

MI-35P HELICOPTER



MAIN COMBAT TASKS

DESTRUCTION OF VEHICLES AND MANPOWER

- ❑ Mobility enhancement of the army forward units and their air support at the battlefield
- ❑ Search and destruction of light-armoured and unarmoured vehicles, command posts and other control centers day and night in various weather conditions
- ❑ Destruction of enemy's helicopters in the air
- ❑ Destruction of air-defence assault (seaborne assault) and landing of airmobile units in assault dropping zone and support of their combat activities
- ❑ Air reconnaissance

MANEUVER ENSURING AND SUPPORT OF TROOPS ON THE BATTLEFIELD



VERSIONS OF APPLICATION

TROOP CARRIER



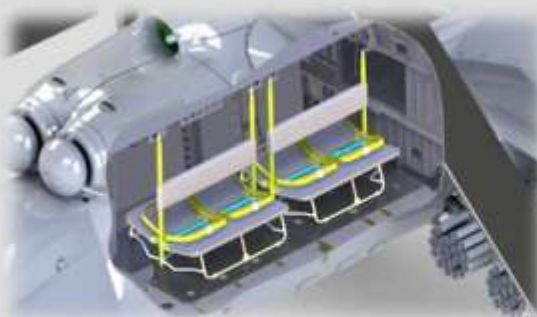
Airlifting of 8 fully armed troopers in cargo compartment.



AMBULANCE VERSION

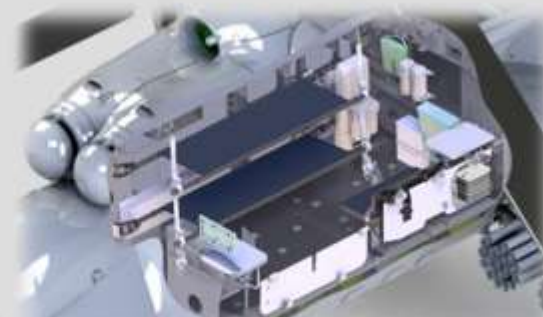


Airlifting of two stretcher cases and two sitting wounded men with one medical attendant.



CARGO CARRIER

Airlifting of cargo up to 1500 kg inside the cargo compartment and up to 2400 kg on an external sling.



MI-35P HELICOPTER

Provides for round-the-clock accomplishment of combat tasks using the installed armament in various physiographic regions.

MAIN CHARACTERISTICS

AIRCRAFT COMBAT SURVIVABILITY

ARMAMENT COMPLEX

AIRCRAFT AND RADIO-ELECTRONIC EQUIPMENT

PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

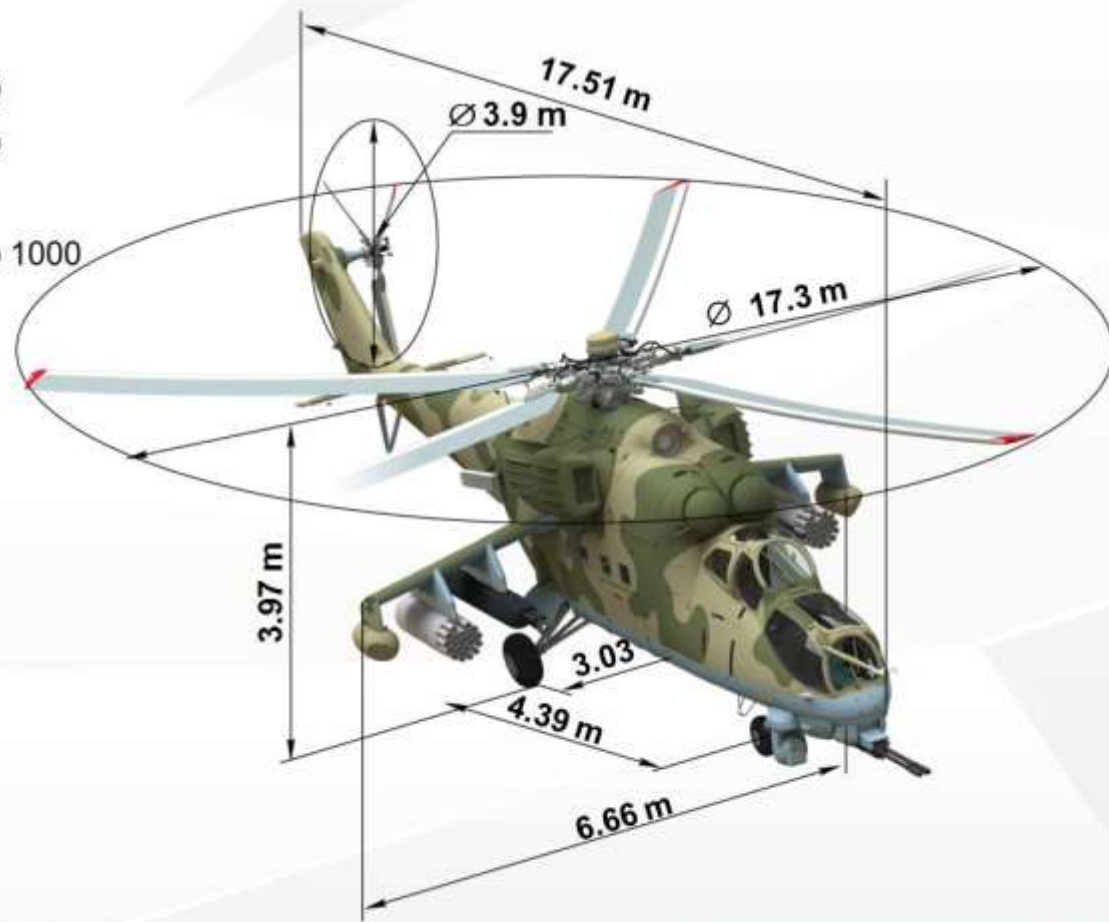
OPTIONAL EQUIPMENT



MAIN CHARACTERISTICS

Normal take-off weight, kg	11200
Maximum take-off weight, kg	11500
Cargo weight on the external sling, kg	2400
Maximum speed, km/h	320
Cruise speed, km/h	280
Hover ceiling, m	1750
Service ceiling, m	4500
Operational range, km	450
Ferry range, km	up to 1000

Engine type	TV3-117VMA
Take-off power, H.P.	2x2200
Crew	3



4500

SERVICE CEILING

m



320

MAXIMUM SPEED

km/h



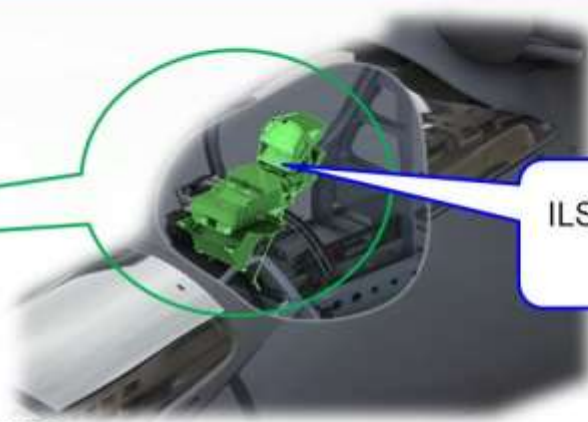
450

FLIGHT RANGE

km



ARMAMENT COMPLEX



ILS-28 ser.2 Head-up display

AMMUNITION ALLOWANCE (pcs.)

TYPE OF AIR WEAPONS

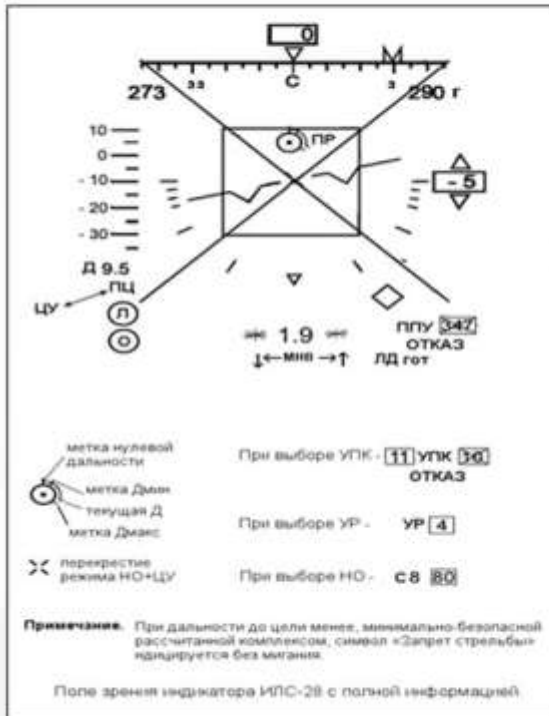
	AMMUNITION ALLOWANCE (pcs.)	TYPE OF AIR WEAPONS
	450	NPPU-23 non-removable flexible gun unit housing GSh-23L gun of 23 mm caliber
	40+450	2 B8V20-A rocket packs housing S-8KOM of 80-mm caliber, ammunition set of NPPU-23 gun - 450 rounds
	40+450	2 B8V20-A rocket packs housing S-8KOM of 80-mm caliber, ammunition set of NPPU-23 gun - 450 rounds
	80+450	4 B8V20-A rocket packs housing S-8KOM of 80-mm caliber, ammunition set of NPPU-23 gun - 450 rounds
	500+450	2 UPK-23-250 universal gun pods housing GSh-23L of 23-mm caliber, ammunition set of NPPU-23 - 450 rounds
	40+500+450	2 B8V20-A rocket packs housing S-8KOM rockets of 80-mm caliber, two UPK-23-250 universal gun pods, ammunition set of NPPU-23 gun - 450 rounds

