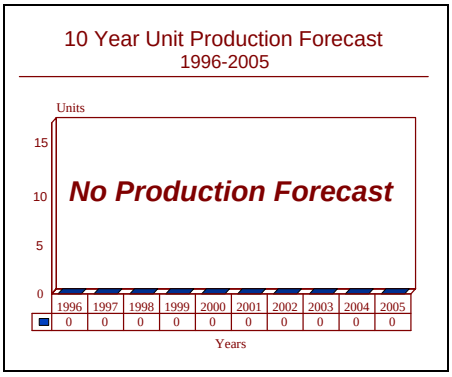
ATLIS II - Archived 10/97

Outlook

- Inexpensive alternative to the US LANTIRN
- No further sales are expected other than spares



Orientation

Description. Automatic Tracking Laser Illumination System (ATLIS) is a pod-mounted fire-control system.

Sponsor
Ministry of Defense
14 Rue St. Dominique
F-75997
Paris Armees
France
Tel: +33 1 45 55 95 20

Contractors
Thomson-CSF
Division Equipements Avioniques
178, bd Gabriel-Peri
92240 Malakoff Cedex
France
Tel: +46 55 44 22
(System design and production)

CILAS
Compagnie Industrielle des Lasers
Route de Nozay
PO Box 27
F-19460 Marcoussis
France
Tel: +33 1 64 54 48 00
(Laser designator/receiver production)

Status. In production.

Total Produced. Thomson-CSF has sold approximately 160 pods.

Application. In use on French Air Force Jaguars, exported for use on F-16 and Mirage 2000. Can also be used on the F-15, F-5, Tornado, Aermacchi AMX, F-18, A-7, and F-4.

Price Range. Unspecified.

Technical Data

Characteristics	**Metric**	**US**
Weight:	160 kg	350 lb
Length:	254 cm	100 in
Diameter:	31.5 cm	12 in
Power Supply:	115 V AC, 400 Hz, 2.3 kW	
Wavelength:	1.06 microns	
Angle or Regard:		
Roll	Unlimited	
Pitch	-160 deg to +15 deg	

Design Features. ATLIS II incorporates an automatic TV tracker, a YAG neodyne laser-illuminator/range-finder, cockpit avionics, and interface electronics. The TV tracker and laser stabilization system reduces pilot workload and allows tracking and designation even during break and stand-off maneuvers. It is self-contained, offering effective low-altitude, high-speed attack with a substantial stand-off range. The TV tracker can be cued from the aircraft HUD, pilot helmet sight, radar, or inertial system, and allows for the video recording for reconnaissance, attack assessment, or training purposes.

The pod stabilization system is located in front of the unit. It provides a stable optical path for live scene data processing, laser designation and reception, and can steer the optical line-of-sight. Visual images are reflected from a mirror into a fixed optical assembly which then focuses the image into the TV camera.

The existing F-16 display and hands-on target pod controls can be used via the sidestick controller and throttle grip. Other, less-advanced aircraft, however, require modifications, substantial ones in some cases. The Jaguar does not have a radar control stick, so a unique design had to be incorporated into the avionics system.

The pod is normally mounted on the centerline or underwing station using standard 30-inch bomb racks, but, again, modifications can be and have been made.

Operational Characteristics. The camera's output provides two field-of-view videos to the cockpit display and the automatic tracker. Laser designation energy is reflected to the dichroic portion of a combining glass set within the live scene data path. This glass passes shorter wavelength scene data but reflects laser energy so that it exists collinear with incoming scene data.

The dual-mode tracker provides area correlation and point tracking. The area correlator mode stabilizes a scene and provides designation for area or low-contrast targets. The point tracking mode is used for stationary or moving point targets. The TV camera operates both in the infrared and visual spectrum. Image magnification and bandwidth selection allow optimal contrast enhancement to allow greater target detection ranges.

A digital processor controls all pod functions: automatic testing, fire-control computation, and rate-aided tracking signals. A closed-circuit liquid circulation system allows the pod to cool itself.

In use, Thomson claims that 70 percent of attacks employ the near infrared, while 100 percent use it for target acquisition. In 30 percent of the cases, the pilot switches the spectral band for a better image-enhanced tracking. These two bands are the 0.5 to 0.7 microns and 0.7 to 0.9 microns, the latter of which has proven particularly effective in hot smog.

Variants/Upgrades

The ATLIS II name implies that it is a second-generation device. ATLIS was apparently the designation given to prototype units used during joint experiments with Martin-Marietta. The Roman numerals "II" seem to have appeared at about the time the two companies parted; evidence suggests that since that time, all ATLIS devices have actually been ATLIS II.

