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558 AIRCRAFT REPAIR PLANT

UPGRADE OF MiG-29 AIRCRAFT



225320 Republic of Belarus, Baranovichi
50 let VLKSM Str., 7



ISO 9001

BUREAU VERITAS
Certification
No BY228992Q-U



EN 9100

BUREAU VERITAS
Certification
No 7264005-REVO



ARMAMENT OF SERIES AND UPGRADED MiG-29 AIRCRAFT



Armament of series and upgraded MiG-29 aircraft

- Armament of series aircraft
- Additional armament of upgraded aircraft
- Electronic countermeasures protection means

"Air-to-air" guided missiles	P-27P, P-27T P-273P, P-273T P-73, P-60M PBB-AE	
"Air-to-surface" guided missiles	X-29Л, X-29Т, X-31А, X-31П, X-25МП	
Guided bombs	КАБ-500Л, КАБ-500КР	
Aviation bombs	АБСП 100-500кг, АБСП 500кг	
Unguided air-to-surface missiles	С-8, С-5, С-13, С-24	
ECM "Satellite-M2" equipment		

Increase of combat capabilities of the upgraded aircraft is achieved as follows:

- 01** Applying expanded assortment of "air-to-air" and "air-to-surface" precision air weapons;
- 02** Implementation of mapping modes with low, mean and high resolution;
- 03** Display of coordinates of the detected ground targets for targeting formation.

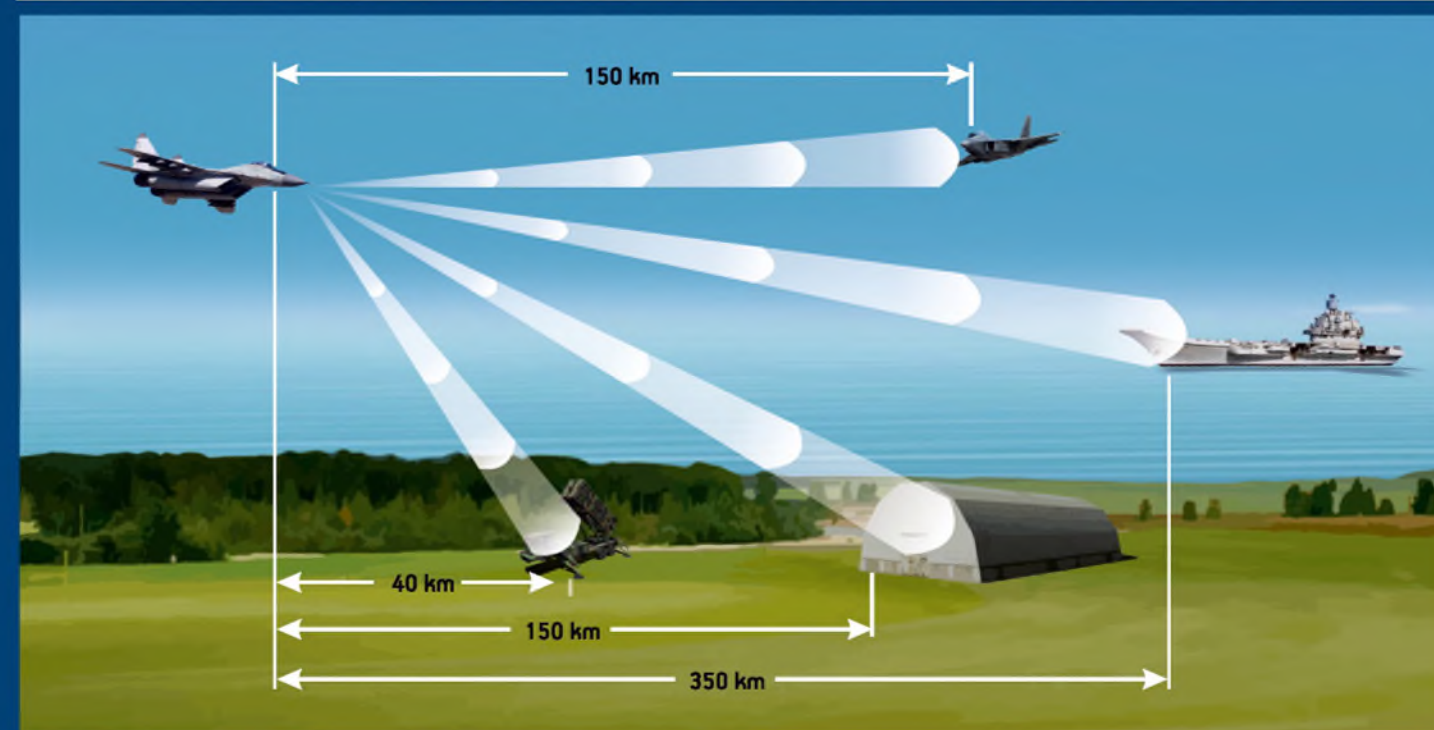


IMPLEMENTATION OF NEW OPERATION MODES OF RADAR SIGHTING SYSTEM

Provides:

