The *Giuseppe Garibaldi* (C551) represents the Italian Navy worldwide with its embarked air component of Harrier II plus aircraft and various helicopters. Commissioned in 1985 – then world's smallest aircraft carrier – it has been involved in various allied operations over Somalia, Kosovo and Afghanistan.

Text and photos: Emiel Sloot

The C551, named after the 19th-century Italian soldier and patriot Giuseppe Garibaldi, was built by Fincantieri in Genoa and commissioned on July 31, 1985. With a maximum displacement of 31.7 million lb (14,360 m³), the *Garibaldi*’s main mission is to deploy as a mobile command and control centre in combination, with air defence and anti-surface as well as anti-submarine warfare systems. Furthermore, it can escort convoys, act as mobile maintenance centre for ship-based naval helicopters, transport troops and conduct disaster relief missions. Two AESN Albatros air defence systems with eight tube-launched radar-guided Aspide missiles each, in combination with three Dardo systems each controlling a Breda 40-mm twin-barrel cannon provide air defence against aircraft and missiles at medium to close range; its Harrier fighters form the first ring of defence. The flight deck, 571 ft (174 m) long and 98 ft (30 m) wide that ends in a six degrees ski jump, has seven landing spots for air operations although the most forward one, close to the ski jump, is only suitable for smaller helicopters such as the AB212. The hangar deck, stretching all along and underneath the flight deck, has a capacity of seven aircraft and features two elevators on the starboard side, just forward and aft of the bridge. In total, the *Garibaldi* can accommodate a maximum of 808 personnel.
Harrier II plus
The carrier’s air component generally is a mix of AV-8B+ Harrier II plus aircraft and SH-3D/H Sea King helicopters, the latter soon being replaced by EH101s. The mix ratio varies with the planned operation. For example, when on a humanitarian relief mission, only helicopter will be carried. When the carrier entered service with the Marina Militare Italiana (Italian Navy) in 1985, Italian law prohibited its navy to operate fixed-wing aircraft. Lifting of this ban in 1989 paved the way to acquire such aircraft.

Together with Spain and the United States, a project was started to develop the AV-8B+, an all-weather night attack version of the AV-8B that was already operated by the other two countries. The new version features the AN/APG-65 radar and a forward-looking infrared (FLIR) sensor mounted on top of the nose. To prepare the naval air arm for their new operations, two TAV-8B dual-seaters were acquired in 1991 to train crews, which were taken on charge by Gruppo Aerei Imbarcati (GRUPAER - Embarked Air Squadron) nicknamed Wolves, the newly established unit to operate the Harriers which is land-based at Grottaglie near Taranto. McDonnell flew the first AV-8B+ on September 22, 1992, and Italy bought 16. Three were built by McDonnell in St. Louis of which the first was handed over in April 1994. Subsequently, it was flown to MCAS Cherry Point by Commander Paolo Pitbull Treu, who later became commanding officer of GRUPAER during 1996-1997 and currently is captain of the Garibaldi as of September 27, 2004. The other two aircraft soon joined the first one for a test, evaluation and training programme before the Garibaldi picked up the aircraft in the USA in December 1994. Before that, US Marines Corps Harriers had been deployed to the Garibaldi on few occasions to test operations from the new carrier.

The remaining 13 AV-8B+ were assembled by Alenia, Turin of which the last one was delivered on November 25, 1997; one was lost in an accident at Grottaglie on March 4, 2002. While the USMC mainly operates the Harrier in the ground attack role, the Italian ones are multi-role with air defence for the carrier group as main task. For this, it can be armed with four AIM-120B AMRAAMs, four AIM-9L Sidewinders or a two/two mix of these. For close air support, it can carry the laser-guided GBU-12 and GBU-16 in combination with the Rafael / Northrop Grumman Litening II targeting pod that can also designate targets for other aircraft. Other armament options are the AGM-65E Maverick; Mk 82 and Mk 83 bombs; LAU-68 and LAU-69 pods containing seven or nineteen 2.75-in (70-mm) rockets; and a GAU-12/U 25-mm gun pod.

Shortly after the introduction of the Harrier II, the Garibaldi deployed to East Africa in 1995 to take part in Operation Somalia 3, with Commander Treu being one of eight operational AV-8 pilots on board. A major recent operation in which the carrier was involved was Enduring Freedom, when it was based in the Arabian Sea from December 2001 until March 2002, integrated into a US Navy squadron. Italian Harriers flew joint missions with US Navy and USMC units to Afghanistan, to an operations area located some 750 nm (1,389 km) from the carrier. Sorties that took up to 6.5 hours were supported by air refuelling. During several missions, Italian pilots received a go-ahead to attack specific targets, but in all cases the related missions were either over or cancelled before a bomb was dropped by the Harriers. However, GRUPAER conducted aerial reconnaissance with the help of their FLIR and Litening II pod. During operation Allied Force over Kosovo in 1999, Harriers have done actual bombing missions, and some of the aircraft still wear bomb markings referring to these occasions.

At the combat information centre (CIC), being the
operational heart of the ship's bridge from where all aerial, maritime and defensive operations are coordinated, MIDS (Multifunctional Information Distribution System) Link 16 terminals are located as part of this NATO broadband datalink system. Being the only Italian Navy unit equipped with this system, it is able to share info with other connected ships and aircraft such as AWACS. The Italian Harriers are however not (yet) equipped with Link 16.

