2015 Paris Air Show: Sagem showcases high-value-added innovations for civil and military air operations

At the 51st Paris Air Show, Sagem (Safran) is focusing on innovations and high-value-added services for all of its civil and military aviation customers. Sagem is showcasing its offering on the Safran stand, organized in several major areas: onboard optronic systems, manned and unmanned aerial surveillance, precision weapon guidance, flight control, critical cockpit electronics.

Sagem products and services on display at the Paris Air Show include the following:

**Patroller™ tactical drone.** A high-performance tactical drone, the Patroller handles enriched multi-sensor intelligence, guidance of ground support operations, and military protection and homeland security missions. The Patroller system's performance has been enhanced through the integration of innovative functions on both the airborne platform and ground segment, including mission planning modules, very-high-resolution optronic sensors, and a portable RVT (Remote Video Terminal) for transmission of images and high-speed data to the ground. The Patroller also features technologies enabling it to be integrated in civil airspace. Developed in France by Sagem, the Patroller carries a multi-sensor payload up to 250 kg, and offers endurance exceeding 20 hours at speeds of 100 to 200 km/h.

**Sagem AASM Hammer deployed on C-130 Hercules transport using the Gerfaut system.** Sagem continues to extend the operability of the AASM Hammer modular air-to-ground weapon. As prime contractor for the AASM missile, Sagem is teaming up with Rafaut and AA/ROK on the SSA-1101 Gerfaut system, designed to integrate the AASM on the C-130 Hercules transport, without any changes to the airframe. Deploying AASM missiles, the C-130 provides persistent zone coverage, and can carry out targeted high-precision strikes from a range of several dozen kilometers. Sagem's AASM Hammer is in service with the French army and navy, and is combat proven in Rafale deployments, contributing to successful French missions in different theaters of operation.

**Euroflir, a family of optronic systems.** Sagem is showcasing its Euroflir range of gyrostabilized Euroflir optronic systems for airplanes, helicopters, balloons and drones. Several different sensor configurations are available to meet diversified observation and intelligence requirements: infrared and TV cameras with very high resolution and progressive zoom, spotters and laser pointers, designators and illuminators.

The Euroflir 350 is being displayed on the Safran stand along with its operating console. It also equips the A-NSE captive balloon and the Diamond DA 42 aircraft seen on the Défense Conseil International (DCI) stand. The Euroflir 410 can also be seen on the Patroller drone. The Euroflir is connected to a flight simulator on partner Vodea's stand, and its digital mapping function is connected to recorders. Euroflir systems are in production for helicopters deployed by the French army, navy and special forces.

**New-generation navigation systems.** Sagem is developing new types of inertial sensors to meet growing demand for reduced costs. Used on tomorrow's navigation systems, these sensors call on several revolutionary technologies: HRG (hemispherical resonator gyro) and MEMS (micro-electromechanical systems). With this new generation of inertial sensors, Sagem can offer navigation systems combining very high reliability, small size and lower total cost of ownership.

**New-generation active side stick unit.** For the first time at the Paris Air Show, Sagem is showing its prototype active side stick unit in a next-generation cockpit, intended for the flight control of both civil airplanes and helicopters. Incorporating a number of Sagem's patented innovations, this new active side stick unit features very high reliability, robustness in standing up to all contingencies, and an optimized architecture to adjust force feedback in real time. The synchronization of these units and a stick shaker function greatly facilitates pilot-copilot coordination and the management of stressful situations.
**Fadec and other engine control units.** Fadec 4, the fourth generation of Sagem's full authority digital engine control, is on display at the Air Show. It has been selected for the new LEAP engine from CFM International (the 50/50 joint company between Snecma and GE) for the A320neo, Comac C919 and Boeing 737 MAX, and the GE Passport 20 which will power the Global Express 7000 and 8000 bizjets. The Fadec 4 features a distributed architecture to optimize integration in the engine nacelle. In addition to fuel control, it also adds vibration detection and health monitoring functions. The Fadec 4 is developed by Fadec International (a 50/50 joint company between Sagem and BAE Systems) through Fadec Alliance, a joint venture with GE. Sagem is also showing the engine control unit for the Silvercrest engine that will power Dassault Aviation's new Falcon 5X bizjet.

**Cassiopée.** Sagem developed its Cassiopée range of flight data analysis services to meet the needs of airlines and helicopter or business jet operators, by maximizing the use of this data. Cassiopée expanded its service offering in 2015, including innovative data solutions. Cassiopée analyzes current operational scenarios and provides innovative services based on connected aircraft, in line with future operational scenarios, while also generated added value for customers. Sagem is introducing a new service, an electronic flight report, which means time savings for the operator, along with greater dependability and more secure sign-offs on flight reports. The Safran stand features a Cassiopée demonstration.

Sagem contributes to most of today's most innovative civil and military aircraft, including the Dassault Aviation Rafale and Falcon 5X, Airbus A320neo, A380, A350, ATR600, A400M, Caracal and Tiger, the NHI NH90 helicopter, Embraer KC-390, ARJ21 Xiangfeng from Comac and China's planned MA700 regional transport.

**Sagem is showcasing its products and expertise on the Safran stand (Hall 2A).** The Patroller drone system and its ground segment are on display in the static exhibition area (B4).