



Dr Alix Valenti

Old Dog, New Tricks

Atlantique 2 Upgrades

“The backbone of surprise is fusing speed with secrecy,” according to Carl von Clausewitz, a Prussian general and military theorist. If this was true in the 18th century battlefield, it is all the more relevant for today’s theatres of operations.

Speed does not only contribute to defining the effectiveness of weapons, countermeasures, ships and land vehicles; it has also become a key discriminating factor of these systems’ and platforms’ ability to process information. Similarly, technological innovations regularly push back the limits of secrecy with the development of increasingly stealthy platforms.

In such fast-paced context, it would be easy to argue that the French Navy’s (*Marine Nationale* - MN) maritime patrol aircraft (MPA), the Atlantique 2 (ATL2), has largely become obsolete faced with progressively quieter submarines, ever more complex theatres of operations and faster missiles.

In reality, the nearly 30 years-old MPA continues to serve in a wide range of maritime and land missions, and the upgrade

it is currently undergoing will maintain it relevant for at least another ten years, through to the early 2030s when the new MPAs are scheduled to start replacing them. NAVAL FORCES flew with the squadron 21F to try and understand the key to the ATL2 success. And sound out its future within the MN.

Lesson in History

The history of the development of the ATL2 is as much of a history lesson as it is a lesson in history. Indeed, at a time when Europe is reigniting the debate on European defence cooperation, both at operational and industrial level, the ATL2 represents a much-needed successful example of such cooperation.

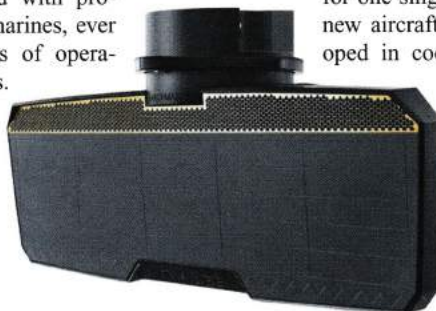
It emerged out of the necessity, in the 50s, for NATO countries to develop an MPA capable of tracking Russian nuclear-powered (SSN) submarines, which stealth posed an increasing threat to the alliance. Too expensive for one single country to develop, the new aircraft should have been developed in cooperation between different

countries under NATO’s MPA programme; however,

the US’, the UK’s and Canada’s decision to ultimately go a different route (Lockheed Martin’s P-3C for the US and the UK, and Lockheed Martin’s CP-140 for Canada) left France and Germany to cooperate together on the programme. In October 1958, the French Dassault Aviation Breguet 1150 was eventually chosen amongst many other proposals, and in October 1961 the SECBAT (European Company for the Construction of the Breguet Atlantic Aircraft) was founded. By the 1980s, four countries operated the Atlantic: France (40), Germany (20), the Netherlands (9) and Italy (18).

The MPA proved to be a success for the MN, in no small part thanks to its versatile nature. The Atlantic did not ‘only’ provide much needed protection for France’s submarine force, nor were its Intelligence, Surveillance and Reconnaissance (ISR) missions limited to seas and oceans. In its 25 years of service the aircraft also provided key support for French land operations in Africa guiding, when necessary, the strikes of the French Air Force’s (AA) Jaguar and Mirage F1.

As such, when time came for its replacement, France chose to develop the ATL2. Using the purposefully built Atlantic as a basis, Dassault



◁ Thales’ SEARCHMASTER radar will greatly enhance the ATL2’s capabilities for ISR missions. (Photo: Thales)

Of the 28 ATL2 of the MN, 18 are being upgraded and will return to the MN starting 2020 through to 2025. (Photo: MN)



the MPA can seek to determine its position by using sonobuoys, "an expandable electronic listening device dropped into water...[which] detects underwater sounds and transmits these sounds to the aircraft," the manual indicates.