Helicopters
For a variety of tasks including plane-guard missions during Harrier deck operations, transport, anti-ship and anti-submarine warfare, search and rescue, and medical evacuations, a number of SH-3D/H Sea Kings are detached to the Garibaldi. Helicopters and crews are supplied by the 3° Gruppo Elicotteri (3rd Helicopter Squadron) that is based at Catania-Fontanarossa, and the size of the detachment varies with the ship's mission. For carrier operations, the Sea King’s aircraft commander has to be qualified as such; this qualification includes ship-based day and night operations in both visual (VFR) and instrument flight rules (IFR) conditions, as well as winch operations.

Within the next few years, the Sea King will be replaced by the EH101. 22 of these three-engined helicopters equipped with a third-generation glass cockpit have been ordered for service with the Italian Navy, of which 10 in ASW-configuration, four as airborne early warning (AEW) platforms and eight tactical transport and support helicopters. Deliveries have started in March 2001, and to date all EH101s operate with the Nucleo Valutazioni Operative (operational evaluation unit) based at La Spezia-Luni. The EH101 has operated from the Garibaldi on several occasions recently, and currently the type-related carrier operations manual nears completion. It is expected that the EH101 will become fully operational as of early 2007.

Air Traffic Control
Regarding air traffic control, the Garibaldi is the centre of a CTR (control zone) with a 5-nm radius, in which air traffic including deck movements is controlled from the tower located on the bridge. A pool of pilots is responsible for this. Outside this CTR, air traffic to and from the carrier as well as other aircraft in the proximity are guided by dedicated approach controllers (with call-sign Ferrari Centre) located at the CIC (Combat Information Centre). The ship is equipped with a TACAN beacon as radio approach aid.

When a Harrier pilot approaches the ship, a virtual line parallel to the flight deck just on the port side is followed visually, with the help of TACAN or SRE (Surveillance Radar Equipment) if required. The glide slope is flown on the 'ball', a lighted reference system located on top of the bridge. When reaching a position just aft of the flight deck, still on the port side, the pilot manoeuvres his aircraft diagonally towards the allocated landing position on the deck with the help of the LUDS (line-up display system). It consists of a white reference light that has to be lined up with a green light. This leads to a hover position 40 feet over the deck, whereafter the vertical landing is carried out. For night landings, only one spot is available.

The flight deck has a two-metre wide centre line marked with lights, ending in a six-degrees ski jump. This start path is marked with digits every 50 feet to indicate the remaining take-off distance. Depending on the take-off weight, the take-off run is started
from one of these marked positions. Just before take-off, the deck crew checks the correct setting of the horizontal stabilizer as well as the correct functioning of the flaps and exhaust nozzles. After a thumbs-up signal from the deck officer, the pilot selects full throttle for the take-off run. When leaving the deck, a nozzle angle of fifty degrees is selected, which is necessary as the wings do not yet deliver enough lift with the current airspeed. As soon as the aircraft has accelerated to around 220 kt, depending upon weight, the nozzle angle is adjusted to zero degrees.

Training
Some of the new naval pilots receive their initial flight training with the Italian Air Force. Basic flying training is received with 70° Stormo at Latina on the SF-260EA, and graduates move on to Lecce for advanced flying training on the MB-339. However, most Italian Navy pilots join a training course with the United States Navy. With Training Air Wing 6 at NAS Pensacola, training is done ab-initio on the Beech T-34C Turbo Mentor. Following this phase, the group of graduates is split into future jet and helicopter pilots, depending on individual training results and specific needs. New Harrier pilots then move to NAS Meridian for training on the T-45C Goshawk with Training Air Wing 1. Part of the syllabus are initial deck qualifications, consisting of 10 landings and take-offs from an available US Navy carrier. Thereafter, the pilots join VMAT-203 Hawks at MCAS Cherry Point, the dedicated Harrier II type conversion unit with the US Marines Corps. The conversion course includes formation flying, the air-to-ground phase, night flying, a limited air-to-air phase and a single practice air refuelling sortie. After graduation, the pilot has a short stay with one of the operational squadrons at Cherry Point for familiarisation with certain weapon systems like the radar, as the TAV-8Bs of VMAT-203 lacks these. Then, the new Harrier pilots return to Italy for additional training with GRUPAER, including carrier qualifications (CQ) onboard the Garibaldi. At least eight landings and take-offs are part of this course, which are all rated by the landing signal officer (LSO), being an experienced Harrier pilot located on the Garibaldi bridge. Practising ‘hot refuelling’ on the flight deck is also part of the CQ. Finally, night carrier qualifications (NCQ) are carried out, both with and without the help of night vision goggles.
New carrier

Fincantieri is currently building a new carrier for the Italian Navy. The C552 Conte di Cavour, with a flight deck of 774 ft (236 m) by 128 ft (39 m) and a 12-degrees ski jump, is expected to be commissioned in 2008 and will be suitable for operations with the F-35B STOVL-version of the Joint Strike Fighter (JSF). Italy plays an active role in the JSF development but a firm order has yet to be made. Beside the F-35s, the Cavour could accommodate the EH101, NH90 NATO Frigate Helicopter (NFH) and the AV-8B+. Commissioning the Cavour to supplement the Garibaldi (and eventually replacement) will ensure the naval strike capacity for years to come.

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