- 01** Applying "air-to-air" missiles PBB-AE with active homing head (AHH);
- 02** Implementation of mapping modes with low, mean and high resolution;
- 03** Applying X-31A "air-to-surface" guided missiles with active homing head for surface targets damage;
- 04** Display of coordinates of the detected ground targets for targeting formation.

Increase in combat capabilities due to H019 radar targeting system modernization and implementation of autonomous radar channel



Target detection at a distance:

150 km	MiG-29 type in FHS (in early warning mode)	40 km	"Launcher" type with RCS 30 m ²
150 km	"Hangar", "railway bridge" type with RCS 1000 m ²	350 km	Ground targets in real beam overview mode.

NAVIGATION SYSTEM CAPABILITY ENHANCEMENT

Provides:

99 points
Input and storage of data about waypoints, aerodromes, radio beacons for each type (6 points in series variant);

5 +/- meters
Accuracy in determination of the aircraft location current coordinates (+/- 700 m in series variant);

8 routes
Data generation and storage (2 routes in series variant);

0,2 m/s
Ground speed error;

VOR/ILS, DME
Capability of navigation performance according to ICAO standard;

2 systems
Automatic and manual change of navigation points in flight.

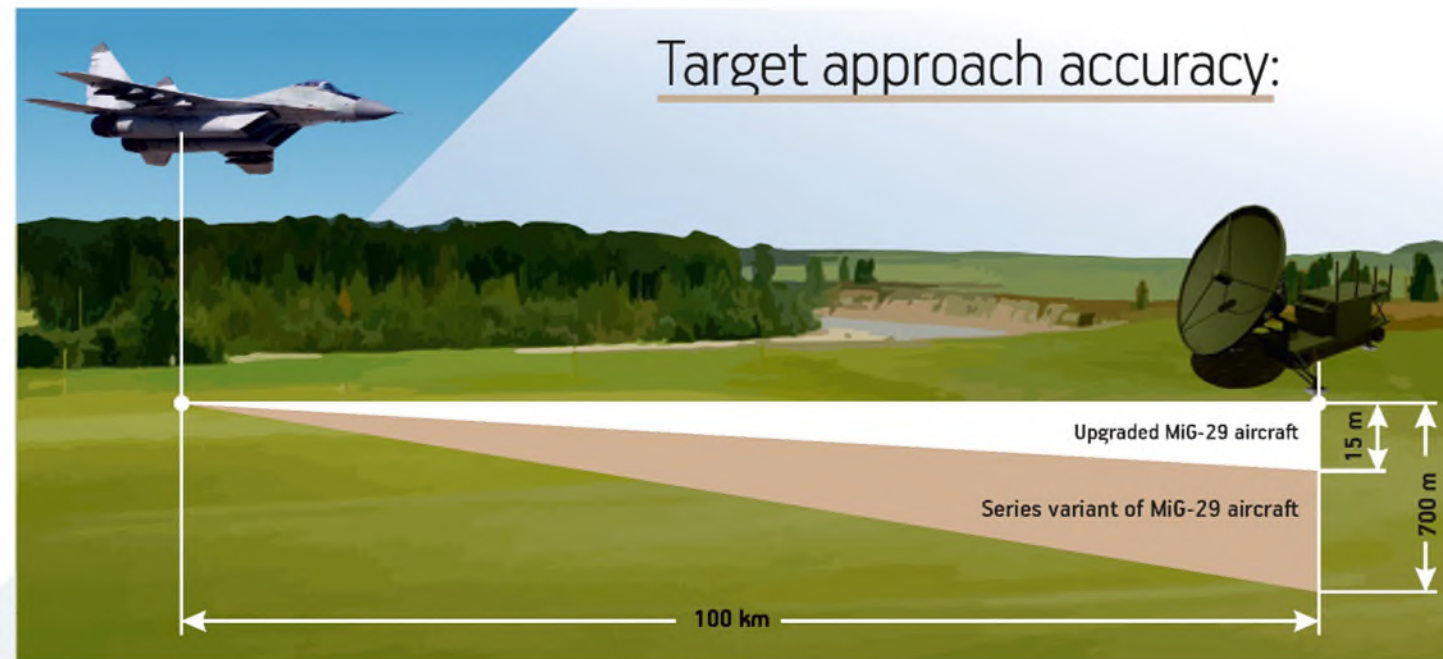


Image on multifunctional display (MFD) in navigation mode

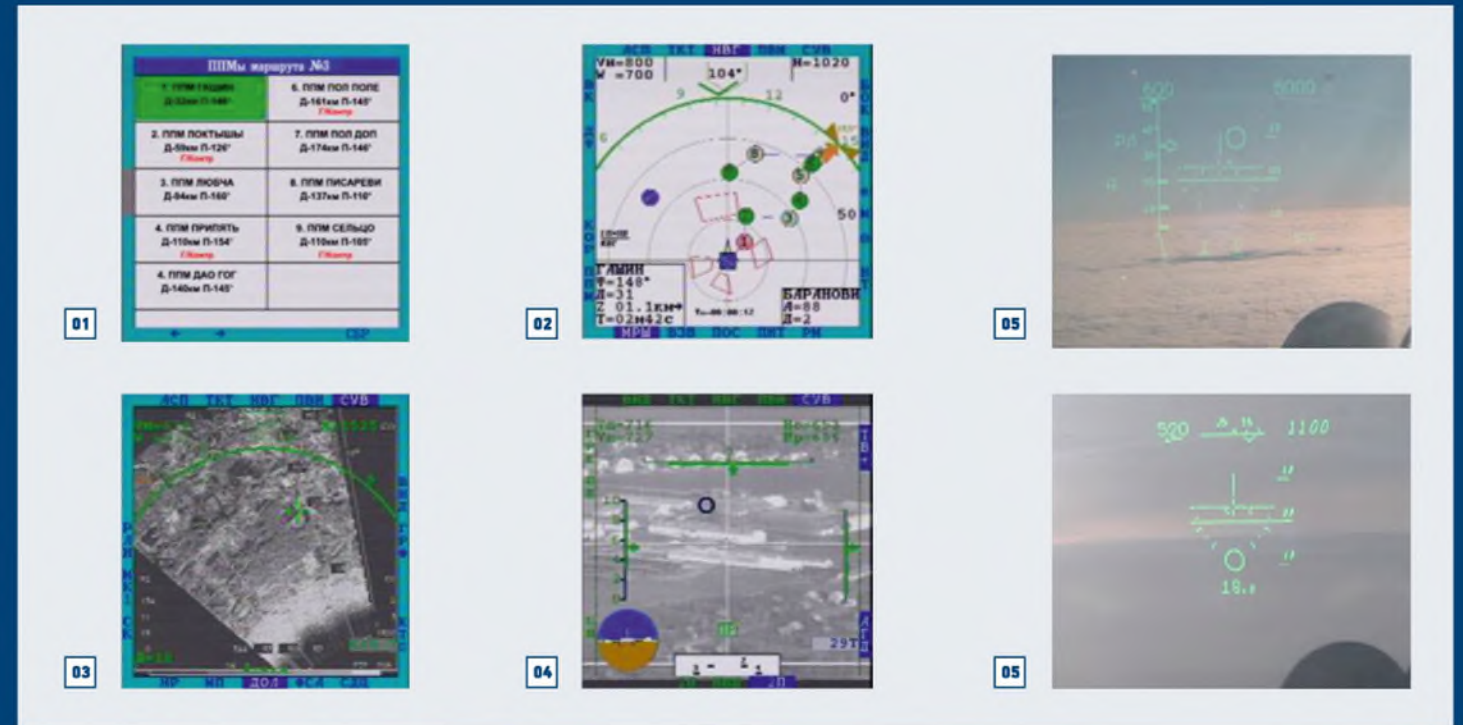


VIDEO RECORDING SYSTEM

Provide: recording of communications systems audio signal and video information from MFD and HUD

Information frames from multifunctional display

- 01. Flight route
- 02. Navigation mode
- 03. Radar scanning mode
- 04. Television image from TV homing head of X-29T missiles
- 05. Video recording image of external environment and HUD information