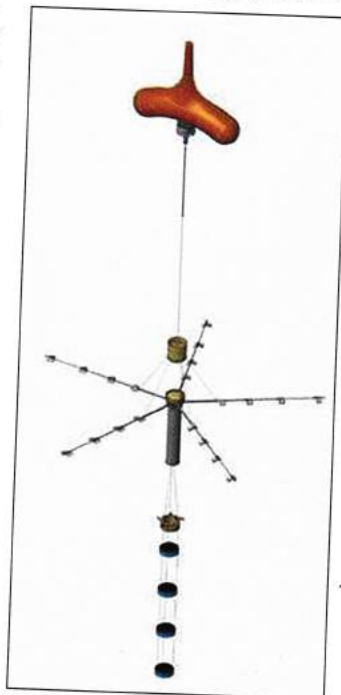
Today, the non-upgraded ATL2 is fitted with sonobuoys (a total of 3t can be carried on-board) that emit and receive; the information is then relayed back to the aircraft through analogue signal transmission via Thales' DSAX-1 Sadang, a data processing system associated with sonar buoys. "The problem with the current system is that the acoustic range we are able to detect remains limited, compared to the evolution of submarine stealth these past decades," Cdr Loy pointed out. As a result, this limits the ability of the aircraft to accurately pinpoint the submarine position underwater.

The renovated ATL2s will be fitted with two advanced systems that will give the MPA its advantage back against submarines. Firstly, the current sonobuoys will be replaced with Thales' Sono-Flash, a new product that Thales will present at this year's Euronaval exhibition in Paris. According to a Thales spokesperson, the Sono-Flash combines both active and passive capability, which will give the MN high flexibility with respect to the transmission patterns: rather than dropping both active and passive buoys in a pre-selected pattern around the target area (an exercise known as multi-statism that had the author turn white as a sheet from motion sickness during the simulation), the ATL2 will now be able to drop the Sono-Flash and then choose which buoys will be active and which will be passive. Through the same system, the depth of the buoys will also be modifiable. Thales indicated that the buoy, developed together with the French directorate for armament (DGA) and the MN, just completed the first stage of detailed design, which enabled the company to carry out

flight tests with the ATL2 and the NH90 for the past year until last June. It expects the buoy to be finalised in the next two to three years.

The buoys will then transmit the information digitally to the aircraft via Thales' latest generation digital acoustic processing subsystem (STAN). "This will significantly increase our observation frequency range, giving us back a crucial advantage over potentially hostile submarines," confirmed Cdr Loy.

◁ The upgraded ATL2 will carry Thales' Sono-Flash, a sonobuoy that will give the MN a greater level of flexibility in its ASW operations. (Photo: Thales)



modified them to carry the different parts of the new weapons system as well as more modern avionics. Originally scheduled to receive 42 ATL2 to replace the Atlantic fleet, the MN eventually only received 28 due to budgetary constraints affecting the programme in the 1980s. All were delivered by Dassault between 1989 and 1997.

Today, the Atlantique 2 is flown by the 21F and the 23F squadrons, both based in at the Lann-Bihoué NAS (Naval Air Station), in Brittany. The MPAs, powered by two turboprops built in cooperation with the UK's Rolls-Royce, France's Snecma and Belgium's FN (yet another example of successful European cooperation) have 18h of autonomy to ensure long patrols. They can also carry two AM 39 missiles or eight Mk46 or MU90 torpedoes, Anti-Submarine Warfare (ASW) grenades and, since 2008, laser guided GBU12 bombs. Eighteen of the 28 aircraft are currently undergoing an upgrade, which NAVAL FORCES discussed with Commander Charles Loy during the author's flight with a 21F crew last July.

Deterrence

"Deterrence is the ATL2's *raison d'être*," Cdr. Loy told NAVAL FORCES, "it is perhaps where we put most emphasis when we plan for upgrades." One of the MPAs' most important

missions is the protection of key capabilities. This includes escorting the MN's nuclear-powered ballistic missile-carrying (SSBN) 'Le Triomphant' class submarines out of their base at the Île Longue, as well as protecting the aircraft carrier and other important surface assets. Key to this mission is, first and foremost, the protection of these assets from other potentially threatening submarines.

