

The airborne defense suite TALISMAN

Application

The airborne defense suite (ADS) Talisman is intended for aircraft protection against:

- all types of guided Air-to-Air (AAM) and Surface-to-Air (SAM) missiles fitted with active (semi-active) radar seekers;
- all types of guided Air-to-Air and Surface-to-Air messiles fitted with electro-optical (IR and semi-active laser) seekers;
- ground-based air defense systems, employing command-guided SAMs.

The ADS Talisman also ensures aircraft protection against the 'friendly fire' of air intercept missile systems as well as ground-based air defense systems.



ADS Talisman pod's exterior view

Design and Installation Variants

The ADS Talisman may be either pod-mounted or installed conformally provided there is sufficient inner fuselage space available in aircraft. The pod-mounted variant of the ADS Talisman is housed in two small-size pods with them to be mounted on the under-wing weapon stations of the carrier and spaced apart for the maximum distance possible (up to the wing tips).

The pylon design of the pods provides for the suspension of the air launchers, which allows for the Talisman ADS- carrier to preserve its standard aircraft weapons (keeping the weapon stations 'vacant').

The effectiveness of the aircraft protection in the forward and rear hemispheres with the ADS Talisman amounts to 0.9 and higher.

The protection effectiveness is understood to mean the probability of the ADS Talismancarrier not to be engaged by guided missile weapons.

All the equipment of the ADS Talisman is housed in two pods.



ADS Talisman installation on the aircraft



ADS Talisman installation on the Mig-29



ADS Talisman installation variant on the Su -25



ADS Talisman protection sectors

Configuration

Index	Baseline Configuration
—	Radar Warning Equipment
1	Electronic Protection Equipment (8.0 - 12.0 GHz)
Index	Options available
2	Electronic Protection Equipment (12.0-18.0 GHz)
3	Electronic Protection Equipment (6.0-8.0 GHz)
3E	Electronic Protection Equipment (4.0-8.0 GHz)
R	Missile Approach Warning Radar

Electronic Protection Equipment

Electronic protection equipment (EPE) ensures the individual protection of the host aircraft based on the reemission of the hostile RES (radio electronic system) probe signals with them being provided with the particular phase, frequency, amplitude and polarization modulation. RESs are understood to mean:

- fighters' on-board radar sighting systems (RSS);
- target attack radars of SAM-systems;
- active radar seekers (ARS) of the guided AAMs and SAMs;
- semi-active radar seekers of the guided AAMs and SAMs.

Electronic Protection Equipment

The modulated reemission in each hemisphere simultaneously together with the echo signal from the carrier air-frame (the one of the aircraft under protection) results in the wave front distortion, perceived by the antenna systems of the hostile RESs, thus exerting an all-inclusive impact on angle, range and velocity (Doppler) measuring instruments as well as the tracking systems of the hostile RES. This impact shows in the form of stable false targets (marks) substantially spaced from the true range, Doppler, azimuth and elevation coordinates of the aircraft under protection.

False targets perform guided maneuvering, thus simulating the flight of the real target.

At the same time any changes in the probe signal's parameters such as carrier frequency, pulse width and pulse repetition frequency, the modulation type and the power level of the emitted signal of the jammed hostile RES are immediatly registered.

The jamming impact happens to be concealed at the signal level and is not detected by standard ECCM equipment and the one for jamming analysis.

The impact of the EPE on the suppressed RESs is ensured at all stages of the RES operation.



Jamming of the hostile on-board tracking radar in the surveillance mode



False target acquisition by the hostile on-board radar



Missile steering towards the false target



Affecting the radio proximity fuse of the hostile missile

Radar warning equiment

Apart from radar warning, the ADS Talisman provides a possibility to analyze the effectiveness of impact on the jammed RES. The analysis is executed by monitoring the response of the jammed RES to the jamming impact. The results of the current effectiveness monitoring are displayed to the pilot of the aircraft under protection directly in the course of the flight in real time.

The given data are registered by the in-built flash-storage device and may be studied after landing.

Missile approach warning radar (MAWR)

MAWR is intended to notify the crew of the guided missiles (with any types of control systems) approaching in the forward and rear hemispheres. Protection against electro-optical guided missiles is gained by means of the time (range, angle sector and automatic or automated anti-missile evasive maneuvering) optimization of flare dispensing.

Main advantages

Automatic (with no pilot/ operator input) jamming generation against all hostile illuminating RESs

No restrictions on the number of the simultaneously jammed on-board and ground-based RESs

Total exclusion of the ADS-carrier self-radiation

The employment of the ADS places no restrictions on the air combat tactics of the aircraft under protection

When in close formation, the ADS-carrier securely covers a friendly neighbouring aircraft with no EAE (electronic attack equipment)

Full electromagnetic compatibility with the self radio electronic equipment (the one of the aircraft under protection), including the on-board radar, as well as the compatibility with the on-board radar of the neighbouring aircraft in formation

Operational reliability

The operating condition of the ADS is monitored during the pre-flight checks as well as directly in the course of the flight. The in-built test system ensures the walkthrough of the equipment operability, as well as detection and localization of the equipment failure within the accuracy of the block.

Installation

The ADS Talisman may be installed on any type of the aircraft with the minimum retrofit of the on-board equipment. The aircraft board retrofit includes the installation of the control and display panel in the cockpit, as well as the installation of the HF and LF cables inside the wing and fuselage. The retrofit of the aircraft board may be executed at the aircraft repair facility or in the field. For the aircraft fitted with interfaces 1553 or 1760 (MIL STD- 1553, MIL STD -1760) the connection of the ADS is carried out through the interfaces, mentioned above.

ADS Talisman installation on the aircraft



ADS Talisman installation on the aircraft equipped with interface 1553/1760



Main characteristics

Frequency range	Electronic protection equipment (1)	8.0-12.0 GHz
	Electronic protection equipment (2)	12.0-18.0 GHz
	Electronic protection equipment (3)	6.0-8.0 GHz
	Electronic protection equipment (3E)	4.0-8.0 GHz
MAWR	Minimum range of the missile approach warning (the missile with a RCS of 0.01 m ²)	1 km
	Maximum range of the missile approach warning (the missile with a RCS of $0.01m^2$)	3 km
	The probability of accurate warning	0.95 and more
	The probability of false warning	0.05 and less
ADS sectors of	In azimuth	± 45°
protection in the	In elevation	± 30°
hemispheres		
Number of pods		2
Single pod's weight		65 kg*
Overall dimensions	2280 mm x 230 mm x 290 mm**	
Power supply	+ 27 V	
Power consumption	500 W and less	

» * Weight for Talisman Block 1

** The pod's dimensions are given for the aircraft Mig-29