ARMAMENT COMPLEX

ILS-28 ser.2 HEAD-UP DISPLAY

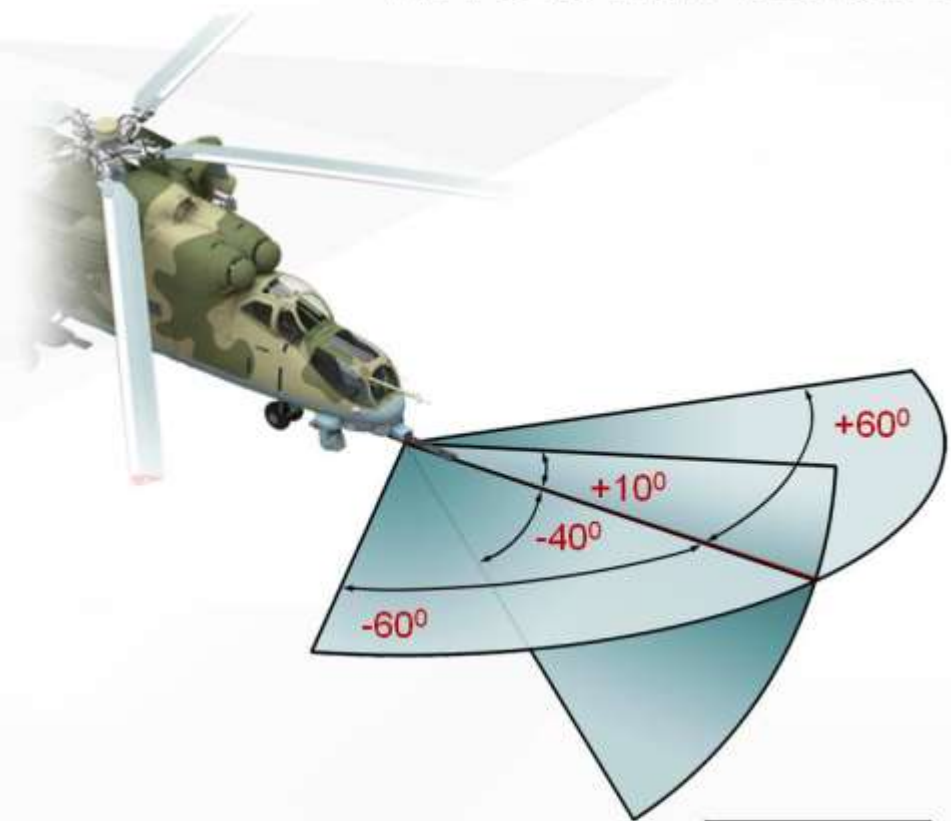
The helicopter is fitted out with ILS-28 ser. 2. head-up display which provides sighting by the pilot.

The display is intended for indication of flight and navigation data and sighting data in all modes of flight and combat application of the helicopter.



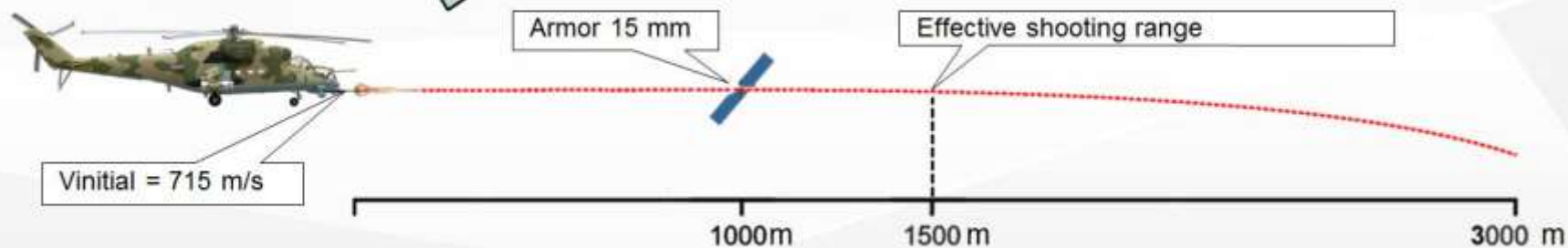
ARMAMENT COMPLEX

NPPU-23 NON-REMOVABLE FLEXIBLE GUN UNIT



MAIN CHARACTERISTICS:

Type of gun	GSh-23L
Caliber, mm	23
Destruction range, km	Up to 3
Shooting rate shot/min	3000-3400
Initial projectile speed, m/s	715
Ammunition allowance, rounds	450
Projectile type	OFZ-23-AM-GSh OFZT-23-AM-GSh BZT-23-AM-GSh



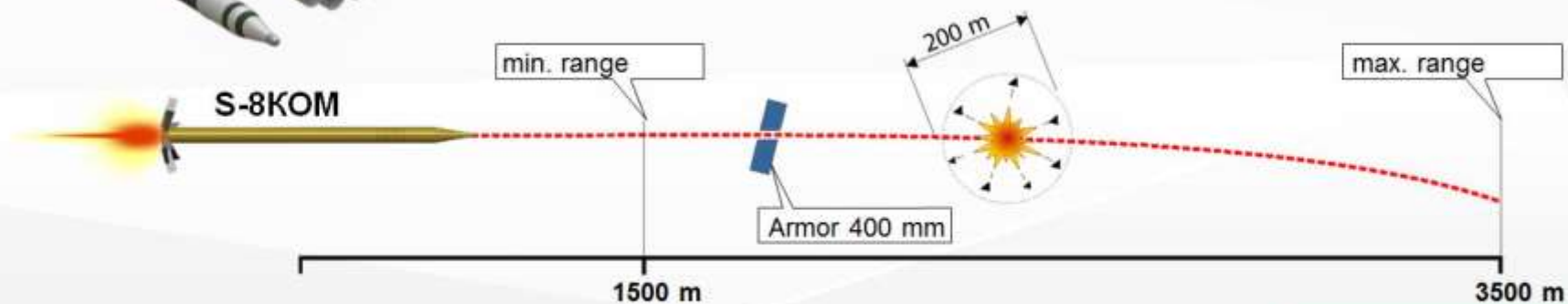
ARMAMENT COMPLEX

S-8KOM UNGUIDED ROCKETS



MAIN CHARACTERISTICS OF S-8KOM

Launcher type	B8V20-A
Caliber, mm	80
Destruction range, km	3.5
Maximum speed, m/s	600
Ammunition allowance, rockets	20 rockets in one unit
Type of warhead	Hollow-charge-fragmentation
Weight of rocket / warhead, kg	11.6/3.7
Armor piercing capability, mm	400-420



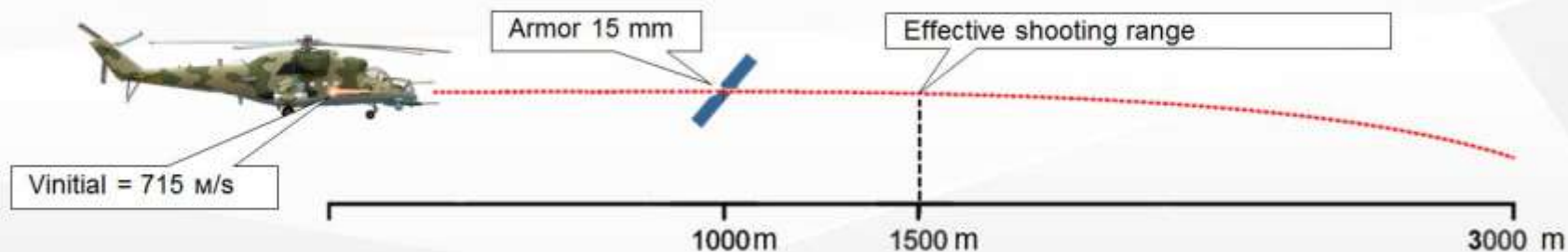
ARMAMENT COMPLEX

UPK-23-250 UNIVERSAL GUN POD



MAIN CHARACTERISTICS:

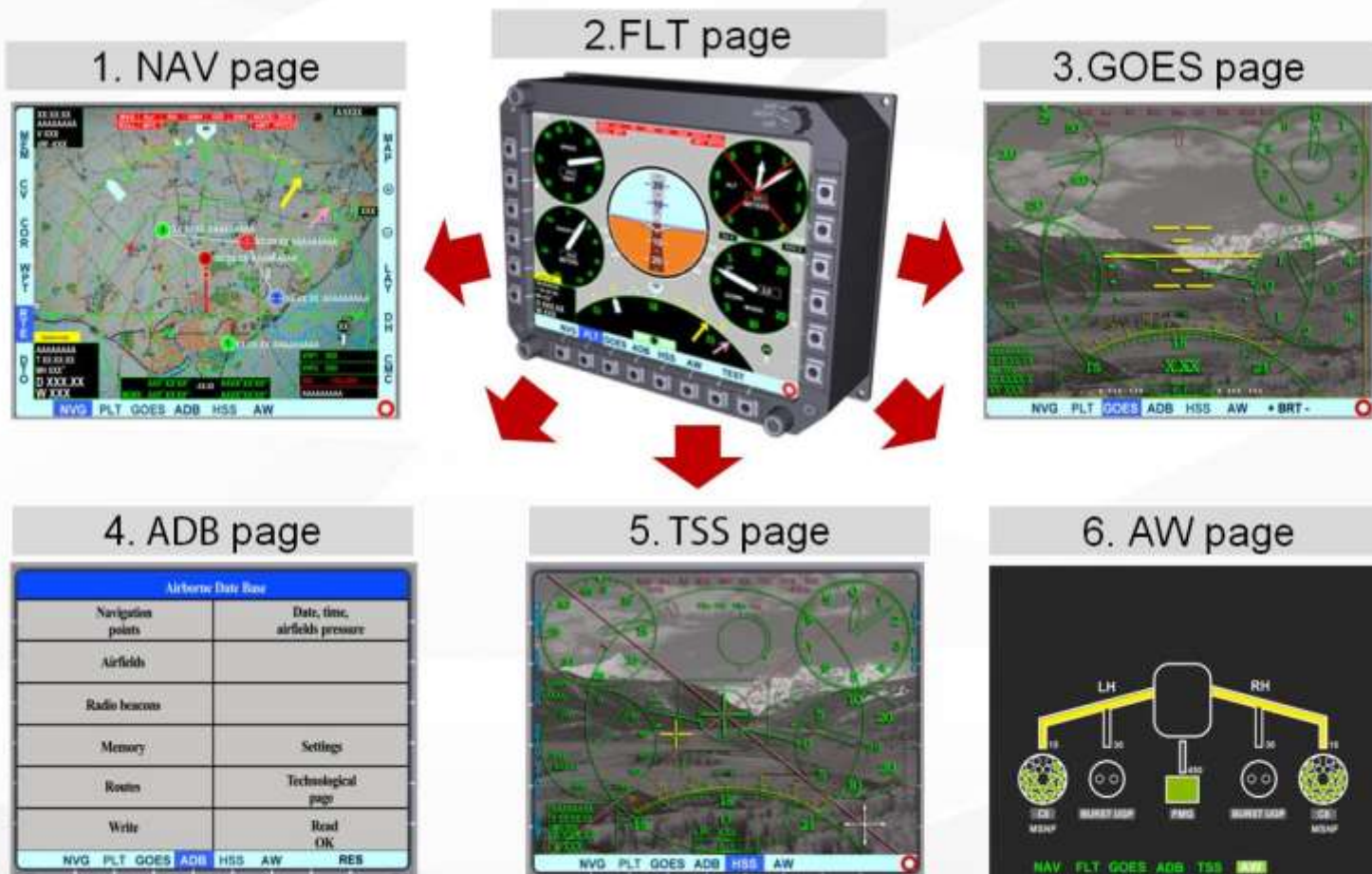
Type of gun	GSh-23L
Caliber, mm	23
Destruction range, km	Up to 3
Shooting rate shot/min	3000-3400
Initial projectile speed, m/s	715
Ammunition allowance, rounds	250
Type of projectile	OFZ-23-AM-GSh OFZT-23-AM-GSh BZT-23-AM-GSh
Weight of pod with gun and ammunition allowance, kg	Not more than 260



PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

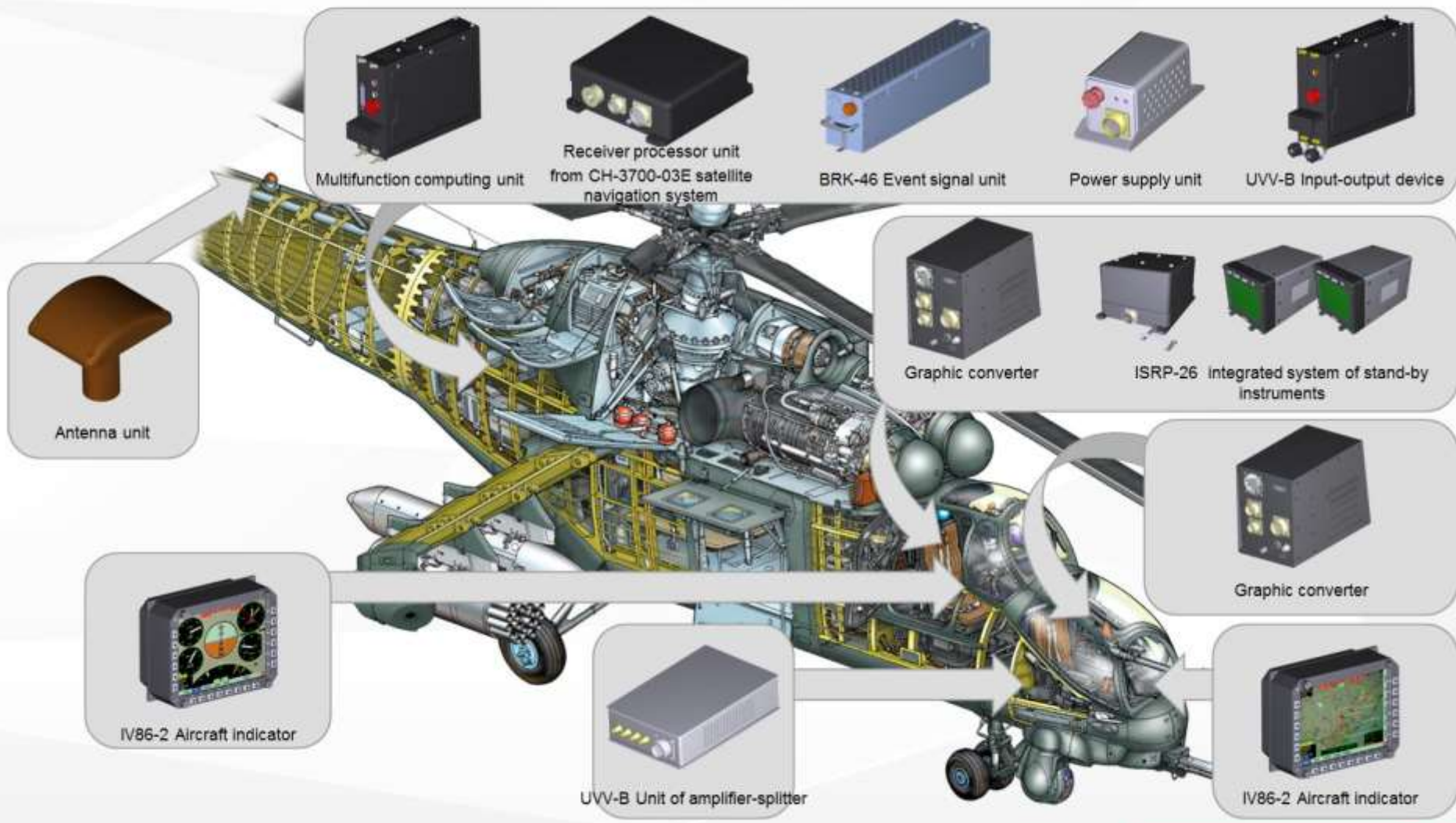
KNEI-24E-1 NAVIGATION AND ELECTRONIC INDICATION COMPLEX

The complex is intended for processing of data coming from aircraft systems and equipment and for output of the following pages on MFD:



PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

KNEI-24E-1 NAVIGATION AND ELECTRONIC INDICATION COMPLEX



PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

KNEI-24E-1 NAVIGATION AND ELECTRONIC INDICATION COMPLEX

MAIN CHARACTERISTICS:

Accuracy of detection of the helicopter location: a) in autonomous reckoning mode , using data coming from Doppler system and attitude and heading reference system b) in correction mode of GLONASS satellite navigation system (Russia) and/or NAVSTAR (USA) satellite system	not more than 6 % of the covered distance during the first hour of flight not more than 160 m
Time required to be ready to start operation Data programming and storage in nonvolatile memory of the aircraft data base of navigation objects and flight routes.	not more than 3 min provided, database can store up to 8 routes (up to 24 waypoints in each) and 192 navigation objects
Memorization and storage of coordinates of operative waypoints, date, time and waypoints fly-over time in non-volatile memory	provided, data of up to 20 operative waypoints can be stored in the database
Storage of electronic map of location in nonvolatile memory	provided, display module of MFD ensures storage of maps separately for MFD of pilot-in-command and for MFD of operator
Graphic representation of the covered route	provided, with the possibility of scale changing at the background of the electronic map of location or without the map
Indication of data about the failures of the components of the complex and aircraft systems relating to the complex as well as data about aircraft reaching the limits in pitch, roll and flight altitude	provided, data about failures of 8 types of equipment and reaching pitch angle of 30°, roll angle of 15°... 45° (maximum value depends on flight altitude) is indicated, as well as aircraft descent to the alert altitude selected at the indicator of radio altimeter

PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

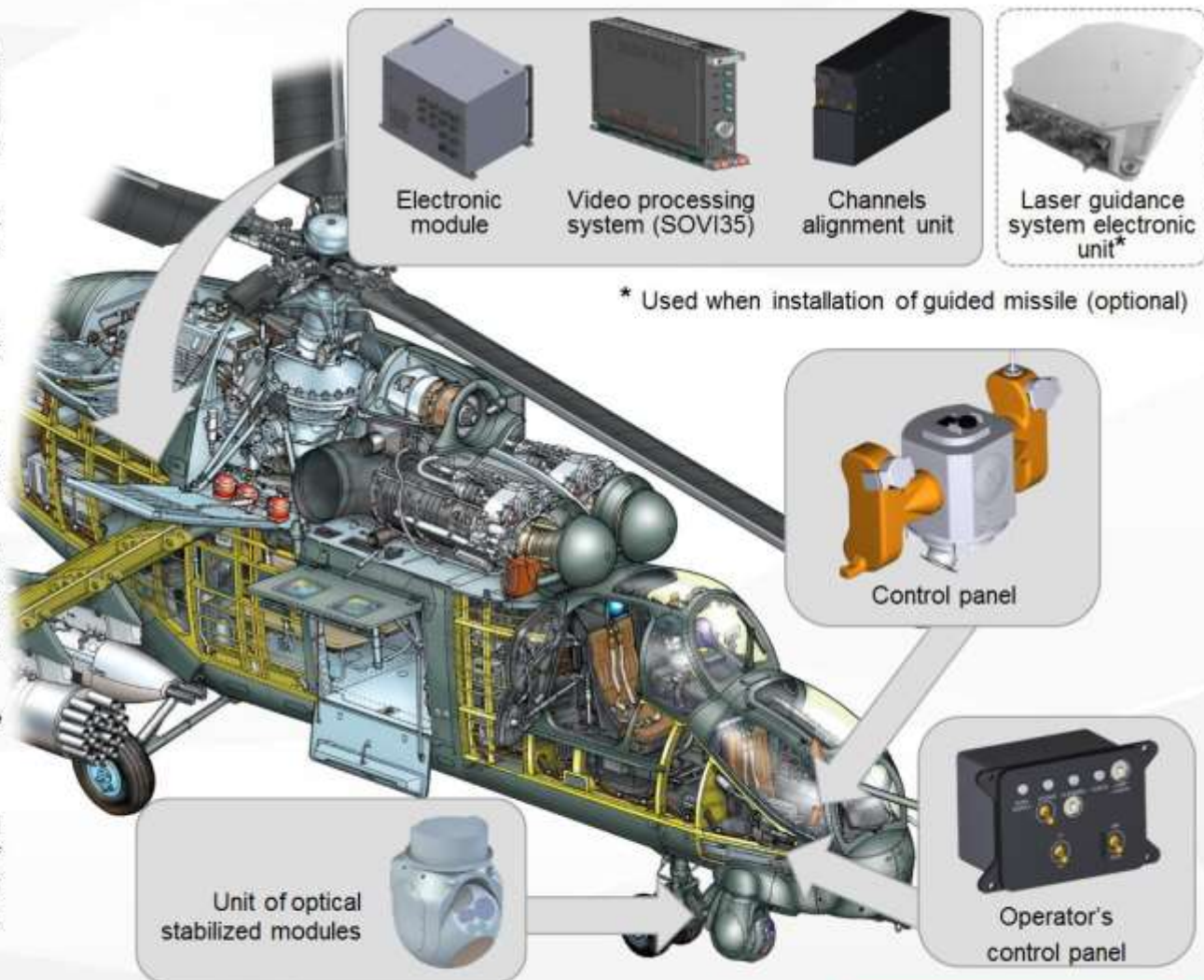
OPS-24N-1L SURVEILLANCE SIGHTING SYSTEM

System provides:

