



THORON

S Y S T E M S

A Technology branch of Eudor JSC

DRONES

ORVILLE | 

WILBUR | 





A Technology branch of Eudor JSC

THORON SYSTEMS is a high-tech company based in Tbilisi, Georgia, that specializes in project development for unmanned aerial applications and vulnerable critical infrastructure protection.

Its activities range from unmanned border surveillance to protection against attacks by unmanned aircraft on critical civil infrastructure such as nuclear power stations, oil refineries or military infrastructure.

In addition, THORON SYSTEMS offers consultancy and advice for specific projects, being able to design particular platforms for any customer's need.





A Technology branch of Eudor JSC

ACRONYMS

UAV: Unmanned Aerial Vehicle.

IA: Artificial Intelligence.

JAMES: Fleet of drones also known as multi-UAVs.

HD: High definition.

IEC: IEC 60529 regulation that establishes how to classify the degrees of protection provided by the containers that protect electrical materials.

AES-256: Advanced Encryption Standard (AES) is one of the most widely used and secure encryption algorithms available today.

STANAG 4609: NATO's digital motion picture standard

VTOL: Vertical takeoff and landing drone.

PX4: Open source flight control software for drones and other unmanned vehicles





THORON SYSTEMS DRONES

THORON SYSTEMS presents WILBUR and ORVILLE, two models of UAV (Unmanned Aerial Vehicle) drones, specialized and prepared for protection, surveillance and identification tasks.

Both drones are equipped with camera and ground station that can be configured according to the needs, tasks and/or missions to be fulfilled.



APLICACIONES FOR WHICH THE UAV WILBUR AND ORVILLE DRONES WERE DESIGNED

- Border surveillance: identification of persons and/or vehicles.
- Surveillance of government facilities: ministries, barracks, powder kegs, ports, airports.
- Surveillance of industrial installations: oil refineries, thermal installations, nuclear centres, dams, mines.
- Protection of military operations: locating weapons, mine protection, locating submarines on the surface, identifying and locating military convoys, protecting military deployments of soldiers or vehicles.
- Protection of police operations: identification of asses, location of drugs, location of weapons, location of bodies...
- Identification and monitoring of fires.
- Goods transport protection.



CHARACTERISTICS OF THE UAV WILBUR AND ORVILLE DRONES

a. UAV Drone control

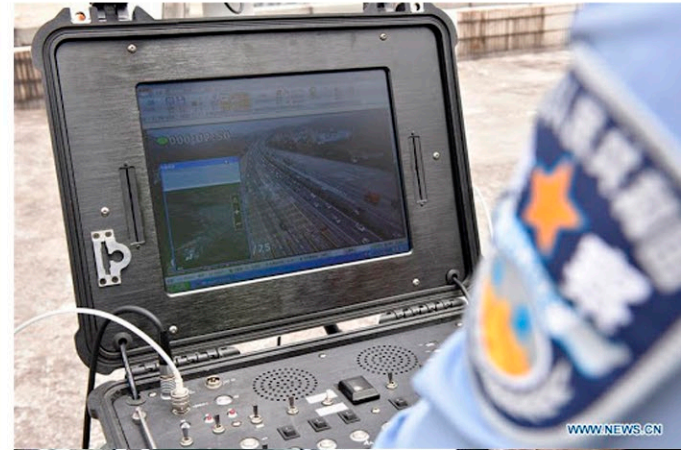
The UAV Drones are unmanned aircraft, designed for multiple civil or military applications of surveillance, protection and identification.

The UAV Drones have two control options, one operated by a remote pilot and the other by an AI system, an artificial intelligence software, where the human factor does not intervene.

This type of flight controlled by an AI-based system allows to perform tasks totally autonomously, exceeding the limits of other alternatives assisted by human pilots.

The following list lists the capabilities of the drones in flight:

1. Verification of the status of the aircraft.
2. Connect to the flight controller.
3. Obtain flight data from the controller.
4. Get signal and communications.
5. Check status of autonomous flight and its safety.
6. Control and autonomously determine the next movement of the aircraft.
7. Send flight commands to the controller.
8. Record the flight.





