



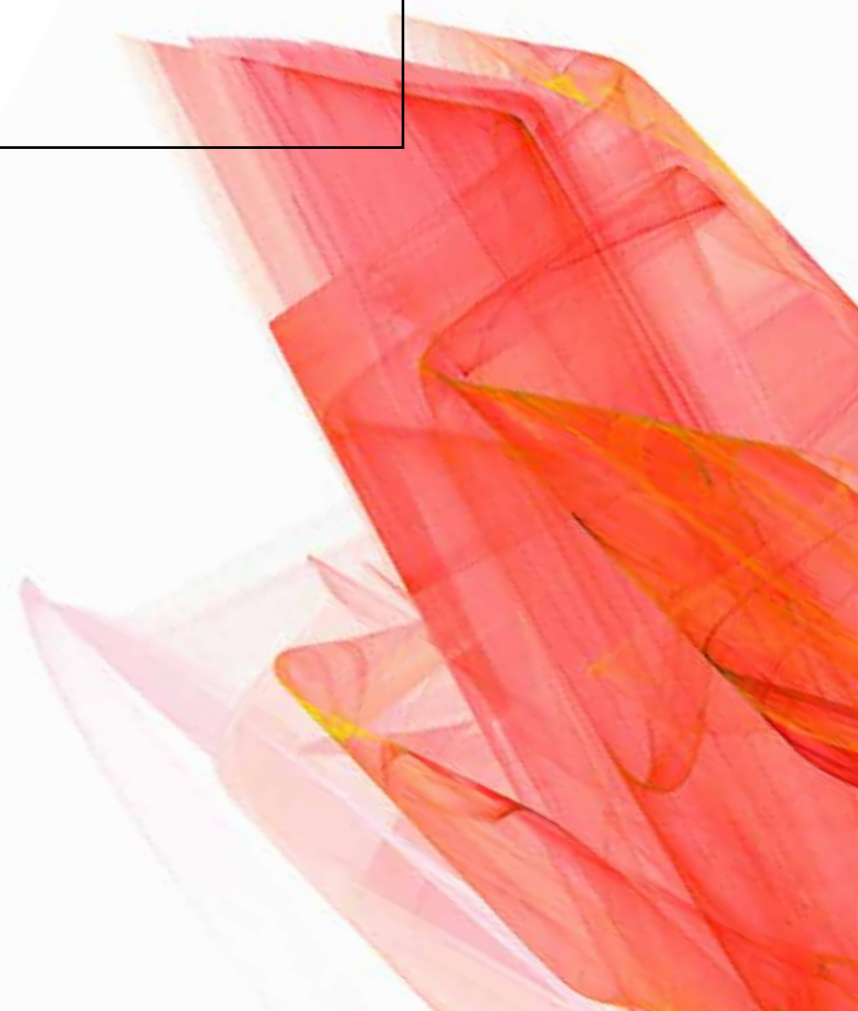
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SECURITY AND DEFENSE

ARIES-SAAS HELICOPTER CONTROL AND APPROACH RADAR

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ARIES-SAAS HELICOPTER CONTROL AND APPROACH RADAR



ARIES-SAAS radar

A versatile hardware and software design has allowed the development of multiple versions of the ARIES radar for many different military applications, such as helicopter control and approach

General description

The ARIES family is a complete Low Probability of Intercept (LPI) and High Resolution Radar (HRR) solution. It easily adapts to the requirements of a big variety of operational environments and user needs. Its flexible modular design and its unique performances in detection, tracking and identification of surface and aerial targets of a large range of sizes and speeds, make it an excellent choice for many applications, such as helicopter control and approach.

The ARIES-SAAS radar detects and determines ranges and bearing of

helicopter targets, providing information for the control and guidance as well as allowing an early warning of approaching enemy aircrafts.

The radar can be integrated with an IFF (Identification Friend or Foe) system to provide altitude and identification information.

As an option, it is possible to include in a single ARIES-SAAS radar both the capability for supporting helicopters approach and landing and air surveillance, and the capability for sea surface search

and navigation. This way, the radar includes two modes of operation: ARIES SAAS mode and ARIES NAV mode. It is possible thanks to an electronic antenna tilt control that automatically adjusts the antenna tilt and the incorporation of a dual-mode processing software. The selection of the mode of operation is done by the operator from the display unit.

In its standalone configuration, it is composed of the APTR subsystem, the process and control unit, the motor control unit, the network connection unit and the display unit.

Frequency Modulated Continuous Waveform (FMCW)

The ARIES-SAAS is suitable for the detection and acquisition of low Radar Cross Section (RCS) helicopter targets in severe clutter environments as well as supporting helicopters approach and landing manoeuvres. The system uses Frequency Modulated Continuous Waveform (FMCW), principle that enables to obtain long detection ranges with minimal peak transmission powers. This fact, together with the large bandwidths

utilized, provides Low Probability of Intercept (LPI) characteristics and high robustness against external interference.

The FMCW principle also offers a high range resolution of the order of a few meters depending on the instrumental range, coupled with an exceptional local image tracking capability. It largely surpasses all existing radar products of its class.

In the ARIES-SAAS radar, the transmission and reception of signals is done simultaneously through a double-sided antenna. It offers a high transmission gain and a high sensibility. Its radar detection range is comparable to the conventional pulsed radars with power levels of several kW.

APTR subsystem

The APTR subsystem is composed of the Antenna Unit, the Pedestal, the Transmitter and Receiver Unit and the High Power Amplifier Unit.