- ❑ Underline surveillance, search, destroy, recognition of different targets and objects, including low speed areal targets round- the-clock in simple and adverse weather conditions;
- ❑ Measuring of slant range to the target by the Pilot, Operator and its display to sighting-computing system;
- ❑ Manual, automatic and program-corrected target tracking during combat application of armament systems
- ❑ Application of unguided rockets, UPK-23-250, NPPU-23 in OPS-0 mode as well as application of NPPU-23 by the Operator in movable mode;
- ❑ Output of video signal to MFD as a "OPS" information page containing pointing mark in coincidence with optical axis, IR/TV-channel, laser range finder.

In terms of optional equipment the system provides the following:

- ❑ Application of laser guidance system;
- ❑ Generation of launch permission signal in PrVK-24-2, output of signals of moving mark angular position on MFD to PrVK-24-2 and Pilot's sight during his operation with guided missile.



PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

STRUCTURAL ELEMENTS OF OPS-24N-1L

STABILIZED OPTIC MODULES BLOCK

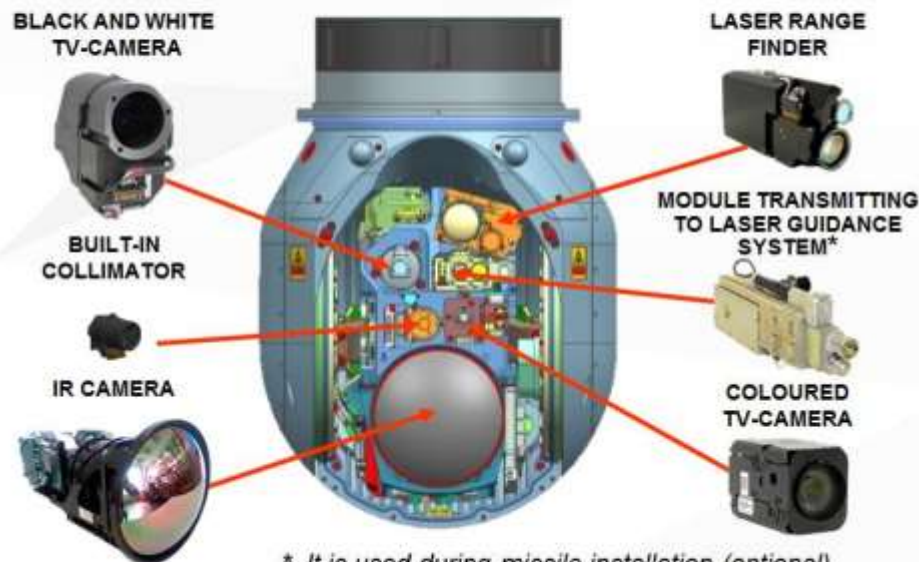
The following is used in OPS-24N-L structure: high-sensitive thermal imager operating (matrix 640x512) both night and day time in long-wave band (8-12 mk), fitted out with long-focus compact objective with three fields of view.

Except the thermal imager a high-definition black and white (matrix 1024x768) and coloured cameras (matrix 1024x768) being a part of the OPS-24N-1L are used for day operations.

A new laser range finder used in OPS-24N-1L allows to measure the distance to the chosen objects and targets with a pinpoint accuracy.

SOVI35 VIDEO PROCESSING SYSTEM

SOVI35 is an equipment for target acquisition and tracking with a system to enhance black and white / coloured images.



SOVI35 item Изделие as a part of the OPS-24N-1l provides the following:

- target acquisition and tracking chosen by the Operator;
- Image enhancement due to the signal conditioning in artificial and natural interferences (haze, fog, rain, snow, dust, whiteout, glare) – full-range histogram processing of brightness, maintaining of definite-level brightness (parrying of white, black);
- electronic stabilization of image;
- Image complexing from different-spectrum channels (TV + IR);
- Automation of objects' detection in the field of view with display of potential target markers on indicator's screen to take a decision by the Operator;
- Formation of character-graphic information on the display screen;
- two-contour combined tracking – as per frame and object

PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

OPS-24N-1L SURVEILANCE SIGHTING SYSTEM

MAIN CHARACTERISTICS:

Maximum range of target detection of "T-80 tank in the open" type with the dimensions of (7012x3582x2355) mm in normal conditions, m: a) daytime (for TV channel) b) at night (for IR channel)	8000-10000 8000-10000
Maximum range of target recognition (identification) of «T-80 tank in the open» with the dimensions of(7012x3582x2355) mm in normal conditions, m: a) daytime (for TV channel) b) at night (for IR channel)	6000-8000 6000-8000
Range of slant ranges to be measured by laser range finder, m	from 300 to 10000
Range of angles of line of sight, degree	In heading ± 230 , in pitch from minus 80 up to + 30
Maximum angular speed of control over line of sight, degree/s	from 2,7 to 10,0; minimum 0,02
Field of view of TV channel	wide 10,0°x7,5°, middle 6°x4,5°, narrow 1,4°x1,1°, in scale mode the image is zoomed twice, fourfold increase
Field of view of IR channel	wide 10,0°x8,0°, middle 4,8°x3,8°, narrow 1,5° x 1,2°, in scale mode the image is zoomed twice

PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

PrVK-24-2 SIGHTING-COMPUTING COMPLEX



BDS-24
Unit of differential selsyns

BTsU-24
Digital control unit

PrVK-24-2 sighting-computing complex is intended for processing of input information from sensors' equipment and matched systems of aircraft equipment of the helicopter and calculation of ballistic corrections and other output parameters and commands which provide decision of combat tasks in all flight modes as well as modes of ground preparation and control.

The Complex solves the following tasks:

- calculation of angular corrections as well as zones of permitted, prohibited and effective ranges to provide application of NPPU-2, unguided armament.
- calculation and display for indication of angular corrections for NPPU-23, unguided armament, helicopter angle of shift and commands to put the helicopter on the attack heading;
- formation of information on technical condition of the Complex and its integral parts in flight, provision of the crew with data on failures of subsystem and units being its integral part.

PROVISION OF ROUND-THE-CLOCK COMBAT APPLICATION

ADAPTATION OF INTERNAL AND EXTERNAL LIGHTS FOR APPLICATION OF NIGHT VISION GOGGLES

The helicopter Lights (external and internal lighting equipment) have been modified to exclude optical emission within the waves' band length of 630-900nm for NVG application by the Pilot and Operator.

Lights adaptation provides the helicopter flying day and night at different level of illumination.

The helicopter external Lights include: VPPF-1A landing and search light and FPP-9 taxi light.

VPPF-1A light provides optical emission within the following wavelength band:

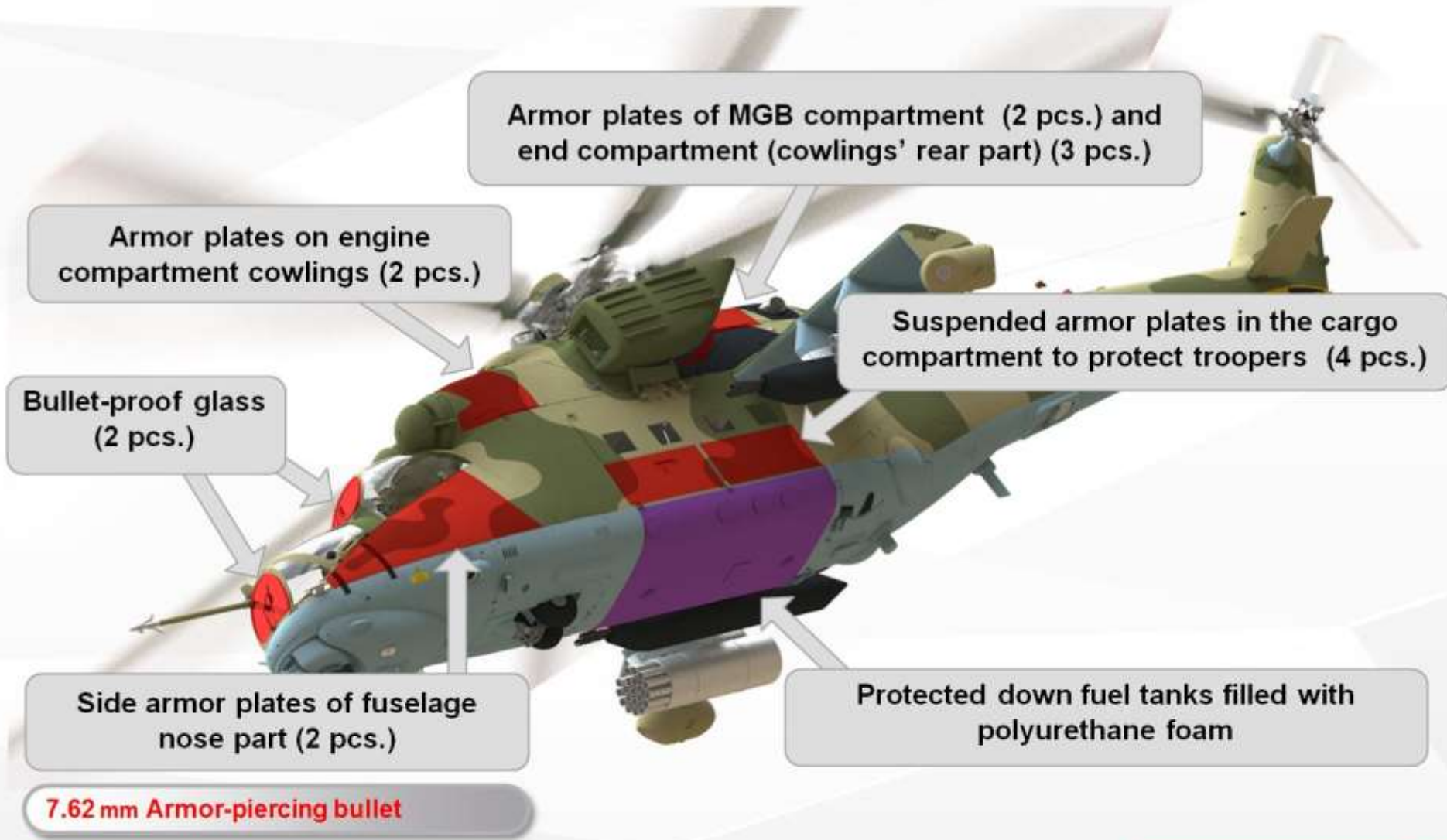
- Visible (light) – “VISIBLE” operation mode;
- IR - “STEALTH” operation mode

