PLESS

Passive Long-range ESM Surveillance System

PLESS is a passive Over-The-Horizon (OTH) Direction Finding (DF) system developed by ERA. This direction finding system can detect, locate, identify and track air, land and naval targets with a focus on slow-moving or stationary platforms. The system processes signals from radars, jammers and datalinks emitting in a frequency band from 100 MHz to 18 GHz.

Using the unique passive detection technology by ERA, the PLESS direction finding system provides a covert mode of operation, ideal for long-term cross-border and maritime surveillance.

Thanks to the utilization of tropospheric reflectivity properties, the PLESS direction finding system can see targets located even beyond the radio horizon.

KEY FEATURES:

- Passive – using the signals emitted by the target itself
- Long-range – use of the tropospheric reflectivity properties
- Direction Finding (AoA) supported by multilateration (TDOA)
- 2D localization and tracking in case of multistatic deployment
- Pulsed and Continuous Wave (CW) signal processing and analysis
- Contribution to Emitter Database (EDB)
- ELINT features (classification, recognition and identification)
- Long-term Area of Interest (AoI) survey and early warnings
- Shared ecosystems with VERA-NG Passive ESM Tracker (PET)

USE CASES:

- ### LAND

Detection, localization, tracking, and identification of long, medium and short-range radars as a part of the Ground Based Air Defense and surveillance network. Besides radar signals can system process also communication signals (datalink, jammers) within the 100 MHz – 18 GHz frequency band.

- ### SEA

Detection, localization, tracking, and identification of various emitter types based on naval platforms. The identification process can be supported by the Automatic Identification System (AIS) used by the vessel.

- ### AIR

Long-range situational awareness – detection and identification of airborne platforms. The PLESS system can also detect and localize the Ground Control Segment of the Unmanned Aerial Systems (UAS).

- ### ELINT (ELECTRONIC INTELLIGENCE)

A key role of PLESS is ELINT functionality – data collection and exploitation (classification, recognition and identification). The received signals can be evaluated manually by an operator or by an automatic Non-Cooperative Target Identification process. Both tasks require the Emitter database (EDB) to be present. In addition, the sensor is designed to generate relevant parametrical EDB records which can be shared in real-time with other EDB based equipment such as PET (e.g. VERA-NG), Radar Warning Receivers and other EW equipment through higher echelons via standard data exchange formats.
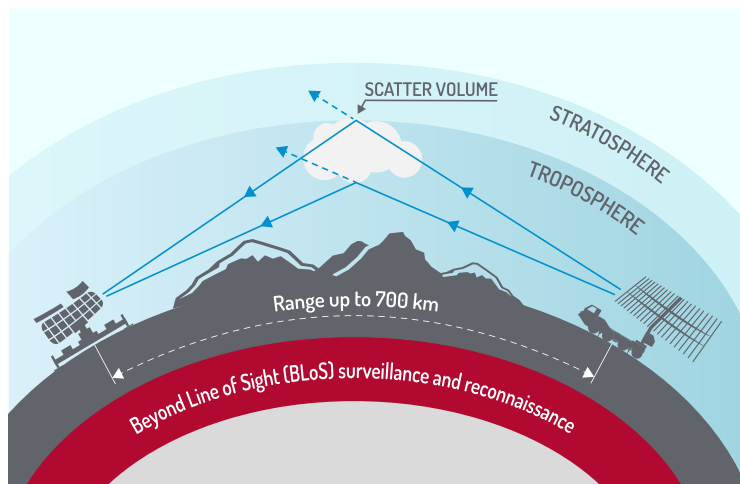
PLESS makes use of the troposphere reflectivity properties, which enables the detection of targets at a distance even beyond the radio horizon.
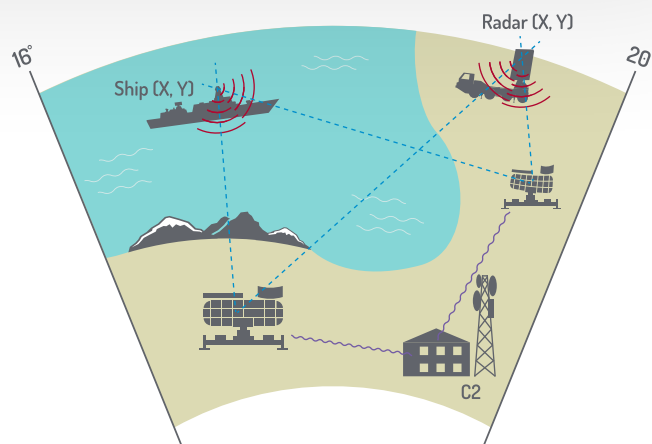
The principle of operation is the same as for any usual DF, where the sensor is measuring the Angle of Arrival (AoA) of the signal. For the 2D location of the target, at least 2 separate sensors are needed. The target position is estimated by the triangulation principle.

OPERATIONAL FEATURES:

Surveillance area	up to 700 km
Surveillance field of view	360° by rotation (30° instant field of view)
Processed bandwidth	100 MHz to 18 GHz
Operational modes	Direction finding + surveillance Manual, assisted, automatic modes
DF accuracy	RMS less than 0.5° for troposcatter (frequency 1-18 GHz)
Processed signals	Pulsed signals, CW signals
Internal data formats	IQ, FFT, PDW
Crew	1 per station, remote control options
Configuration	Stationary or deployable
Antenna station weight	Less than 16 tons
Transportability	ISO 1CC shelter format – truck transportable, suitable for airlift
Deployability	Maximum autonomy, deployable <30 min by crew of 2