To perform its ASW missions, the ATL2s are currently fitted with a Magnetic Anomaly Detector (MAD). According to the 'Airman' manual published in 2000 by the Naval Education and Training Professional Development and Technology Centre of the US Navy, a MAD system "uses the principle that a metallic submarine disturbs the magnetic lines of force of the earth." Hence, if an aircraft fitted with a MAD flies over a submarine, the system detects an anomaly in the earth's magnetic field. Upon detecting a possible hostile submarine,

ISR

Much like its predecessor, the ATL2 has been used extensively by the MN for joint operations, both in coastal areas and on land. Amongst some of the most notorious missions are *Opération Serval* (known as *Opération Barkhane* since 2014), covering five countries (Tchad, Niger, Mali, Mauritania and Burkina Faso) since 2013, and *Opération Chammal*, in Iraq since 2014. In both operations, the ATL2, not only provides key intelligence through ISR missions, but also coordinate joint action with ground troops and other coalition partners' striker jets. Key to the ATL2 success in these missions has been the introduction of L3's MX-20 WESCAM on the aircraft deployed to these theatres of operation.

"But today, only a limited number of ATL2s have this system," Cdr Loy noted, "so the fact that all 18 upgraded MPAs will be fitted with the WESCAM will largely contribute to increasing our capabilities." Indeed, non-upgraded ATL2 are only fitted with a Forward Looking Infrared Radar (FLIR) system, which provides thermal imaging, night vision and infrared images that can then be transmitted to flight crews and/or land troops. The quality of the images, while good, does not however match that produced by the WESCAM. The addition of the system allows ATL2 tactical officers to benefit from features such as multi-sensor imaging (HD imaging resolution from electro-optical (EO) and IR cameras), real-time image enhancement for EO day, EO night and IR, and an IMU & MX-GEO software suite, which all contribute to producing highly accurate target location. Combined with the increasingly precise weapons used for the strikes, these capabilities turn the ATL2 into a crucial support for very precise target detection, identification and strike. "The added advantage of the ATL2, in addition to all

this technology, is the presence of a photo interpreter onboard who will be able to confirm if what we suspect we are seeing is correct," added Cdr Loy. This is possible thanks to the window placed on the nose of the aircraft, below the cockpit, where the photographer has a panoramic overview of the situation.

The other new system that will greatly enhance the ATL2's ability to provide support to air force and land army missions will be the integration of Thales' SEARCHMASTER radar, which will replace the current Iguane. The new radar uses X-band Active Electronically Scanned Array technology, which offers the capability to follow the mission evolution, while its generic hardware design, built on the experience of generations of fighter and maritime surveillance radar, is software defined and allows ample room for growth. This is key, as currently the contract signed with the MN does not include two key ground surveillance and mapping features, namely the Synthetic Aperture Radar (SAR) and the Ground Moving Target Indicator (GMTI). The former would enable ATL2 operators to build a 3 dimensional image of the situation for improved situational awareness, while the latter would significantly improve the MPA's ability to track moving targets, whether on land or at sea.

"Today we work less in operational theatres with clearly marked enemy lines," Cdr Loy told NAVAL FORCES, "dealing instead more often with small groups of people whose fighting methods are more akin to those of guerilla fighters." This translates into a need for an increasing amount of information, coming from multiple sources, which then needs to be processed and restituted in the simplest possible way in order to facilitate speedy yet very precise decision-making. Enhanced capabilities in this sense will be brought on by Naval

Group's upgrade of its LOTI combat system (*Logiciel de Traitement de l'Information* - Information processing system). The upgraded system will allow for simultaneous use by multiple operators.

All these improvements will also, of course, greatly contribute to other MPA missions such as search and rescue missions, traffic surveillance and maritime violations, which the ATL2 carries out in support to the MN's Falcon 50.

