

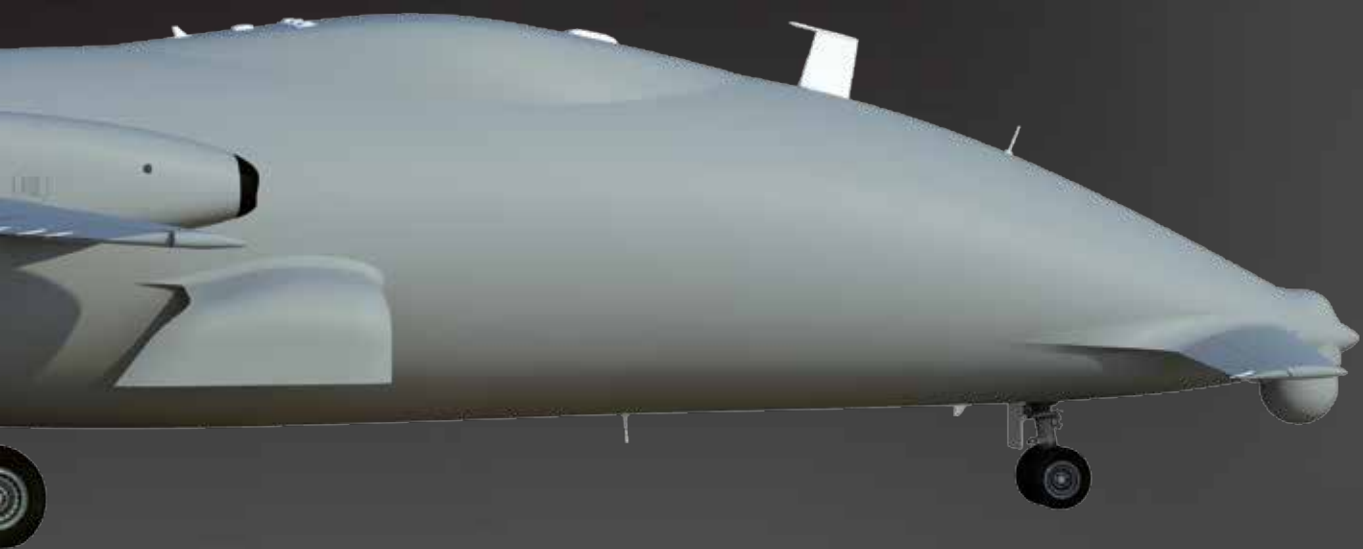
P.1HH HAMMERHEAD





P.1HH

HAMMERHEAD



**MEDIUM ALTITUDE LONG ENDURANCE
ISR UNMANNED AERIAL SYSTEM**

DIMENSIONS

Span	15.600 m	[51.18 ft]
Length	14.408 m	[47.27 ft]
Height	3.980 m	[13.05 ft]

AREAS

Wing	18.00 m ²	[193.75 ft ²]
Horizontal Tail	3.834 m ²	[41.27 ft ²]
Vertical Tail	4.731 m ²	[50.92 ft ²]
Forward Wing (Exposed)	1.300 m ²	[13.99 ft ²]

WEIGHTS

Max TakeOff Weight MTOW	6,146 Kg	[13,550 lbs.]
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POWERPLANT

2 × Pratt & Whitney Canada PT6A-66B 850 SHP
(ISA, sea level)

Hartzell five blade low noise propellers counter rotating.

PERFORMANCE

Maximum speed:	395 KTAS
Cruise speed:	320 KTAS
Loiter speed:	135 KTAS
Max Range:	4,400 NM
Max Endurance (500 lbs payload):	16 hours
Endurance (500 lbs payload) @ 1,500 km from takeoff & landing base	10.5 hours
Service ceiling:	45,000 ft

Mission system Selex ES SkyISTAR® with:
FLIR EO/IR StarSafire 380HD
Seaspray 7300 E Radar

PIAGGIO AEROSPACE P.111H HAMMERHEAD UAS

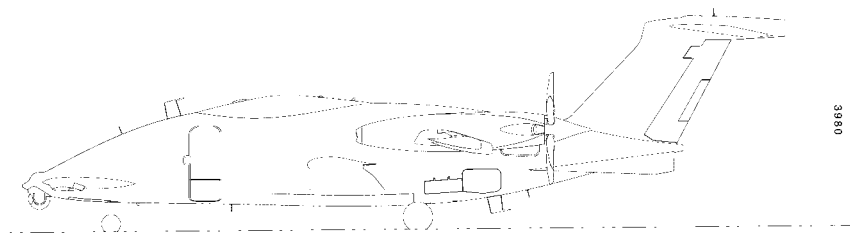
Capable to perform
ISR – COMINT - ELINT – SIGINT missions