CHARACTERISTICS OF THE WILBUR AND ORVILLE DRONES

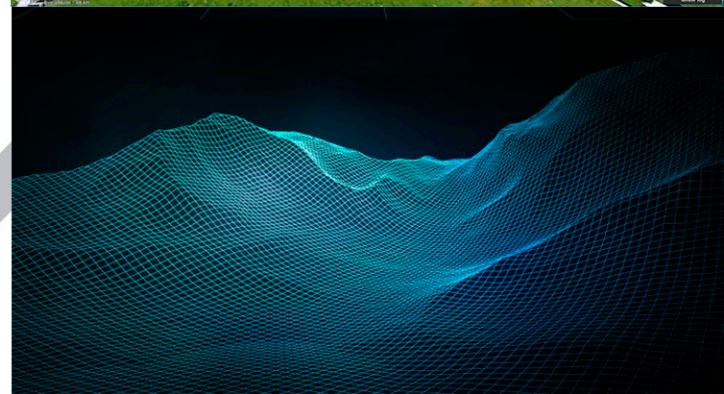
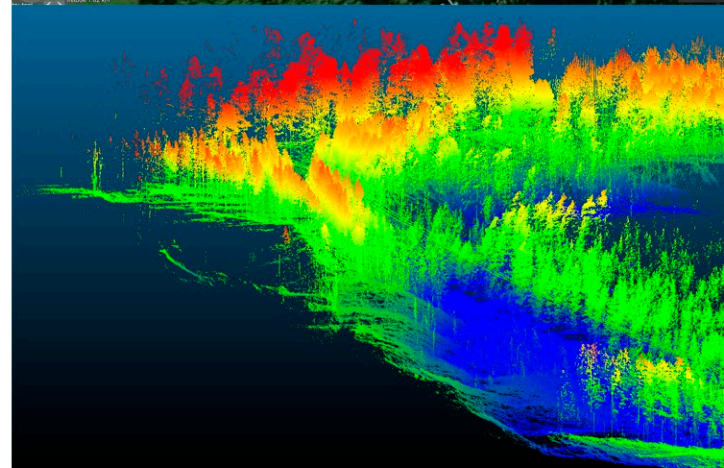
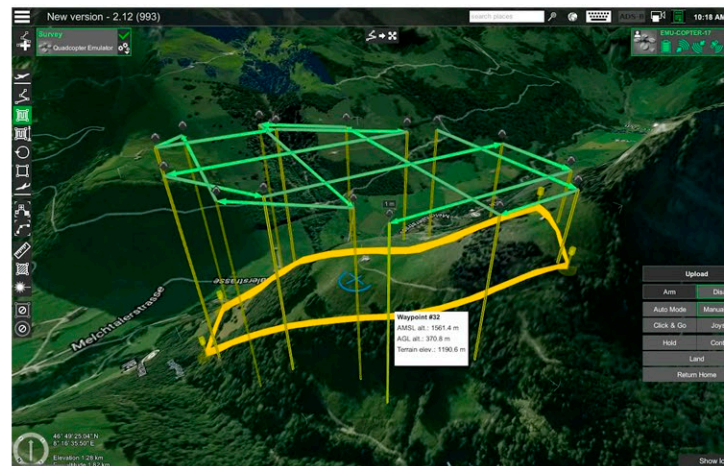
b. AI Artificial Intelligence for UAV Drones

The use of AI technology is present in all Thoron Systems models.

Thanks to this technology and in combination with the sensors incorporated to the system, dynamic and autonomous flights are allowed, interacting with weather conditions and the orography of the terrain. In this way AI allows to increase the safety of the aircraft, optimize fuel and ensure the success of the missions.

Another important factor using AI are swarms. The system is able to manage several drones simultaneously, but controlled as a single one.

The swarm mode allows access to more complex protection, surveillance and identification tasks, establishing ranges of larger territories, controlled by a single operator.





WILBUR | 

WILBUR MODEL

Wilbur models are heavy-duty, high-performance VTOL drones. Their wingspan is from 2 to 6 meters, and they have four powerful and reliable VTOL engines. The VTOL engines are double cylinder combustion engines with an optional 500 generator, advanced avionics and power distribution.

