**Airborne Surveillance Platform**

From Wikipedia, the free encyclopedia

|  |
| --- |
| **Airborne Surveillance Platform** |
|  |
| ASP Airavat during the tests in 1996 |

The **Airborne Surveillance Platform (ASP)** is an [Indian](http://en.wikipedia.org/wiki/India) defense project, initiated by the [Defense Research and Development Organization](http://en.wikipedia.org/wiki/Defence_Research_and_Development_Organization), which aimed to produce an [Airborne Early Warning](http://en.wikipedia.org/wiki/Airborne_Early_Warning) System. Two prototypes were developed and flight tested for three years. The project was cancelled in 1999 after the prototype aircraft crashed, killing 8 scientists and aircrew. After four years of inactivity, the project was revived in 2004 with a new platform and radar.

**Origins**

The ASP program, code-named "Airavat", is one of the key force multipliers in the modern war scenario. India's [Defense Research and Development Organization](http://en.wikipedia.org/wiki/Defence_Research_and_Development_Organisation) (DRDO) is developing an advanced surveillance platform based on an [Hawker Siddeley HS 748](http://en.wikipedia.org/wiki/Hawker_Siddeley_HS_748) aircraft to detect targets at extended ranges with all round azimuth coverage. It is designed to handle 50 targets. It features a Hybrid navigation system, including both satellite and ground (beacon) based topography. The communication and data links are dual redundant secure systems.

The origin of the program possibly lies in the aftermath of the 1971 Indo-Pak war. As witnessed by the air-operation in the western front, timely information and coordination, namely vectoring and interception cannot be done effectively from the ground. In the late 1979, the DRDO formed a team to study the possibility of mounting an airborne radar on an existing aircraft.

The problem was not the availability of suitable aircraft but the fact that India did not process an effective airborne radar. An ad hoc team of specialists from LRDE began their work on developing an Airborne Radar, which in itself is a key "Enabling Technology" for the final product.

Studies and analysis began in July 1985 under project name 'Guardian', later (Possibly in 1987) renamed 'Airawat'. By the late 1980s an HS 748 had been modified with a 24 ft x 5 ft composite rotodome. The aircraft flew with a pylon (without the dome) in May 1989 and with the rotodome in November 1990. The Centre for Airborne Systems ([CABS](http://en.wikipedia.org/wiki/CABS)) was set up in February 1991, under Dr K. Ramchand to act as a system house and integration agency using all the expertise and infrastructure available in India. At the peak of its operations, some 300 Scientists and Engineers were employed/reported by/to CABS. The project received public recognition when the aircraft was flown during the flight demonstrations at the inauguration ceremony of the first Aero India show held in Bangalore in December 1996.

There were two testbeds employed in design program, with tail nose: H-2175 & H-2176; they were transferred from the IAF's western command.

**SP Antenna & Rotodome**

A low side-lobe slotted wave guide planar array is designed to act as the Antenna. The antenna featured very low side lobe levels and a narrow beam width in azimuth. It handles high power (better than 3.3 KW average) and weighs just 160 kgs. For housing the primary and the secondary (IFF) antennas, an ellipsoidal structured (7.315 m x 1.524 m) rotodome was fabricated. It largely comprises composites ( a real luxury to designers in that time) and aluminum alloy parts. The rotodome has since been successfully fabricated and flight tested on the ASP system. The rotodome is driven by a hydraulic servo system using aircraft.

**Airborne Data Processor**

The airborne radar data processor (ARDP), supporting TWS ([track-while-scan](http://en.wikipedia.org/wiki/Track-while-scan)), is required to form target tracks after receiving data from the various sensors of ASP, such as the primary radar (PR) and the secondary surveillance radar (SSR), which operate in TWS mode. The ARDP is required to correlate the target plots from scan to scan to maintain the target tracks. It also needs to perform the correlation of target information obtained from SSR and endorsement with the PR track information. In May 1997, all the requirements have been met and the system is delivered o CABS for integration.

**Integrated Navigation System**

The ASP is guided by a high accuracy navigation system, which consists of an inertial navigation system (INS) and a Doppler navigation system. The velocity drifts of INS are contained by Doppler velocities using a [Kalman filter](http://en.wikipedia.org/wiki/Kalman_filter), resulting in good navigation accuracy required for long endurance missions of ASP. Presently, Work is in hand to integrate [GPS](http://en.wikipedia.org/wiki/GPS)/[GLONASS](http://en.wikipedia.org/wiki/GLONASS) receivers with INS to enhance performance, reliability and robustness.

**Integration, trials & crash**

System integration had begun in the late 1980s and by 1989 HAL had modified 3 HS 748 airplanes with pylons as well as an additional APU to power the rotodome hydraulics, computers, communications and the experimental gear aboard. the trials began in 1989. When the fully integrated (with all subsystems and Rotodome) craft flew for the first time in November 1990, it was indeed a job well done by CABS and all participating bodies.

The trials lasted for approximately 3 years when the ARDPs had to be replaced with newer variants and the trials were grounded for that time. In 1995 when the tests commenced again, most of what been expected of the platform had been realized. The radar and the antenna had been tweaked and hope was running high. However, at the same time the Air HQ staff re-affirmed their previous doubts about the specifications meeting the Air HQ requirements.

This led to controversy and the Defense Ministry had to step in to avert any further loss of face and, reportedly, the ministry affirmed to the Air HQ & Air Force that the ASP was not meant to meet the requirements of the forces, but rather to explore the possibilities of an airborne EW platform (with the only viable platform being the HS 748.)