All weather operation
Automatic takeoff & landing

Compliant with STANAG-USAR 4671

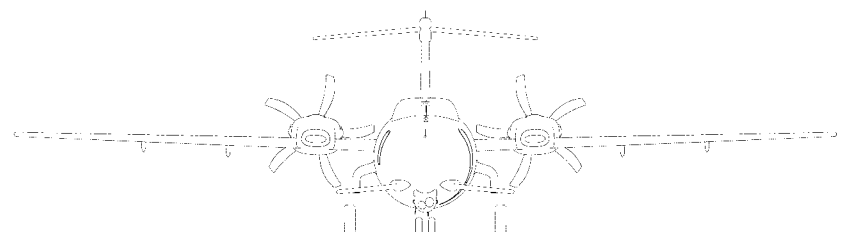
Full redundancy – Safety requirements
Cat. Event Prob. 10-6 FH, SW Critical
functions DO178B level B

System is ground/sea/air transportable
(removable wings)
24 hrs deployment capability



14408

15533



3380

THE PIAGGIO AEROSPACE P.1HH HAMMERHEAD UNMANNED AERIAL SYSTEM

THE P.1HH HAMMERHEAD UAS

The Piaggio Aerospace P.1HH HammerHead is a new, state-of-the-art Unmanned Aerial System (UAS) designed for Intelligence, Surveillance and Reconnaissance (ISR) missions whose combination of performance and operational characteristics is at the very top end of the UAS MALE category.

An unmatched combination of range, wide operative speeds, fast climb gradient, high operative ceiling and variety of payloads, provides end-users with a powerful yet flexible Defense System that outperforms other MALE Systems, identifying the P.1HH HammerHead as a Super MALE UAS.

P.1HH HammerHead, is suited for a wide range of ISR, Defense and Security missions, and defines an unsurpassed mission role flexibility and sets a new frontier of CONcept of OPerationS (CONOPS) for Defense.

The P.1HH HammerHead Unmanned Aerial Vehicle (UAV) is derived from the successful Piaggio Aerospace P.180 Avanti II business aviation aircraft, the fastest twin turboprop aircraft in the world with a proven, uneventful, service record of more than 20 years and 800.000 flight hours.

The design of the P.1HH HammerHead aims at being a unique ISR platform, able to climb up to 45.000 feet, loitering quietly at low speed (135 KTAS) for an endurance of up to 16 flight hours and dashing at very high speed (up to 395 KTAS) to target. Its capabilities include being able to host several payload combinations and to perform multiple missions: aerial, land, coastal, maritime and offshore security, COMINT/ELINT, electronic warfare as well as other roles.

Based on the P.180 Avanti II proven architecture and technologies (tested and certified for passenger transportation) and, on the outstanding experience and capability of Selex ES in the mission management systems for manned/ unmaned ISR, P.1HH HammerHead is designed to be an all weather aircraft with twin turboprop propulsion providing maximum safety, operational reliability and the lowest incident rate in its category. The P.1HH HammerHead design is fully compliant with STANAG USAR 4671 standards to fly in both restricted and unrestricted flight areas, according to the relevant authorities permission.

P.1HH HAMMERHEAD THE UAV PLATFORM

The P.1HH HammerHead UAV platform has an aerodynamic configuration largely similar to P.180 Avanti II. This is very versatile thanks to its unique patented 3 lifting surfaces configuration (3 LSC) and high aspect ratio laminar wings, adapted for the P.1HH design by moderately increasing the wing span to sustain larger vehicle masses and allocating a quick detachable joint to the outer wings for rapid aerial deployment of the UAS in remote areas. Being based on a certified Mach 0.70 aircraft, P.1HH HammerHead is the fastest MALE.

The P.1HH HammerHead power plant has two, highly reliable Pratt & Whitney Canada PT6A-66B turbine engines integrated with low noise 5 blade scimitar propellers. The Power Plant is controlled by two Engine Interface Units that receive commands from the FCC to drive the turbine and the propeller governors while managing engine and propeller data. A large upper fuselage tank, supported by a robust yet efficient carry through beam, is integrated to provide the required fuel quantity for long range and endurance.

A smart fuel system is designed to control and minimize the movement of the aircraft center of gravity for

P.1HH HAMMERHEAD

maximum operational flexibility in a wide range of mission payloads. The triple redundant 28VDC electrical generation and distribution system supplies energy for all aircraft functions with adequate operational reserve through the envelope, and fully satisfies large power demands from a variety of power consuming payloads. P.IHH HammerHead inherits proven Piaggio Aerospace P.180 aircraft general systems, e.g.: Anti Ice, with hot air on main wing, electrical on forward wing and pneumatic boots on the engine nacelle inlet. It also has a hydraulic dual pressure system for landing gear extensions/retraction and brake activation, plus other ancillary systems like fire extinguishing for the engine nacelle area. These subsystems are all commanded by the VCMS, via fail-safe Remote Interface Units.

