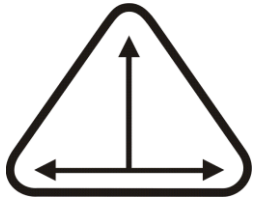
NITI – MINI UNMANNED AIR VEHICLE



BULCOMERS KS Ltd

Unmanned air vehicle, model NITI

- The NITI (UAV) was designed in 2006 by a team of Bulgarian experts with considerable skill in design and construction of multi-use UAV's.
- This NITI (UAV) possesses excellent aero dynamic design making it a highly durable and reliable. It maintains stability during climatic extremes. The NITI features long range distance and prolonged flight duration capacity.
- The modified wing span design adds increased degrees of airspeed and altitude. A variety of engines are easily installed into the NITI (UAV) to match the mission.
- NITI (UAV) is composed of a unique composite materials reinforced by aircraft carbon fiber.
- Survivability overload reaches a maximum of up to 8 g.
- NITI (UAV) unique aero dynamic design, wing span, and variety of engine fittings makes it a highly effective and reliable tool of any long range aerial surveillance arsenal.
- NITI (UAV) offers easy field maintenance and assembly.

NITI – Technical parameters

- Wing span – 5.38 m
- Total length – 3 m
- Height – 0.55 m
- Maximum take off weight – 70 kg
- Normal cargo weight – 10 kg
- Maximum cargo weight – 15 kg
- Cruise speed – 120 km/h
- Total flight distance – up to 500 km
- Take off speed – 80 km/h
- Maximum time in the air - 20 h
- Minimum operational air temperature – 20 ^{O}C
- Maximum operational air temperature + 50 ^{O}C

NITI - Applications

- **NITI provides real time aerial surveillance aiding border security teams.**
- **NITI assist in the security of conventional and nuclear power plants.**
- **NITI provides forward deployment aerial surveillance assisting force security.**
- **NITI systems assist in covert aerial search and destroy operations identifying both mobile and stationary targets.**
- **NITI systems aid in the location of fires, chemical spills, toxic environments or situations too dangerous for personnel observation, permitting surveillance by command and control at a remote location.**
- **NITI is especially effective in toxic environments too dangerous for ground team surveillance where aerial surveillance is optimum for remote viewing evaluation.**

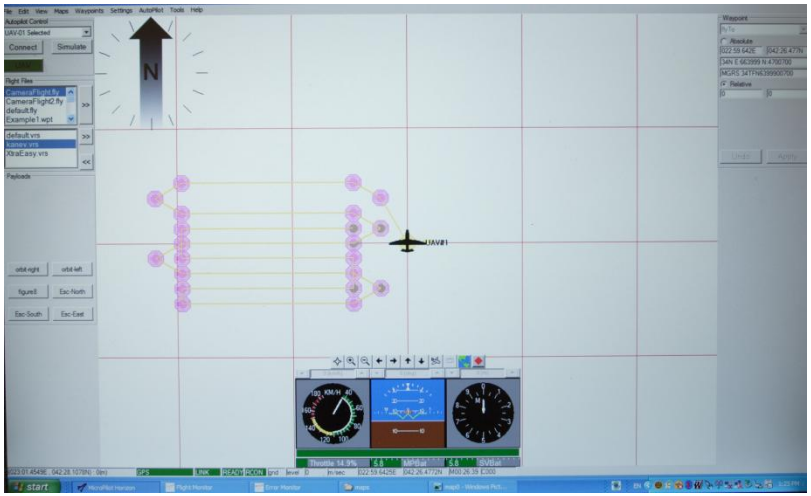
NITI - Applications

- Aerial air traffic control operations.
- Search and rescue operations during emergencies and natural disasters, to include downed aircraft or lost sea vessels
- Remote observation for determining medical intelligence and treatment required at inaccessible emergency or disaster zones.
- Security team observations of strategic points - radiation measurement and control at Nuclear Power Plant facilities.
- Disaster zone and emergency area remote view damage evaluations and assessments.
- Remote view observations of forestry and crop protection for fire prevention and early warning alerts in the detection of fires.
- Topographic scanning and mapping.
- Eco-monitoring – Early warning, detection, and Identification of chemical and radioactive agents, spills, pollutants or ecological disasters or emergencies.