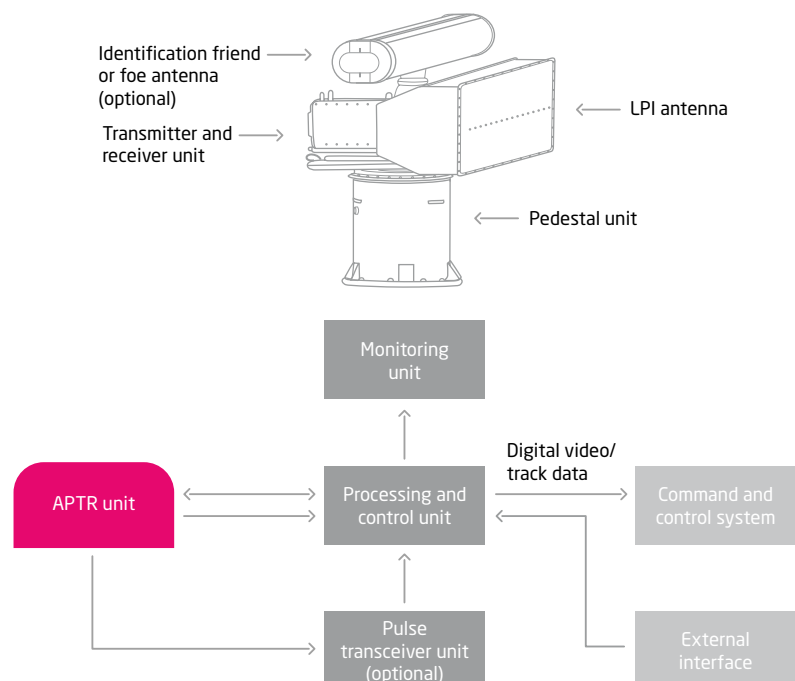
The Antenna Unit is a double-sided antenna for the independent and simultaneous transmission and reception of the radar signal. The Transmitter and Receiver Unit is located above the

pedestal and controlled by the Process and Control Unit to generate and process the radar signal. The High Power Amplifier Unit is located above the Transmitter and Receiver Unit and controlled by the Process and Control Unit to amplify the radar signal.

The APTR subsystem is a highly integrated fully solid-state RF equipment that

features one of the widest transmission bandwidths so far accomplished at its band for a commercially available radar system of this kind.

Its modular architecture and integrated BITE equipment enhance the reliability of the overall system and facilitate its maintainability.



Process and Control Unit (PCU)

The Process and Control Unit performs all the control, tracking and signal processing functions of the standalone system.

It consists of several software-configurable digital boards working in parallel, in order to ease its maintenance and the addition of new capabilities.

The core of the radar signal processing has been implemented on the latest COTS DSP boards.

The requirement for high-resolution detection and simultaneous tracking of small and extended non-cooperative targets have led to the development of specialized tracking and data association algorithms based on advanced image processing. Dedicated communication boards are also included in the system allowing the interface with multiple display consoles and external devices, such as GPS gyrocompasses and speed logs.

Motor Control Unit (MCU)

The Motor Control Unit allows controlling the APTR Subsystem motor. It can communicate with the Process and Control Unit across serial line, interchanging motor enable/disable information, turn direction, turn speed, enable/disable time, BITE, etc.

Network Communication Unit (NCU)

The Network Communication Unit allows the interconnection between the radar and the rest of the systems. Moreover, the connection between the Process and Control Unit and the Display Unit is allowed. This unit is based on a modular design, which allows the adaptation of its functionality and panelling to each interconnection. This way, it can be used with multiple connections over optical fibre or copper, and with different transmission speeds.

Display Unit (DU)

The Display Unit (standalone system configuration), provides a number of remarkable features, such as an integrated track and radar image presentation, detailed range profiling of selected targets and comprehensive system control through a series of user-friendly pop-up menus and graphical controls.

Other ARIES family applications

A versatile hardware and software design has allowed the development of multiple versions of the ARIES radar for many different military applications:

ARIES CS - Coastal Surveillance radar

This radar is designed for shore based applications and is capable of detecting small targets at short and long ranges under rough sea and severe weather conditions, reducing the risks posed by terrorism, illegal immigration or arms and drugs trafficking. Other applications include homeland security, search and rescue, and vessel traffic management systems.

ARIES S - Submarine radar

The ARIES S system represents a complete radar surveillance and navigation solution for the next generation of submarines. Its low transmission power makes it virtually undetectable by today's tactical ESM systems.

ARIES S has been designed to be installed in a non-hull penetrating architecture and the Transmitter/Receiver Unit has been reduced in size to fit inside a submarine mast.

ARIES PAR - Precision Approach Radar

This radar is intended for the support of aircraft approach and landing manoeuvres and it is normally used in conjunction with air surveillance radars. The aircraft is initially detected at long ranges by the ARIES-SAAS surveillance radar and is routed by the air controllers to the coverage area of the ARIES PAR in order to be guided along the glide path. While the PAR radar provides to the controllers the information for the control and guide of the aircraft in the landing phase, the surveillance radar is searching for other incoming aircraft.

ARIES NAV - Surface search and navigation radar

As the name implies, this radar is used as an aid to pilot the ship detecting all sea surface targets and land masses in the sea, as well as detecting low-flying aircrafts. This radar maintains a 360-degree search for all targets within line-of-sight distance from the radar, determining the ranges and bearing of the detected targets.



ARIES-SAAS installed on a ship



Landing Helicopter Dock (LHD)



ISO 9001:2000



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Ctra. de Loeches, 9
28850 Torrejón de Ardoz
Madrid (Spain)
T + 34 91 480 60 04
F + 34 91 480 60 41
aries@indra.es
indracompany.com

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