P.IHH HAMMERHEAD PAYLOAD ARRANGEMENT

The large but, low drag P.180 aircraft fuselage provides capability for aerodynamically effective payload arrangements, with plenty of available volume from the variety of LRU's equipment, sensors and communication equipment comfortably located inside the fuselage:

P.IHH HAMMERHEAD VCMS THE UAV BRAIN

P.IHH HammerHead features a technologically advanced Vehicle Control & Management System (VCMS) that when combined with the advanced Mission Management System (MMS) manages the UAV and its mission specific equipment.

The VCMS, commanded from the Ground Control Station (GCS) via an airborne datalink system, conducts the vehicle commanding aerodynamic control surfaces and manages on-board equipment with a triple redundant Flight Control Computer (FCC) system and multiple remote multi-lane Servo Interface Units (SIU), developed to achieve the required level of safety and mission reliability.

Position, attitude and air data are guaranteed by triple redundant Inertial Sensors (INS) and Air Data Probes (ADS), mounted in the VCMS.

P.IHH HammerHead VCMS features an Automatic Take-Off and Landing (ATOL) system served with dual redundant external sensors for required reliability and safety.

All VCMS LRU's are installed inside the large volume fuselage, in a very protected optimized operative environment, in a specific lay-out that provides zonal separation and temperature analysis to achieve a state of the art operative temperature range, highest VCMS reliability and finally, P.IHH HammerHead safety. Very easy access is provided through the large entry door and a multitude of access doors for the best maintainability within the segment.

P.IHH HAMMERHEAD GROUND CONTROL STATION & DATALINK SYSTEM

An advanced Ground Control Station (GCS) is the P.IHH HammerHead UAS's command & control center.

The GCS is located in an autonomous shelter that hosts crew, equipment and consoles necessary to manage three UAVs (two operational, one in transfer mode) and their related Payloads.

The Crew processes functions necessary to execute tactical unmanned missions and stand-off surveillance unmanned missions, remotely commanding and controlling through VCMS and MMS the on-board surveillance system with an advanced human/machine interface integrating display and control system.

The GCS is provided with multiple Ground Data Terminals (GDT) that when coupled with the associated Air Data Terminals (ADT) on the vehicles provide Line Of Sight (LOS) and Beyond Line Of Sight (BLOS) Link for Vehicle and Payload Control.

The Links System allows LOS & BLOS air vehicle command & control and payload digital encrypted data transmission via redundant, multi-frequency, high bandwidth RF links and via Ku/Ka Band SATCOM.

Mission data is eventually relayed to the headquarters either via ground communication systems or eventually with the same LOS/BLOS data link.

VCMS / GCS is developed and supplied by Selex ES thanks to their long experience in Avionics for many different platforms and Unmanned Aerial Systems.

P1HH HAMMERHEAD MISSION MANAGEMENT SYSTEM

The P.1HH HammerHead UAS Mission Management System is based on Selex ES skySTAR® innovative technology, which redefines the concept of patrolling and ISR missions, to encompass threats that range from terrorist attacks to illegal immigration, as well as protection of Exclusive Economic Zones (EEZ), infrastructures and critical sites.

The on board airborne Mission Management System (MMS) manages sensors, video and data, communications, and ISR functions and it is capable of recording video and mission data.

The MMS is modular and reconfigurable with effective and fully integrated open system architecture possessing significant growth capability.

Sensor fusion technology, data management and exploitation features of skySTAR® enable highly effective border control, wide area surveillance, targeted surveillance environmental and disaster control missions.



P.1HH HAMMERHEAD MALE ISR UNMANNED AERIAL SYSTEM MAIN COMPETITIVE CHARACTERISTICS

Twin turboprop, all weather, proven system architecture and technologies

Unpaired combination of performances for range and operational speed:

- Operational Ceiling: 45,000 ft.
- MMO: 0.70 Mach
- Climb to 35,000 ft. in 20 minutes at maximum weight
- Loiter at 135KTAS (1 to 3 NM turning radius).
- Maximum speed up to 395 KTAS
- Endurance: 16 hrs plus, with ISR payload
- Range: up to 4,400 NM

Vehicle Control Management System compliant with STANAG USAR 4671 standards with Automatic Take Off and Landing

LOS/BLOS wide/narrow band Datalink

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