Upgrade of the aircraft cockpit control and navigational equipment

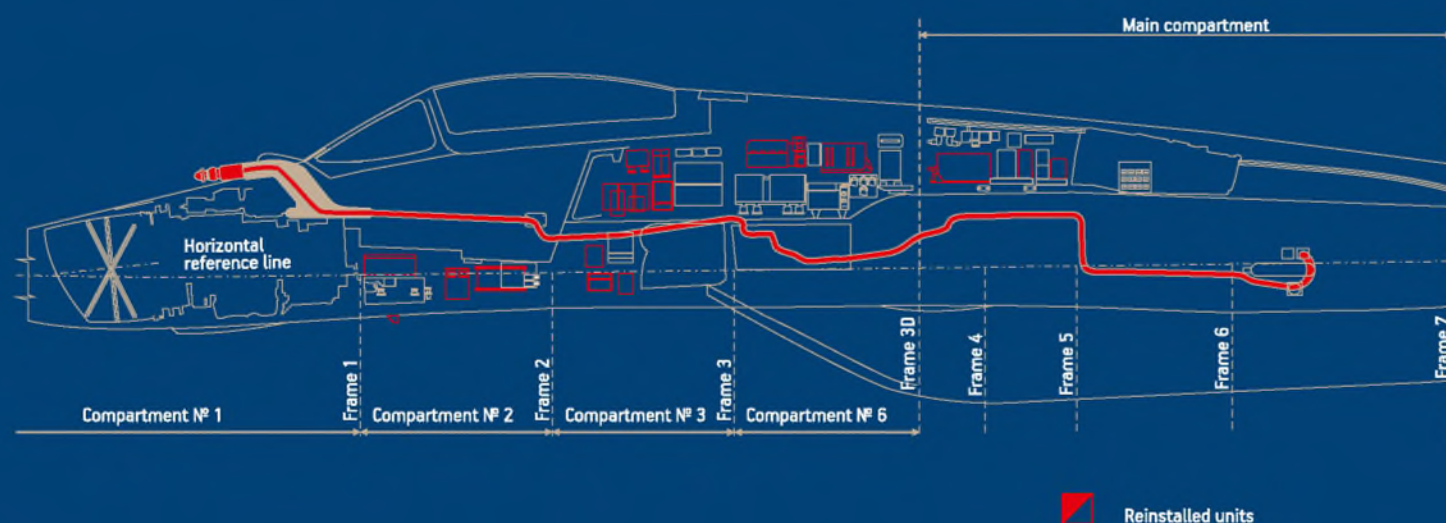


COCKPIT CONFIGURATION OF THE MODERNIZED AIRCRAFT

- 01. Television camera of video recording system
- 02. Interface unit of video recording system and solid-state recorder
- 03. Multifunctional display
- 04. "Экран-14М-2" system indicator
- 05. ECM "Satellite-M2" equipment control and indication board

EXTENDING FLYING RANGE

GPT-2E (receiving fuel head) universal fuel receiver



Maximum flying range of upgraded MiG-29 aircraft

2900 km With three extra-long-range fuel tanks unrefueled and without armament;

4900 km With three extra-long-range fuel tanks and one air refueling.

INSTALLATION OF REALTIME INFORMATION ANALYSIS SYSTEM

Provides:

- 01** Coordinate data transmission of detected ground targets to ground control stations;
- 02** Operational control over aircraft equipment performance;
- 03** Control over aircraft airspace position;
- 04** Provision of assistance to the pilot in particular cases;
- 05** Storage of information about flight parameters from ground operator;
- 06** Flight personnel training;
- /07** Ground targeting.



GROUND SYSTEM OF INFORMATION RECEIVING AND TRANSMISSION



"SATELLITE-M2"* – FIRE HITTING PROTECTION AGAINST HIGH-PRECISION RADIO GUIDED WEAPON

* AIRBORNE ECM PROTECTION SYSTEM

Designation

"Satellite-M2" individual airborne ECM protection system is designed for individual ECM protection system of the aircraft, whatever the type, from high-precision radio guided weapons launched from enemy Airborne Interceptor Missile Systems (IMS) and Air Defense Missile Systems (ADMS);

High-precision radio guided weapons include Airborne Interceptor Missile Systems and Air Defense Missile Systems carrying missile with semi active and active radar homing heads.

Operation principle

01. Survey stage

02. Lock-on tracking and launching missile on decoy target



"SATELLITE-M2"* – FIRE HITTING PROTECTION AGAINST HIGH-PRECISION RADIO GUIDED WEAPON

* AIRBORNE ECM PROTECTION SYSTEM

Reliable ECM protection is achieved by means of active jamming which effects:

01 angle measurement channels of fighter-interceptors and aircraft radio-location aiming complexes

02 active (semi-active) homing heads of guided aircraft missiles and antiaircraft guided missiles.

