot told AFM how wind affects the Merlin's range, more so than other aircraft, because of the helicopter's relatively low speed and non-streamlined design. On one occasion, he said, his crew undertook a long-range mission with a strong headwind – anticipating that on the way back the tailwind would take them easily back to solid ground.

However, the wind turned and they faced it again on the return flight. They made it back with just enough fuel, but it was a very close call. A typical SAR training mission lasts two and a half hours and sees a crew of four (usually without the flight nurse) fly out to the ocean looking for a random vessel willing to cooperate with their training. As a rule, the Merlin will position at 60ft (19m) above the vessel, moving sideways at exactly the same speed and direction as the ship. Depending on the requirement, either a dead weight or the rescue swimmer is winched down, with or without a stretcher and real-weight training dummy. Sometimes multiple systems operators or rescue swimmers undertake training on a single flight. Other types of training include tactical flying, instrument (IFR) and visual flight rules (VFR), navigation flights, exercises with force protection and special force units, general handling and emergency training.

Getting the call

A Monday morning, 0635hrs, and Esquadra 751's phone rings. A vessel carrying 24 people is sinking 170 miles off the coast of Cape Finisterre, Spain, north of Portugal. Ground personnel install an external fuel tank before "Rescue 23" takes off. Lt Nunes, the co-pilot on this mission, picks up the story as the helicopter approaches the ship after a 400 mile transit: "As we reached the area, the scene was like a Hollywood movie. The sea was very rough with waves up to seven metres. We found the ship turned upside down, with the bow slightly raised, and we could see almost the entire hull. The sailors were already in the water so there was no time to lose. We decided to go into the hover immediately and rescue three victims floating in line, clinging to a cable. Their anti-exposure suits were filled with water causing them to be in a state close to hypothermia. "In the meantime some others had been picked up by nearby ships. After rescuing two more sailors we decided initially to remain on station looking



Above: An EH101 flies over the Vasco da Gama Bridge which crosses the Tagus River, connecting Montijo to Lisbon. Menso van Westrhenen



Left: The squadron is involved in the annual Exercise Real Thaw held early in the year at Montijo Air Base. Paulo Mata

Au revoir Alouette?

When AFM visited Montijo several Alouette III, Super Lynx and Merlin pilots were evaluating the AgustaWestland AW109 as a multi-engine training helicopter before pilots convert to the Merlin. At present, rotary flying training is performed on the Alouette III and pilots describe the move to the EH101 as 'learning to fly all over again'. Portugal is among the worst-hit European economies and it will be difficult for the ministry of defence to find the money to fund the AW109 purchase.

for two more still missing but, after consulting rescue coordination and due to the status of the sailors already on board, we decided to head back to Santiago de Compostela, where we refuelled." The sailors were taken to hospital and the helicopter crew took a well-deserved break before returning to base later that afternoon. The total flight time was eight hours and 30 minutes. For the crew it was just another day living up to the squadron's motto 'So others may live'.

Right: A 'downed' pilot is picked up by a force protection team during a CSAR training flight. Dirk Jan de Ridder



Above: US Forward Air Controllers on board an FAP Merlin during Exercise Real Thaw 2012. Paulo Mata