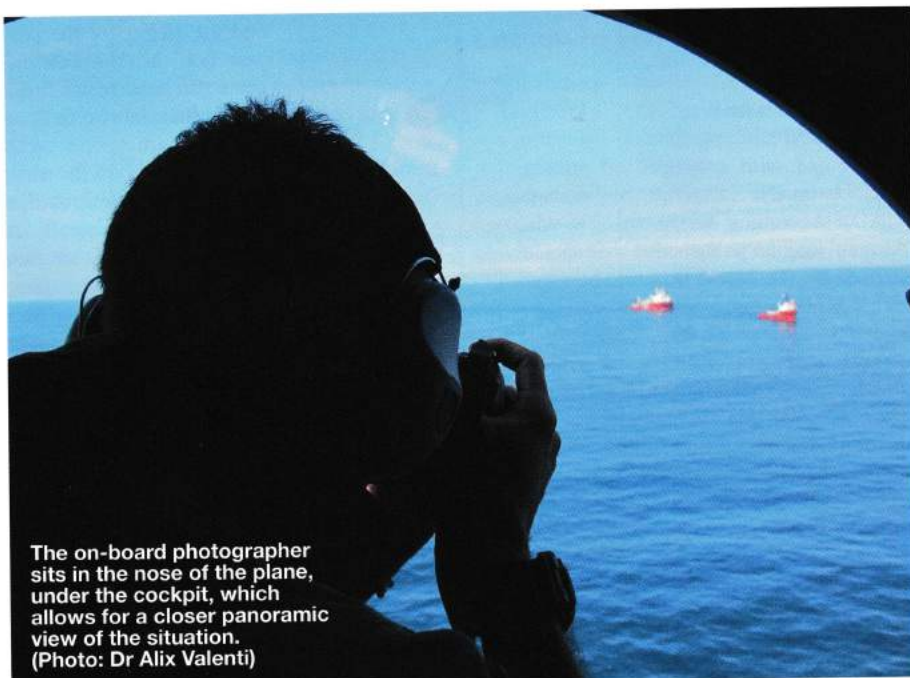
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At a time when other nations around the world are purchasing new MPAs, such as the US, the UK and Australia, which have all chosen Lockheed Martin's P-8, one might wonder why France is instead choosing to upgrade its ATL2. The rationale behind such choice is, most likely, two-fold. Firstly, the ATL2 is one of the very few purpose-built MPAs in service together with Japan's P-1; all others have been adapted from successful commercial designs. This has greatly contributed to making the ATL2 a strong asset for the MN, a success that its latest missions accurately reflect.

Secondly, as relations with the US become increasingly uncertain, France, like other NATO nations, is looking to move away from its dependence from Uncle Sam for military supplies. This is reflected in the selection of Thales' Sono-Flash over the US sonobuoys that had thus far been procured from Sparton, but also in the choice to work on a programme together with Germany on the development of a common MPA. To this end, a letter of intent was signed between the two defence ministers this past May for the Maritime Airborne Warfare System (MAWS) programme, which should ensure the replacement of the aircraft starting in the early 2030s. If the decision to retain sovereignty over the capability development is maintained, this would rule out the Japanese P-1 and the American P-8, favouring European companies such as Airbus; recent discussions, however, have revealed that it may prove costly to modify some of Airbus' aircraft as an MPA.

Questions may also arise in relation to the relevance of ATL2s in light of the growing use of Unmanned Aerial Vehicles (UAV). In reality, though, while UAVs can certainly prove to be strategic assets for simple ISR missions (they have already shared the workload with the ATL2 during *Opération Barkhane*), a number of limitations remain. "First of all, currently, no UAVs could carry all the ISR sensors, sonobuoys and weapons an ATL2 can carry," Cdr Loy told NAVAL FORCES. "Of course, part of ATL2's ISR missions on land may appear very similar to some UAV missions, but similarities are limited. In ASW, ASuW, SAR, counter terrorism missions or when acting to coordinate other air assets, things are widely different. Direct sight, crew analysis and environment awareness are then essential," he concluded.

NAFO



The on-board photographer sits in the nose of the plane, under the cockpit, which allows for a closer panoramic view of the situation. (Photo: Dr Alix Valenti)