FPP-9 light is provided with removable IR light filter.



HELICOPTER COMBAT SURVIVABILITY

ELEMENTS OF ARMOR PROTECTION AND PROTECTED FUEL TANKS



AIRCRAFT EQUIPMENT

PILOT INSTRUMENT PANEL

In order to improve the Pilot's cockpit ergonomics the location of main piloting and navigation instruments, power plant operability instruments and annunciators on the Pilot's instrument panel have been relocated.

1. IV86-2 Multifunctional indicator
2. AChS-1;K Clock
3. Video module VM-26
4. Radio altimeter
5. 2UT-6K Engine gas temperature indicator
6. UR-117V Engines mode indicator
7. Main Rotor rpm indicator
8. UShV-1K ser. 2 Rotor pitch indicator
9. UP-4 Accelerometer
10. ITE-2T Engines compressor RPM indicator
11. USV-350PZ Speed indicator
12. AGR-29RS-15 Gyro horizon
13. VR-30PZ-1 Rate-of-climb indicator
14. VM-15PZ-1 gyro horizon



AIRCRAFT EQUIPMENT

PKV-8-35 INTEGRATED FLIGHT SYSTEM

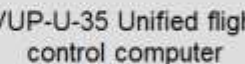
PKV-8-35 integrated flight system is designed for efficient piloting control of the aircraft in manual, automatic, directional and combined controls in all flight modes from take-off to landing and provides for:

- Enhancement of helicopter controllability and stability;
- Automatization of control of helicopter angular position and attitude in all flight modes;
- Reduction and simplification of pilots actions in manual, automatic, directional and combined piloting controls

BSA-35 adaptation and coupling unit



VUP-U-35 Unified flight control computer



BDPI-MM Block of primary sensors



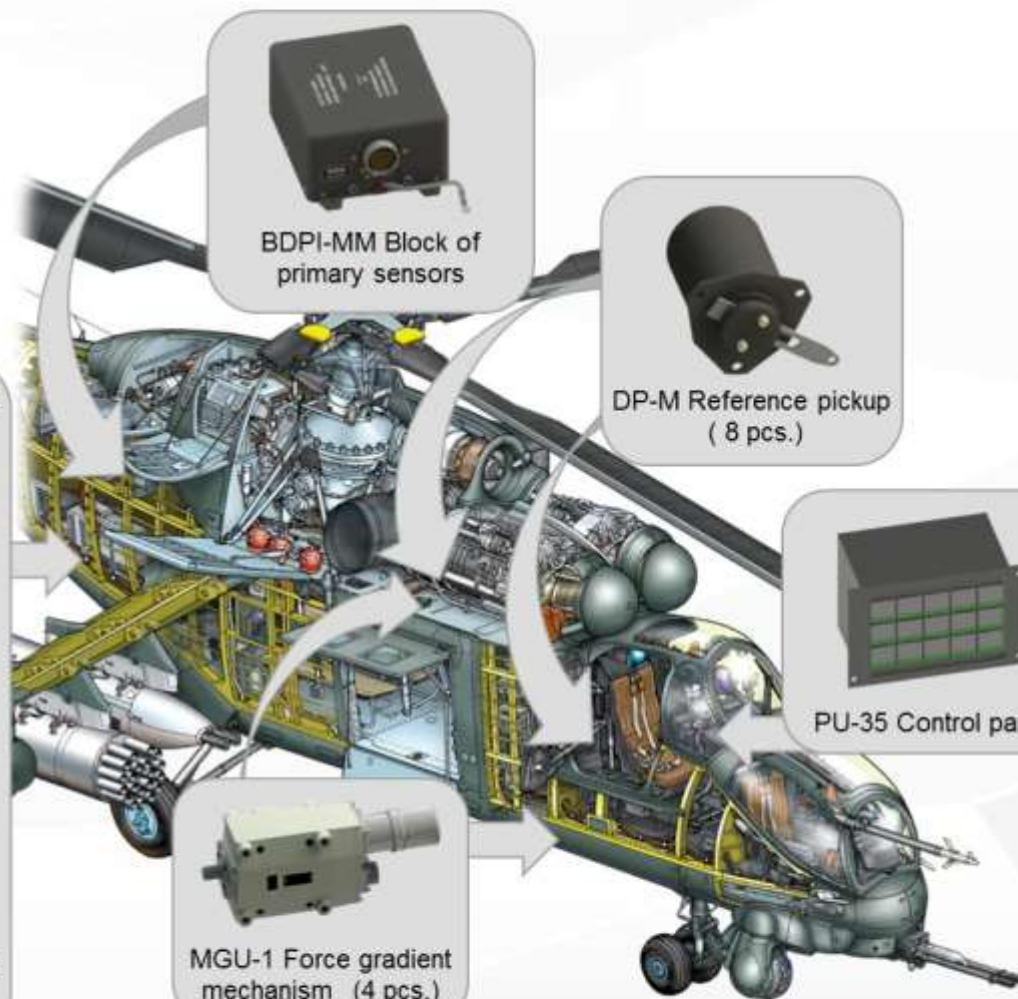
DP-M Reference pickup (8 pcs.)



PU-35 Control panel



MGU-1 Force gradient mechanism (4 pcs.)



AIRCRAFT EQUIPMENT

PKV-8-35 INTEGRATED FLIGHT SYSTEM

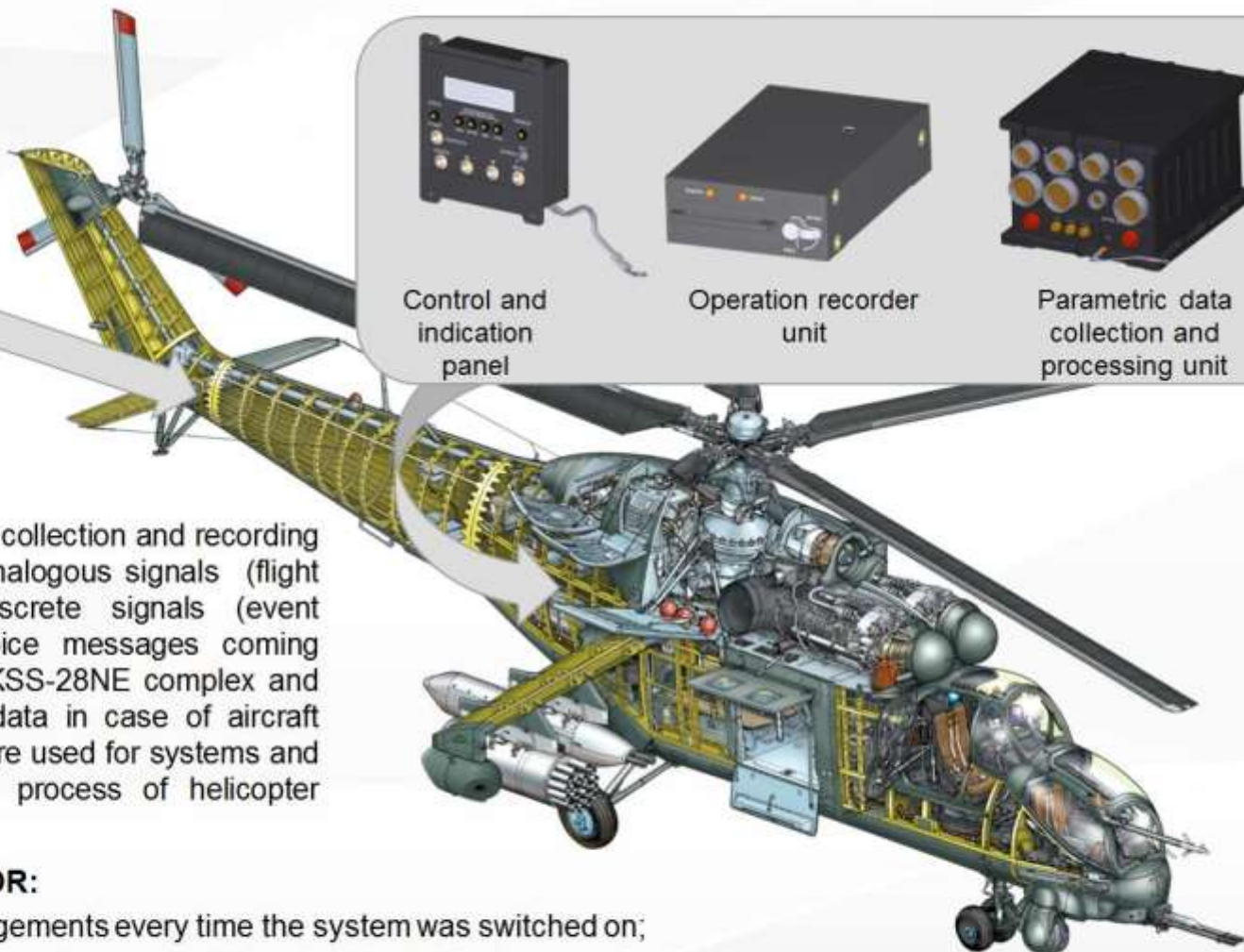
MAIN CHARACTERISTICS:

Hold error of helicopter flight parameters:

- yaw angle	$\pm 1,5^\circ$
- roll angle	$\pm 1^\circ$
- pitch angle	$\pm 1^\circ$
- pressure altitude	± 20 m
- indicated speed	± 10 km/h
- in hovering mode	
• by altitude	$\pm 1,5$ m
• in longitudinal and lateral directions	2 m
- in terms of longitudinal and lateral ground speed components set by the pilot in "Low Speed Hold" mode	$\pm 0,5$ m/s
- in "Route" mode	
• when helicopter is automatically held on the route	± 20 m
• when stabilizing the course, manually set by pilot	$\pm 2^\circ$

AIRCRAFT EQUIPMENT

CODER-35 FLIGHT DATA RECORDER



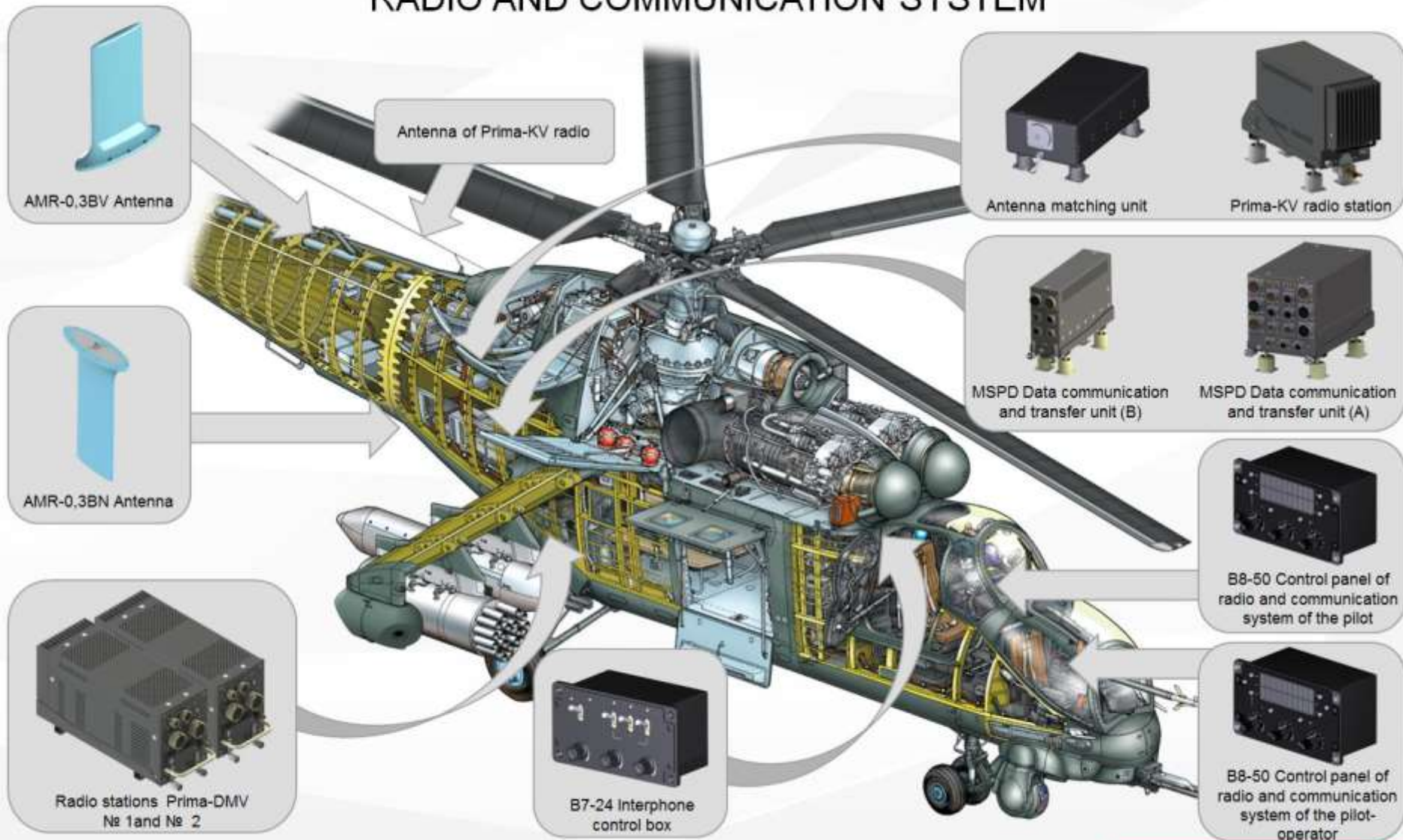
KODER-35 is designed for collection and recording of parametric data (15 analogous signals (flight parameters) and 17 discrete signals (event signals), recording of voice messages coming through two channels of KSS-28NE complex and storage of the recorded data in case of aircraft accident; the stored data are used for systems and equipment control in the process of helicopter operation),

KODER-35 PROVIDES FOR:

- Number of system engagements every time the system was switched on;
- Recording of service parameters: current time, built-in-test features, and operation parameters : flight date, flight number helicopter tail number.

RADIO AND ELECTRONIC EQUIPMENT

RADIO AND COMMUNICATION SYSTEM



RADIO AND ELECTRONIC EQUIPMENT

RADIO AND COMMUNICATION SYSTEM

MAIN CHARACTERISTICS:

VHF radio stations PRIMA-DMV provide:

- receipt and transmission of amplitude-modulated signal within the frequency range of 118,000 - 136,975 MHz with spacing of operational frequency 8,33 kHz and 25 kHz	Emission class A3EJN
- receipt and transmission of frequency and phase modulated signal with spacing of operational frequency 25 kHz within frequency range: <ul style="list-style-type: none">• 100,000 - 149,975 MHz• 156,000 - 173,975 MHz• 220,000 - 399,975 MHz	Emission classes F1BBN, F3EJN Emission class G3EJN Emission classes F1BBN, F3EJN
Number of pre-programmed communication channels	40
Time of continuous operation for cycle transmission 1:3 (1 minute- transfer, 3 minutes– receipt), hr	24
Guard channel emergency frequency channel	121,5; 156,8 and 243 MHz

HF radio station PRIMA-KV provide:

- Receipt and transmission of signals within frequency range from 2,000 to 29,9999 MHz with spacing of operational frequency 100 Hz	Emission classes J3E, R3E, H3E/A3E, J3E, F1B, G1B, J7D
Number of pre-programmed communication channels	40
Time of continuous operation for cycle transmission 1:3 (1 minute- transfer, 3 minutes– receipt), hr	12

RADIO AND ELECTRONIC EQUIPMENT

DISS-32-28E DOPPLER SPEED AND DRIFT ANGLE SENSOR



Monoblock with functional modules



Is intended for automatic and contiguous measurement of Doppler frequency shift of three antenna beams for further analysis and calculating of three speed vector components, helicopter ground speed and drift angle by KNEI-24E-1 complex

RADIO AND ELECTRONIC EQUIPMENT

DISS-32-28 DOPPLER SPEED AND DRIFT ANGLE SENSOR

The sensor is operable when flying over any kind of underlying surface (land, sea, sands, ice) regardless of visual conditions and season of the year.

MAIN CHARACTERISTICS :

Type of emission	Continuous electromagnetic oscillations
frequency of emitted UHF-energy, MHz	13320 ± 3
Operational frequency range, m	2 – 6500
Range of vector components based on measurement of Doppler frequency shift by body-fixed coordinates :	
<ul style="list-style-type: none">• longitudinal, km/h• lateral, km/h• vertical, km/h	From minus 200 up to 500 ±120 ±50
Time of continuous operation, h, not more than	6

RADIO AND ELECTRONIC EQUIPMENT

A-053-17 RADIO ALTIMETER

Radio altimeter is designed for measurement of helicopter flight height over any kind of underlying surface at any time of the day within the whole speeds range (including hovering mode) and output of these data to KNEI-24E-1 complex and PKV-8-35 integrated flight system and two altitude indicators in the cockpit (both pilot's and gunner-operator's cockpit are provided with one indicator each).



Antennas

Main technical data:

Range of measured altitudes, m	0-700
Readiness time, min, max	1
Time of continuous operation, h	12

Radio altimeters produces audio signal "Alert altitude".