NITI – Propeller and engine group

- Engine name – Model 3W Modelmotoren Co - 56 cm^3, 106 cm^3 , 157 cm^3.
- Engine resource up to 3000 h.
- Optimized technical features
- Electronic ignition.
- Low petrol consumption.
- Two stroke petrol engine.
- Quite operation.
- The NITI (UAV) can be equipped with a variety of propellers sizes to fit the engine type, flight duration, and mission type.

The NITI Avionics



- Altitude hold, airspeed hold and GPS waypoint navigation;
- 1000 programmable waypoints of the route plan;
- Command set provides flexibility when planning the mission;
- Fully integrated – all sensors required for complete airframe stabilization are integrated into single circuit board;
- Controls up to 24 servos or relays;
- Complete autonomous operation from launch to recovery;
- Flight modes: manually operated & autonomous;

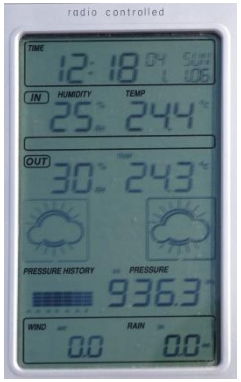
The NITI Avionics

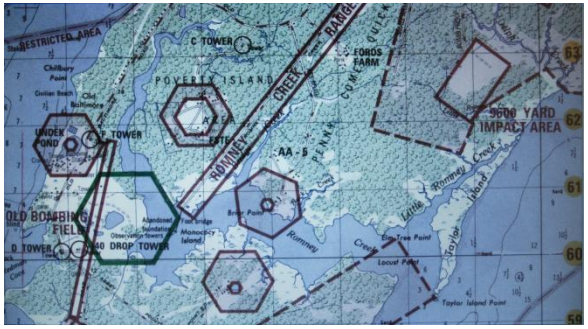
- Detailed flight data onboard saving simplifies post flight diagnostics & analysis;
- Transponder;
- Low battery warning on the ground and in flight;
- Use of the ready algorithms for detecting the loss of GPS signal, loss of RC signal, engine failure, loss of data link and low battery voltage;
- Feedback loop gains are adjustable during the flight;
- Digital recorder – storage of flight data & video information;

The NITI ground control system

- Telemetry receiver (video information);
- Manual control system;
- Lifted aerials;
- PC configuration;
- Electro-generator;

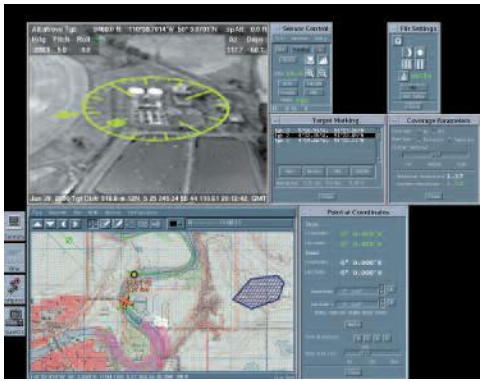
The NITI ground control system





- Meteorological station;
- Wind-cone;
- System for video and infrared camera control;

NITI Video camera

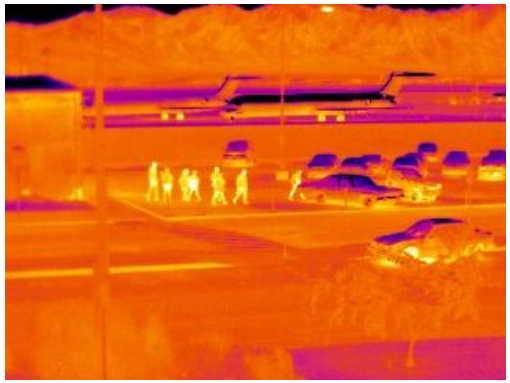


- The cameras are Infra- Red, high resolution stream in day or night mode;
- The camera is mounted on a gyrostabilised platform, that permits it to transmit the video signal with high quality and free of oscillations;

Technical parameters:

- TV lines:…….....520
- Optic zoom:…….....36 x
- Digital zoom:…….....12 x
- Light-sensibility: ……0,05 Lux
- Sizes:.....50,0 x 57,5 x 87,9 mm.
- Weight:.....230 g
- Total weight.....1000 g