Night Capability. In 1992, to permit night firing of laser-guided weapons, Thomson-CSF built a convertible pod with a common rear section and two easily interchanged front sections. It boasts the same TV capabilities. The rear section incorporates the general electronic assembly, power supplies for both the laser and pod, the FLIR, and the cooling system.

The night head uses a thermal imaging camera, laser rangefinder/designator, and two laser and infrared optical devices. It successfully demonstrated its ability to identify, attack, and destroy a pinpoint target using an Aerospatiale AS 30 laser-guided air-to-ground missile during tests at Landes Trials Centre.

Program Review

Background. ATLIS development began in the 1970s as part of a joint effort between the French firm Thomson-CSF — which at the time had little experience in this area — and Martin Marietta. The result of that collaboration was the ATLIS I, a design intended to simply establish the feasibility of a laser designator on a single-seat aircraft. It flew successfully on a YF-16 in 1976, and went on to become the first targeting pod to be qualified on the F-16. This was followed by French testing on a Jaguar. The demonstration phase ended in 1979 when nine Texas Instrument bombs were launched successfully using the pod.

Differing national requirements split the team that year; Martin Marietta went on to use its experience to build the LANTIRN pod (see separate report). The LANTIRN pod incorporated a terrain-following radar and wide-field-of-view FLIR with night and navigation capabilities in addition to its navigational pod. France had no such requirement at the time, and opted to develop a pod for daytime use only at first.

France ordered about 30 pods (including prototypes) in late December 1983 for use with Aerospatiale's AS 30L and Matra's BLG laser-guided bomb. Sales to the Middle East followed in 1986. F-16 qualification was attained shortly thereafter in Fort Worth, Texas, for an unspecified customer (probably Pakistan). Of the 70 flights, there was only one incident of minor failure throughout the 120 flight hours.

Gulf War. ATLIS holds the rare distinction of having been combat-proven. French Air Force Jaguar fighter/bombers attacked key Iraqi targets using the ATLIS II with the Aerospatiale AS 30L during the Gulf War in January 1991. While the ATLIS II is suited for use on the Dassault Mirage 2000s, those aircraft used in that war flew combat air patrol missions and were not equipped with ATLIS II.

Thomson-CSF reported a success rate of over 90 percent in Desert Storm. The three reported failures were attributed to the missile being launched at excessive range.

Funding

The program is developed by Thomson-CSF for the French Air Force under contract by the French government. Specific funding expenditures are unavailable.

Recent Contracts

Contract information is unavailable.

Timetable

Early	1970s	Development began
	1976	First flight, aboard a YF-16
	1979	Demonstration phase completed
Dec	1983	First French order
	1986	First foreign sale
Jan	1991	Used in Gulf War
	1992	Night capability introduced

Worldwide Distribution

France has used ATLIS II on at least 24 of its ground attack Jaguar AS**. Thailand** uses the unit on an indeterminable number of its 18 F-16A/Bs. **Pakistan** has also purchased the system for its F-16A/Bs, of which it has 59.

Certain export Mirage 2000 and Mirage 2000 Ds, and naval aviation Super Entendards have been sold to unspecified buyers with the system.

Forecast Rationale

With ATLIS the French have intended, almost since day one, to fill a niche for nations that do not require — or cannot afford — systems such as LANTIRN. For countries lacking the funds to purchase advanced submunition dispensers and state-of-the-art weaponry, ATLIS II fills the one requirement that all air forces share: the need to attain a safe firing distance. For this purpose, ATLIS II has proven a fine alternative.

Interestingly, the modular upgrade to night capability allows users to buy only what is required for their applications. Rather than producing a complete day/night system, the ease of modification enables users to customize the upgrade to their equipment. This flexibility can translate into substantial savings for those who do not need full capability.

While specific information regarding recent sales is scarce, we have evidence that at least two F-16 users — Pakistan and Thailand — use the ATLIS II. Such nations, which have become known to squeeze the very most out of limited defense funds, will find the ATLIS II an ideal system, one that can be custom-tailored to fit any application.

With the US Air Force on the verge of a LANTIRN upgrade, prices of that system could drop in the coming years. It, coupled with the lower-priced Pathfinder/Sharpshooter variants, have racked up substantial sales recently, and will probably continue to do so. Thus, when the US Air Force unveils its upgraded system for the F-15 and F-16, ATLIS II will be three generations behind the state-of-the-art. However, this will not matter to many cash-strapped users, who will not hesitate to purchase a commercially successful, combat-proven device such as the ATLIS II.

Ten-Year Outlook

While we believe there may be small orders in the future (including spares work), we are not presently forecasting additional sales due to the unavailability of related information and the uncertainty of the market. Thus the forecast chart is omitted.

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