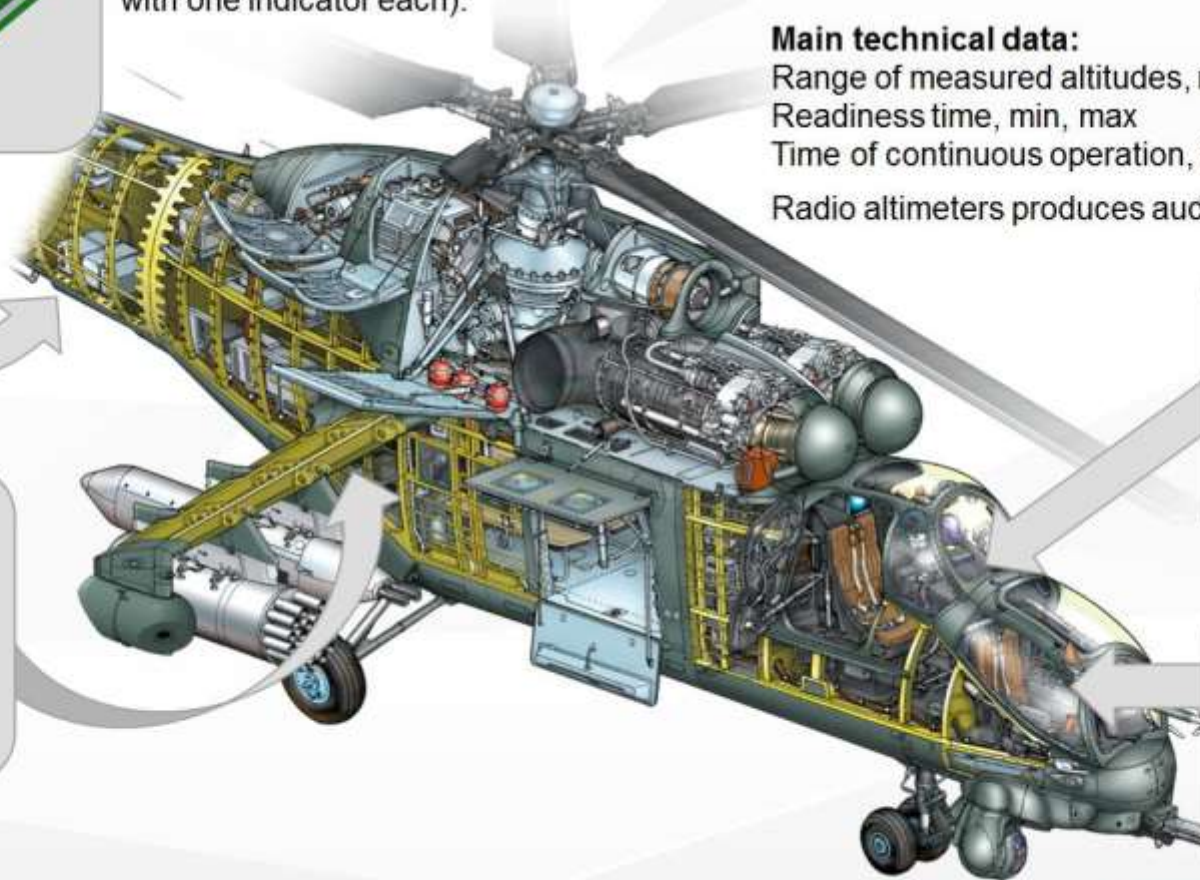
Transceiver



Altitude indicator



Altitude indicator



RADIO AND ELECTRONIC EQUIPMENT

ARK-35-1 AUTOMATIC DIRECTION FINDER

ARK-35-1 automatic direction finder is designed for navigation purposes based broadcasting radio stations and enables solution of the following navigation tasks:

- Flight to and from radio station and provision of visual indication of course angle;
- Automatic determination of bearing to radio station;
- Continuous measuring of course angle of radio station

MAIN CHARACTERISTICS:

- Operation frequency band 150 to 1750 kHz with tuning discretion 0,5 kHz and frequency of distress signal – 2182 kHz.
- Recording, storage and in-flight prompt selection of up to 20 values of frequency tuning. Time of data storage in case of de-energizing – 2000 hours.
- time of retuning from one frequency to another within operation frequency band – max 2 sec.
- Operational range at altitude 1000 m – not less than 180 km.



Receiver



Antenna unit



Control panel

RADIO AND ELECTRONIC EQUIPMENT

SVR-BM VIDEO RECORDING SYSTEM



Video recording system is designed for in-flight recording of video, audio and communication data in order to subsequently carry out computer-based testing and post-flight analyzing of data of combat application done by the pilot..

Number of recording channels... 6.
Time of recording ... not more than 2 hours.



BNV-3 Video data storage device



TV camera

1-ST LEVEL OPTION

- GEO-ONV1-01M night vision goggles



- UV-26M flare dispenser



Control panel



Switch box



Dispense units



Control box

- 4280MSE-01 IFF transponder



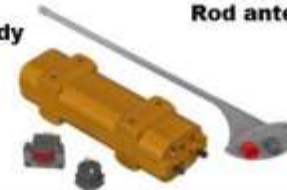
Antenna unit



Receiver-transponder

- S406-2NM emergency radio beacon

Beacon body



Rod antenna

- RT-600 SAR DF-517A (RT-600A NVG)
Wide-range aircraft direction finder

Antenna unit



Command unit



1-ST LEVEL OPTION

GEO-ONV1-01M NIGHT VISION GOGGLES

NVG is intended for observing the external environment on terrain when flying the helicopter at night in conditions of natural night illumination from 5×10^{-3} to 1 lx. NVG is a binocular passive optical-electronic device made on III-generation electronic-optical converters.

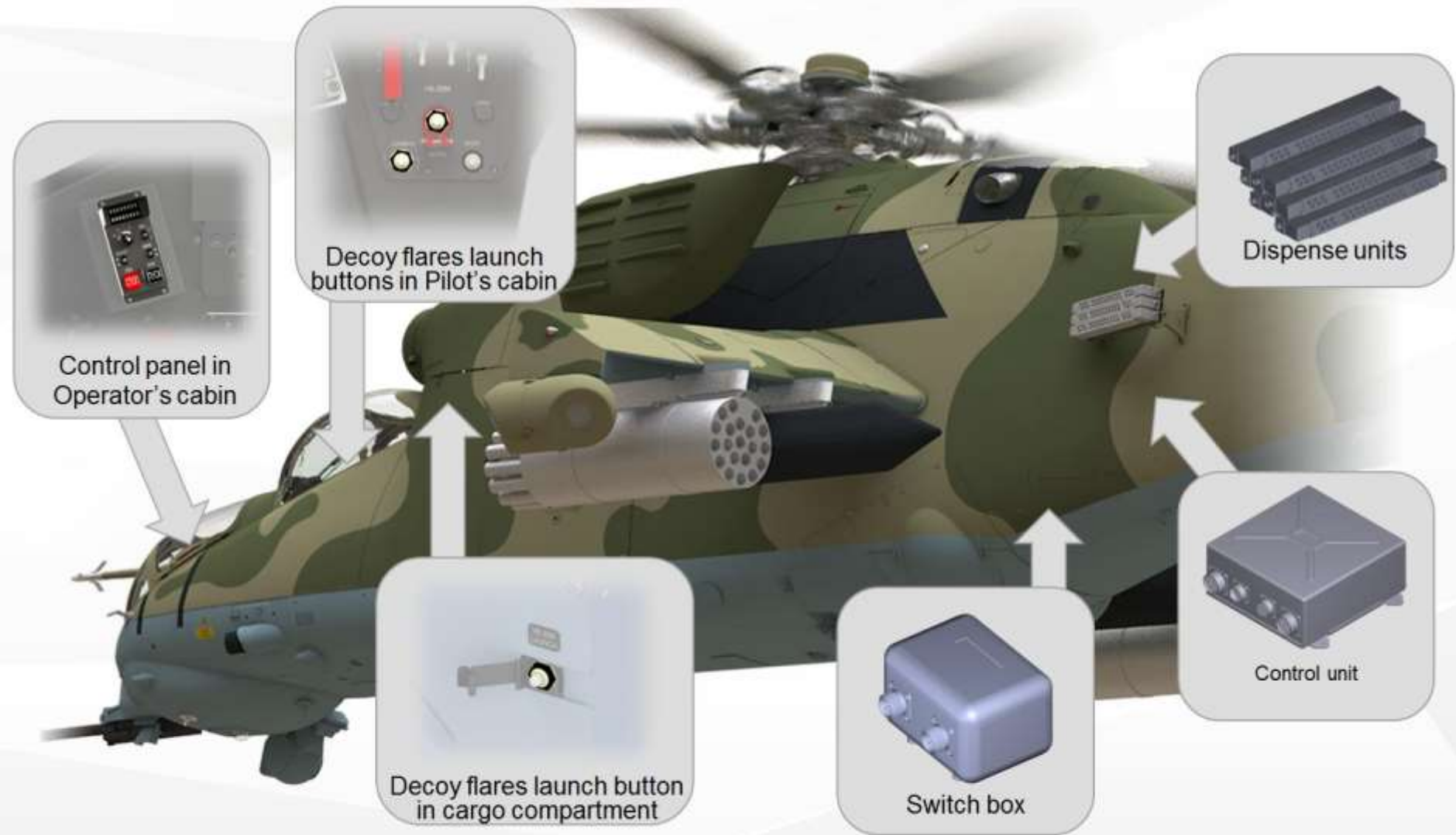
NVG PROVIDE THE FOLLOWING:



- 1 Helicopter takeoff and landing at night from unequipped and unlit sites;
- 2 Objects detection of power lines masts, tree, armoured vehicle, forest area outline etc.;
- 3 flights at extremely low altitude;
- 4 search of targets and objects on ground and water surface;

1-ST LEVEL OPTION

UV-26M FLARE DISPENSER



1-ST LEVEL OPTION

UV-26M FLARE DISPENSER

MAIN CHARACTERISTICS :

Caliber of loaded flare-cartridges, mm	26
Maximum number of flare-cartridges in dispense unit, pc.	192
Indication of remaining flare-cartridges	Accuracy up to 1
Number of pre-programmed and in-flight selected programmes	8
Time of nonvolatile storage of data about current number of flare-cartridges, days	30
Indication of data of current number of flare-cartridges	On control panel
Time of speeded dispense of the complete set of flare-cartridges, s	Not more than 1,2
Operation mode	manually— selection of dispense programme, dispense from star board or port side is initiated by the operator manually. Selection of dispense programme is done from the control panel by pressing the number of a dispense programme from those which have been preliminary recorded in the memory unit.