Though observers point to these differences as the reasons contributing to the handing over of the ASP to the [Indian Navy](http://en.wikipedia.org/wiki/Indian_Navy) rather than the IAF, it should be observed that both the Indian Navy and Air Force did define the requirements.

After this clarification, the project progressed with renewed vigor, only to be set-back for a long time when, on 12 January 1999, the second prototype crashed (the first one being just a test-bed for the pylon studies). Everyone on board the aircraft died in the crash, a total of eight people (two crew, four scientists and two IAF engineers.)

**Controversy**

**CABS**

The Defense Ministry set up a dedicated laboratory, namely [CABS](http://en.wikipedia.org/wiki/CABS) (Centre for Airborne Systems) in February 1991 for progressing the technologies and sub-systems necessary for the ASP. The main task allotted to the CABS was design, development, integration and evaluation of airborne electronic systems on a suitably modified flying platform for surveillance of airspace together with command and control functions besides transfer of appropriate technologies to industry. Besides CABS, LRDE, Gas Turbine Research

**Strategy and Execution**

The strategy adopted by CABS involved the development of an ASP using rotodomed HS 748 aircraft as the flight test bed, in the first phase for the development of the indigenous Airborne Early Warning technology to be evolved on a step by step, modular, low cost and low risk approach.

**Platform**

Though the selection of this particular platform has drawn much heat from many quarters, there really was no alternate platform available with India then. Particularly, this was an issue because the Indian Airlines had recently (in 1989) phased out the HS 748 completely, citing passenger safety. Though the IAF continued to operate them in logistics role, the top-brass certainly did not want it to be the platform for an AEW aircraft.

**Air HQ's statements**

In October 1992,the air HQ while commenting on the system specification document stated, that while the specifications were meant for ASP and is not expected to meet the Air Staff Requirements at that stage. Also the statement expected that the design philosophy was targeted towards meeting the Air Staff Requirements at a later stage. The Ministry stated, in February 1999, that ASP was not meant to meet the requirements of users but to induct and demonstrate the technology by utilizing the only viable platform. The fact, however, remains that the ASP development program was taken up as a first step towards the development of full-fledged AWACS, the need for which was projected

**Closure**

Following the 1999 crash, the ASP program had been pushed back for about 3 years. But due to the differences in opinion and chiefly due to the reported unreliability of the HS 748 platform, the project had been shelved.

**Revival**

Main article: [DRDO AEW & C](http://en.wikipedia.org/wiki/DRDO_AEW_%26_C)

However, by mid-2002 the project was "re-activated" , according to various news reports. As of March 2007, CABS was working on developing another indigenous airborne early warning (AEW) system. According to the Defense Minister, completion of development activities and commencement of user trials should occur in 2012. The platform selected this time is [Brazilian](http://en.wikipedia.org/wiki/Brazil) [Embraer](http://en.wikipedia.org/wiki/Embraer) with CABS AESA Radar.

The new system will be based on the [Embraer](http://en.wikipedia.org/wiki/Embraer) [EMB-145](http://en.wikipedia.org/wiki/EMB-145) aircraft and an active phased array radar. IAF and army propose to use this mini-AWACs systems as a compliment to the larger AWACS system being imported from Israel. The Union Cabinet has already given a green signal to the development of such an aircraft-based system.

Goals of the AEW & C Program:

* [AEW](http://en.wikipedia.org/wiki/AEW)
* Nodal [AWACS](http://en.wikipedia.org/wiki/Airborne_Early_Warning_and_Control) function(s) in the National Grid (functioning in tandem with Phalcon)
* [Comint](http://en.wikipedia.org/w/index.php?title=Comint&action=edit&redlink=1) capabilities.
* [Sigint](http://en.wikipedia.org/wiki/Sigint) capabilities.
* [IFR](http://en.wikipedia.org/wiki/IFR) capabilities.

Functions/features

* Asynchronous/Synchronous Datalink between 40 aircraft.[[6]](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_note-5#cite_note-5)
* Hybrid [Inertial](http://en.wikipedia.org/wiki/Inertial)/[Satellite Navigation](http://en.wikipedia.org/wiki/Satellite_navigation) System.
* Integrated [IFF](http://en.wikipedia.org/wiki/IFF) with mode-4 capability.
* Multiple Redundant Air to Air datalinks.
* Multiple Redundant Air to ground datalinks.
* Satcomm Links.

**References**

1. [**^**](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_ref-0#cite_ref-0) [a](http://www.drdo.org/pub/techfocus/dec98/avionic.htm)
2. [**^**](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_ref-1#cite_ref-1) hydraulic power
3. [**^**](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_ref-2#cite_ref-2) [The Hindu : National : Cabinet panel nod for `Airawat' project](http://www.hinduonnet.com/2004/09/10/stories/2004091004881100.htm)
4. [**^**](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_ref-3#cite_ref-3) [Airborne surveillance platform (ASP)](http://www.globalsecurity.org/military/world/india/asp.htm)
5. [**^**](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_ref-4#cite_ref-4) [outlookindia.com | wired](http://www.outlookindia.com/pti_news.asp?id=544197)
6. [**^**](http://en.wikipedia.org/wiki/Airborne_Surveillance_Platform#cite_ref-5#cite_ref-5) [India's flying Testbeds](http://www.acig.org/artman/publish/article_533.shtml)

**External links**

* [Surveillance Platform DRDO Technology Focus report on ASP](http://www.drdo.org/pub/techfocus/dec98/avionic.htm#Airborne)
* [Airborne Surveillance Platform](http://www.globalsecurity.org/military/world/india/asp.htm) on [GlobalSecurity.org](http://en.wikipedia.org/wiki/GlobalSecurity.org)