WILBUR





DRONES THORON SYSTEMS

WILBUR



WILBUR MODEL

Wilbur was designed for a large number of tasks thanks to its payload capacity, its operability under extreme climatic conditions and its autonomy. This enables to capture higher quality data:

Thanks to their payload capacity they can be coupled from high resolution mapping systems to advanced surveillance EO/IR cameras with object tracking, thermographic images, laser or others.

The Wilbur fuselage features an advanced aerodynamic design with the concept of a hybrid fixed wing consisting of a quadcopter component for VTOL.

Wilbur uses VTOL electricity and gasoline for fixed-wing propulsion, achieving a range of 20 hours of service and 1800 km of flight autonomy.





CHARACTERISTICS TABLE WILBUR MODEL

	W6-100	W6-150	W3-420	W2-550
Wingspan	6000 mm		3000 mm	2000 mm
Length	4712 mm		2300 mm	1562 mm
Height (Pawn)	650 mm		525 mm	351 mm
Maximum load	7 kg	3 Kg	1.5 kg	0,5 kg
Speed	90 Km/h	115 Km/h	72 Km/h	
Flight height	4877 m		3962 m	3048 m
Vertical take-off time (VTOL)	3 min			
Powered flight time	20 Horas	16 Horas	12 horas	6 horas
Working temperatures	-10° C to +50° C			
Motorizations	T-Motor U15 II		T-Motor U7	T-Motor MN501
CV motor	100 CV	150 CV	420 CV	550 CV
ESC	T-Motor 180A FOC		T-Motor 80A Flame	T-Motor 60A
Batteries	12 x 16000mAh 4S Lipo		2 x 9000mAh 4S Lipo	2 x 3800mAh 4S Lipo



ORVILLE MODEL

The ORVILLE model is a small-sized unmanned aerial vehicle (UAV) with a vertical take-off and landing system (VTOL) measuring 2.32 m long, 0.7 m wide and 0.92 m high.

ORVILLE



ORVILLE | 

ORVILLE MODEL

The ORVILLE model is equipped with a double-rotor Flettner system with four blades and a high-performance jetA1 or diesel-powered turbine.

This configuration allows it to reach speeds of 72 km/h with an approximate consumption of 15L/h, reaching a service height of 3000m above sea level.

The ORVILLE has a main fuel tank of 13L, which gives it a flight range of approximately 2.5h. It can also be complemented with two other auxiliary tanks of 13L max.

The payload capacity of the ORVILLE model is 45 kg and it can incorporate a wide variety of cameras and optics.





CHARACTERISTICS TABLE ORVILLE MODEL

	O2-50
Long	2320 mm
Width	700 mm
Tall	920 mm
Maximum load	45 kg (fuel incluido)
Speed	72 Km/h
Flight height	3048 m
Powered flight time	3,1 horas
Working temperatures	-10° C to +50° C
Rotation system	Flettner double rotor system (4 blades)
Rotor diameter	2 x 2820 mm
Motor	High performance turbine

CAMERAS **Optical Systems**

It highlights the reliability, stability and load capacity of both Orville and Wilbur models and can be complemented with virtually any optical system on the market.

High resolution cameras as multispectral, thermographic, panchromatic ... a wide range of possibilities that we can incorporate into our drones depending on the needs of the mission.

CAMERAS

**SUBJECT
IDENTIFIED**

Panchromatic cameras are a fundamental source of information for terrain recognition, interpretation and basic analysis, tracking of moving vehicles.

Multi and hyperspectral cameras have sensors that measure light beyond the spectrum visible to the human eye. The value of these measurements is very useful, in the detection of anti-personnel mines, border protection or the detection and fight against drug trafficking.

Thermographic cameras base their operation on the detection and measurement of infrared radiation (heat) emitted by all bodies:

- The most common uses are in infrastructure inspection, thermal leak detection.
- Thermal sensors allow the detection of people quickly in places of difficult access.
- They are able to identify hot spots, even when the difference between the environment and the focus to be detected is a few degrees.
- For this reason, its services in security, disaster assistance and humanitarian rescue missions as well as in vehicle tracking are very interesting.