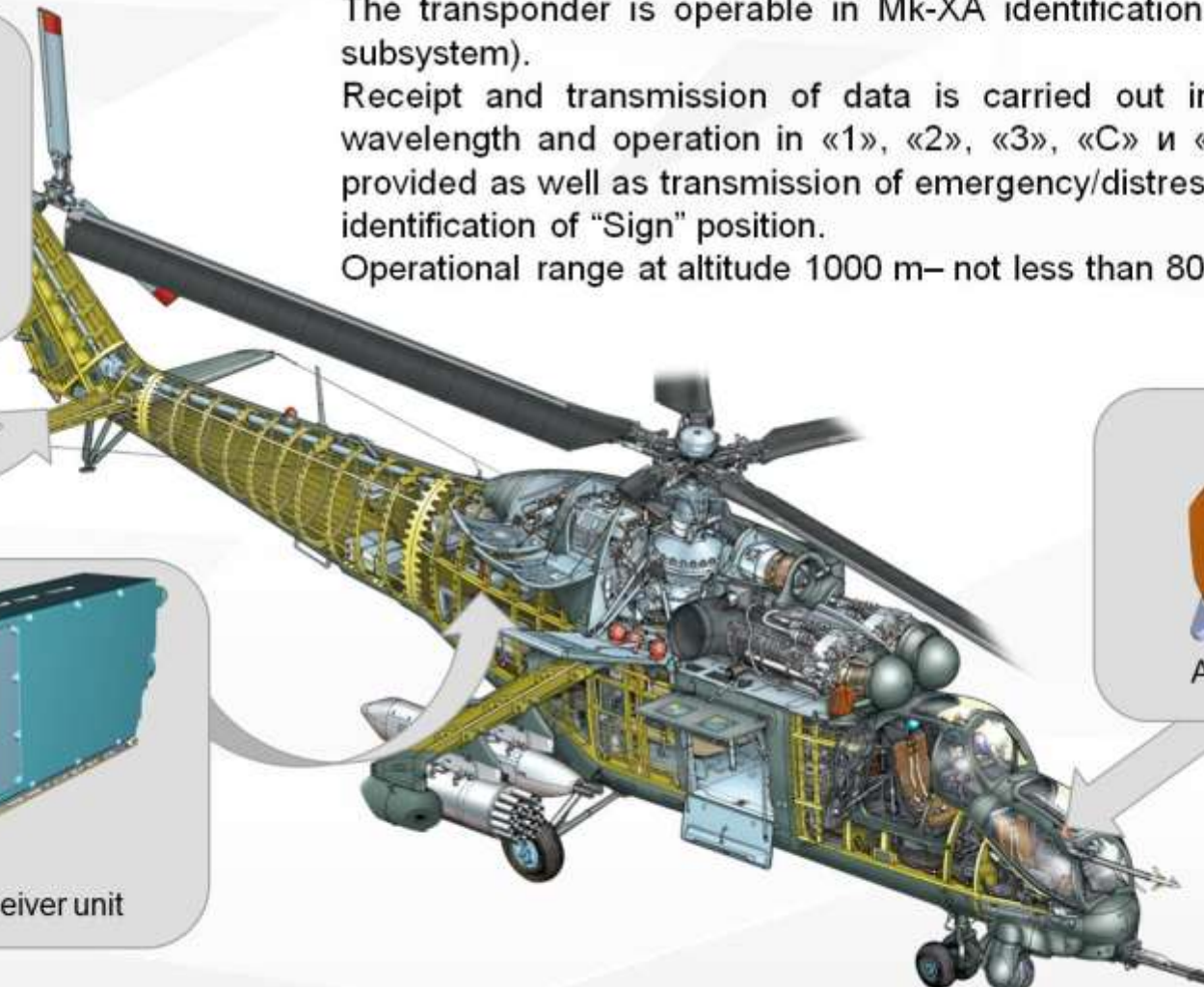
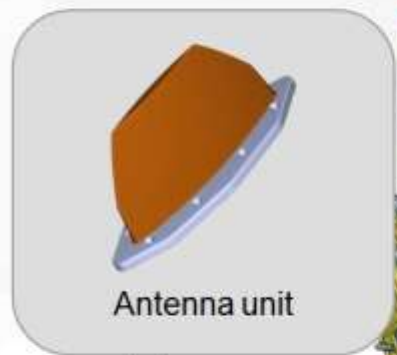
1-ST LEVEL OPTION

4280MSE-01 IFF TRANSPONDER

The transponder is operable in Mk-XA identification system (IFF subsystem).

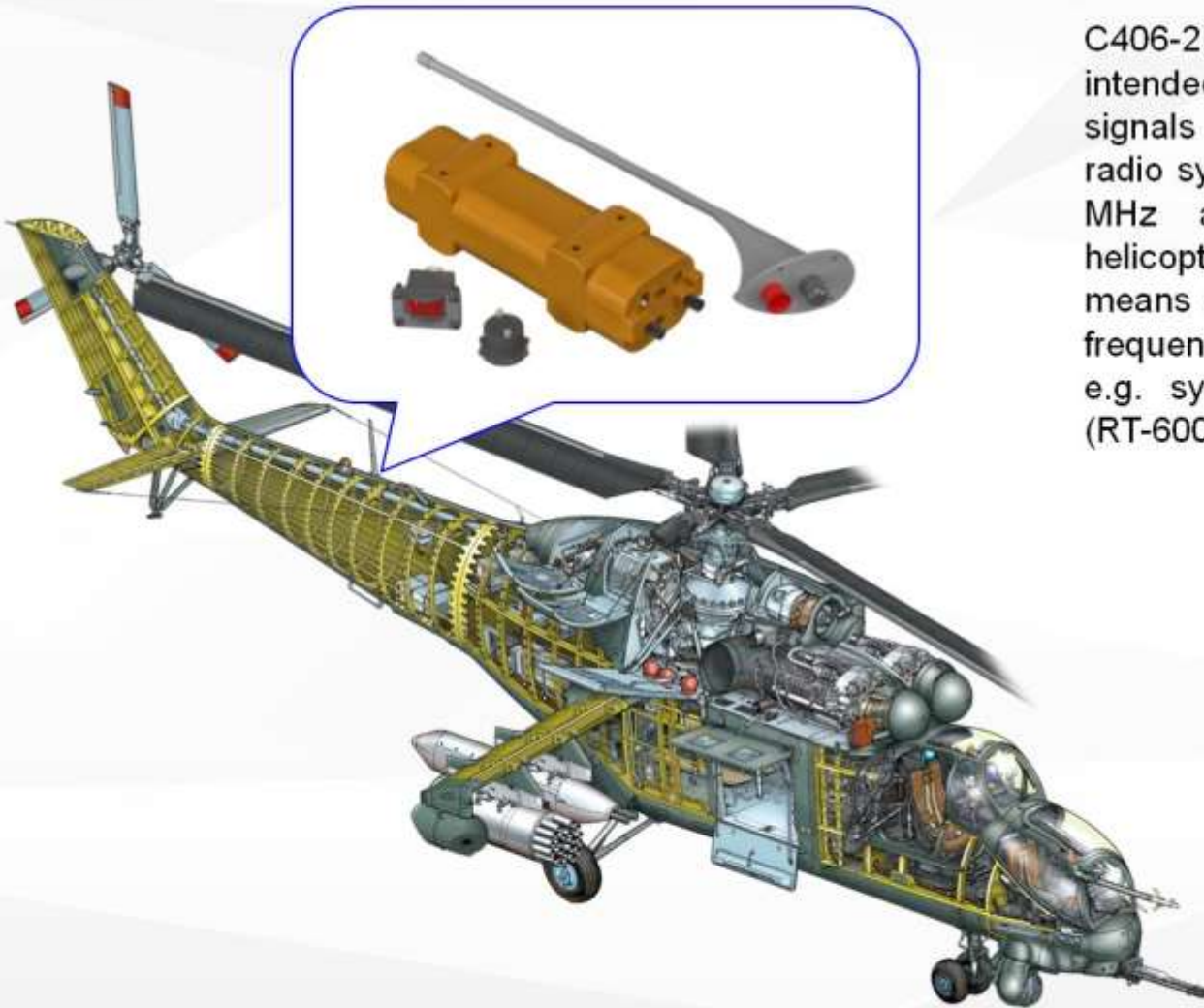
Receipt and transmission of data is carried out in D-range of wavelength and operation in «1», «2», «3», «C» и «S» modes is provided as well as transmission of emergency/distress signals and identification of "Sign" position.

Operational range at altitude 1000 m– not less than 80 km



1-ST LEVEL OPTION

C406-2HM EMERGENCY RADIO BEACON



C406-2HM emergency radio beacon is intended for transmitting distress signals for COSPAS-SARSAT space radio system on frequency of 406,025 MHz and taking bearing of the helicopter crash site by radio signals by means of direction finders operating on frequencies 121.5 and 243.0 MHz. (for e.g. systems RT-600 SAR DF-517A (RT-600A NVG))

1-ST LEVEL OPTION

RT-600 SAR DF-517A (RT-600A NVG) WIDE-RANGE AIRCRAFT DIRECTION FINDER



Intended for homing reconnaissance helicopters to objects equipped with UHF emergency radio stations (radio beacons). It provides a possibility to take bearing and analyze emergency frequencies in UHF and VHF band, common calling channel No.16 (naval communication) and common emergency signal of COSPAS/SARSAT.

UPGRADED MI-35P HELICOPTER IS EQUIPPED WITH ALL THE NECESSARY STATE-OF-THE-ART TECHNICAL AIDS, EQUIPMENT AND SYSTEMS REQUIRED FOR ACCOMPLISHMENT OF ITS MISSIONS DAY AND NIGHT



- **NIGHT APPLICATION**
- **GLASS COCKPIT**
- **OPTIMIZED WEAPONRY COMPOSITION**
- **DIGITAL AUTOPILOT SYSTEM**
- **DIGITAL COMMUNICATION SYSTEM**
- **THE BEST CRITERIA "EFFECTIVENESS-COST»**