Jamming create concealed guided crippling of angle measurement follow-up systems, execute leads guided missile to:

- intense alternating accelerations;
- flight path curvature;
- substantial decrease of flight range due to depletion of the engine energy potential;
- increase of current and terminal miss.



ECM "Satellite-M2" on MiG-29 aircraft

Objects of ECM "Satellite-M2" impact:

01 – airborne radio-location aiming complex of Su-27, MiG-29, MiG-25, MiG-23, MiG-31, Su-30 aircrafts of all modifications, including phase array "БАРС" floodlight, F-15, F-16, F-18, F-22, Mirage-2000, EF-2000

02 – homing heads of P-27P, AIM-120 AMRAAM, AIM-7 "Sparrow", "Activ Sky Flash", "Matra Mica", MIM-23B, MIM-104, 9M38 missiles

03 – "Оса", "Тунгуска", "Roland", "Gepard", "Patriot", "Бук-М1" ADMS

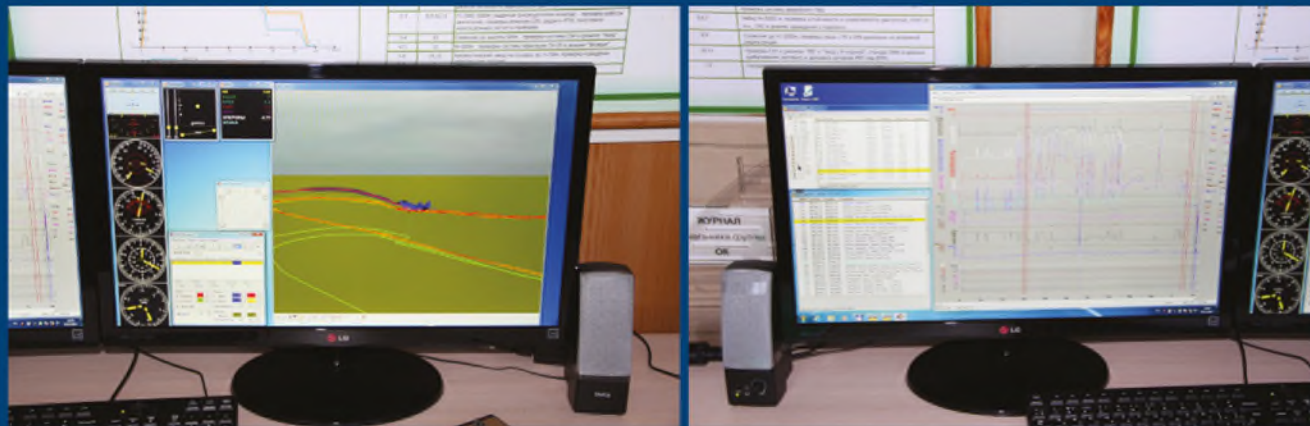
“ДВИНА-М” AUTOMATED FLIGHT INFORMATION PROCESSING SYSTEM

The system is intended for:

- 01 Reading;
- 02 Operational processing;
- 03 Storage of flight information, registered by such devices as “Тестер”, “Гамма”, “МСР-64”, “СОК УБД”, “Экран”, БУР-4, БР-4Т-3, БУР-1-2, БУР-4-1-10, БУР-СЛ-1.



FLIGHT DATA RERECORDING UNIT



WORK STATION OF “ДВИНА-М” INFORMATION PROCESSING SYSTEM OPERATOR

“ДВИНА-М” INFORMATION PROCESSING SYSTEM

Provides:

- 01 Multiwindow operation mode including operation on several monitors in all Windows operating systems;
- 02 Multilanguage capability (Russian, French, English);
- 03 Operational adjustment for the type of airborne recording device and particular aircraft;
- 04 Flight data input into PC from flight data preparation unit of “Экран” system flash-cassette, airborne storage units from stock re-recording means as “УВ3-3”, “Обзор-МС”, etc;
- 05 Operational review and automated processing of flight information receiving diagrams, tables and statistics with printer output capability;
- 06 Simultaneous flight data analysis for “Экран” system from different airborne systems (ТЕСТЕР, БЦВМ-1,2, МБК РЛ etc.);
- 07 Express analysis and control of aircraft information between flights;
- 08 Terrain route building using digital map or satellite images and dynamic visualization of aircraft flight and primary instrument readings in 3D graphics reflecting ground profile, with approved diagram guiding and displaying registered video images and audio information in a particular window;
- 09 Archivation and long-term storage of flight information on removable optical media.