		Weight (g)	Reach (m)	Characteristics
VCT-1000		800	1000	Dual sensor thermal camera lens tracking, recording, gimbal guided by GPS HD
VCL-5000		2600	5000	360 camera lens tracking thermal built-in laser lighting HD GPS Gimbal
VCLD-5000		1600	5000	360 camera tracking lens built-in thermal laser lighting HD GPS Gimbal. Triple sensor double laser
VCL-200		1200	200	Laser mapping of indoor or underground objects Target Tracking, Recording, HD GPS Guided Gimbal

STATIONS

Terrestrial Stations

The UAV can communicate with the base through a communications subsystem sending flight data or information collected by sensors and cameras. On the other hand, from the ground station, a person can send data to the UAV, even when it is moving, and assign new instructions or flight plans.

In short, the UAV can be operated from the ground by a human operator, either according to a defined flight plan, or autonomously by AI.

The components of the terrestrial stations are of high quality, have networking, active cooling and integrated computer technology, all wrapped in a rugged suitcase.

With HD displays, integrated storage, integrated antenna connectors and AX ground station, this is an all-in-one flight and control station.

The stations consist of two independent antennas through which they receive graphic data and images and telemetry, respectively. The range is from 50 to 1500 km using frequencies ranging from 7 to 900 Ghz.

Also, it has a redundant security system of two antennas, if one is out of service, due to a fault or electronic inhibition, the secondary antenna will be automatically activated keeping the connection and data reception intact. In case of a failure or inhibition of both antennas the system would automatically connect to the 5G mobile network avoiding loss of control of the aircraft or data for the success of the mission.

All terrestrial stations are protected against electromagnetic pulses and microwaves , and comply with the IEC 60529-IP66W standard.

STATIONS



La seguridad de transmisión de datos entre los drones UAV y la emisora queda protegida por los sistemas de encriptación cifrada AES256 y STANAG 4609.

Las emisoras terrestres funcionan con corriente alterna de 125 y/o 220/240v y con baterías pudiendo operar con un funcionamiento fiable y continuo en zonas hostiles. Las baterías auxiliares de los emisores AX-110 y AX-500 se comportan al igual que un SAI interno conectándose automáticamente en caso de interrupción eléctrica.

Otra opción es optar por el empleo de baterías intercambiables de uso externo de carga rápida mediante paneles solares de 300W alto rendimiento utilizadas en la industria espacial.

Las emisoras disponen de climatización adaptada dependiendo de la zona de trabajo mayor de +60°C o menor -20°C

TERRESTRIAL STATIONS CHARACTERISTICS

	Standard Earth	Earth AX-100	Earth AX-110	Earth AX-500
				
Range (km)	50	100	250	1.500
Frequency (GHz)	2,4-7	10-17	900	900
Feeding				
Electric Network (V)	125 220-240	125 220-240	125 220-240	125 220-240
Batteries	Fixed	Fixed	Interchangeable	Interchangeable
Solar	Optional	Optional	300w foldable solar panel fast charge	300w foldable solar panel fast charge
Interchangeable Batteries	Optional	Optional	2 Units Series	2 Units Series
Communications				
GSM module	Optional	Optional	Serie	-----
GSM / SATi module	Optional	Optional	-----	Serie
Screens	1X12"	1X12"	1X19"	2X12"

SUMMARY OF ADVANTAGES AND BENEFITS OF THE WILBUR AND ORVILLE MODELS

Aircraft designed for 24-hour day or night-time operation in a wide variety of applications and environments

Autonomous piloting functionality without human intervention, option of real time decision making to complete mission or modification of mission

Carrying out missions in swarm mode is possible in order to increase the scope of the mission with the same number of resources:

- Autonomous take-off and landing system
- Fixed position maintenance
- Payload control
- Automatic return to the launch point
- Real-time planning of route alternatives using AI for safe flight control

Ideal equipment for high-risk missions that require quick decisions and scenarios with the probability of aircraft connection interruption.

Varied payload capacity high resolution mapping, photogrammetry, advanced dual-sensor surveillance cameras, high quality multispectral systems, etc.

Investment savings of up to 90% in price compared to manned and armed helicopters performing similar surveillance, identification and reconnaissance activities

For more information or advice on specific projects and applications Thoron Systems has qualified personnel in many sectors, ask us without obligation.

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