NITI Infrared camera

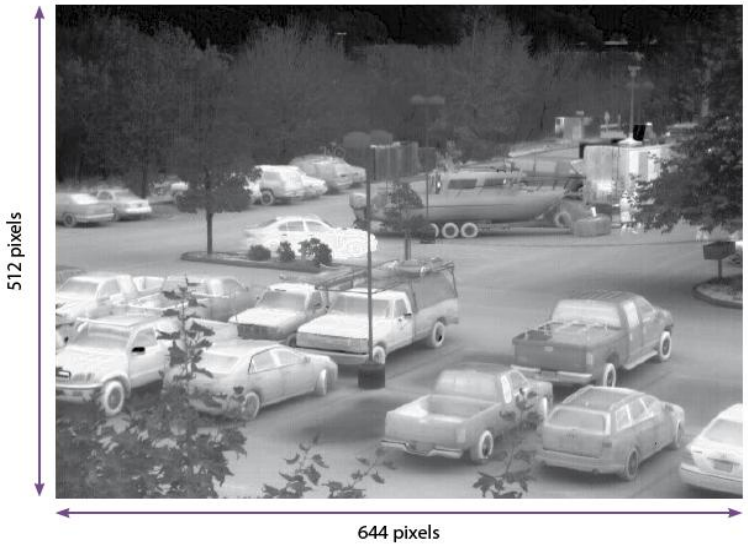


- The camera is mounted on a gyrostabilized platform, which allows it to transmit the video signal with high quality free of oscillations.

Technical parameters:

- Spectral scope:…….....8μm-14μm
- Matrix sizes:…….....640 x 512
- Pixels:…….....25μm
- Number of pixels:…….. …….307,200
- Digital zoom:…….x 2 x 4 x 8 x 16
- Weight:.....1150 g

NITI Infrared camera



Depends on the customer requirements it could be mounted different cameras and different lenses which makes the system very flexible. For example, on the infrared camera it is possible to mount lenses with the sizes as follow: 21,5 mm, 25 mm,

35 mm, 49 mm, 50 mm, 60 mm and 100 mm

“NITI” – HIGH DEFINITION COLOUR CAMERA

- The camera is mounted on a gyrostabilized platform, which allows it to transmit the video signal with high quality free of oscillations.

Technical specification:

- Effective pixels:…….....2,000,000
- Optical zoom:…….....10 x
- Digital zoom:…….....12 x
- Minimum illumination.…….1,0 Lux
- Sizes:…….....47,2 x 43,1 x 72,2 mm
- Weight:.....120 g
- Total weight.....970 g

“NITI” – monochrome camera

- Very good minimum illumination, resolution and sensitivity even in a big value of contrast
- The camera is mounted on a gyrostabilised platform, that permits it to transmit the video signal with high quality and free of oscillations

Technical specification

- TV lines:…….....570
- Effective pixels:…….....380 к
- Vari-focal length and video auto iris 10 -80 mm
- Minimum illumination.….0,00002 Lux
- Sizes:…….....34,0 x 34,0 x 45,0 mm
- Weight:.....150 g
- Total weight.....870 g

Transmission and receiving of video information

- Transmission of video information from the NITI (UAV) is in real time by means of video-receiver – permitting flight distance up to 60 km by the ground control post; and by satellite - for flight distance up to a maximum of 500 km;
- It is possible to transmit video information from 4 cameras to ground control monitors simultaneously;
- All the information is saved in the onboard computer for analysis after the mission operation is concluded;
- The video information transmitted to the ground control station is in real time. The information is recorded onto hard disk or DVD disk for storage and retrieval.

NITI take off and landing

Three methods of the UAV launch and landing approaches:

- By catapult (with or without landing gear).
- From a trolley, which remains on the land after launch.
- With landing gear, which can be installed and removed easily.

Landing can be made:

- On landing gear, when it is mounted or,
- On slides, which permit the landing to be made on any kind of flat surfaces (air-strip, tarmac, grass, snow, mud etc.).

NITI transportation

- NITI (UAV) is easily transported – by mini-bus or a truck with capacity of 15 m^3, where the ground control station is installed;
- It is transportable to the mission area of operation;
- 7 - 10 min flight preparation for catapult launch and 15 - 18 min launch time preparation with a catapult;

NITI – MINI UNMANNED AIR VEHICLE

BULCOMERS KS Ltd

1407 Sofia, Bulgaria, 26 Rilski ezera Street, 2nd floor, ap. 4
tel.:(+359) 2 444 40 35, fax.: (+359) 2 868 39 51
e-mail: bulcomersks@gmail.com