

MILITARY PRODUCTS



● **OVERVIEW OF VIETTEL GROUP**

● **GENERAL INTRODUCTION**

1. Radar
2. Electronic warfare
3. Optronics
4. Unmanned aerial vehicle
5. Military communications
6. Command and control system
7. Modeling & simulation
8. Military computers
9. Cyber security



Established on June 1st, 1989, at present, Viettel Group is the largest telecommunications, industrial and technology enterprise in Vietnam, one of the enterprises with revenue, profits, paying taxes and contributing to the State budget is the largest in Vietnam.

Defining the mission of Caring Innovator, Viettel associates business activities with the goal of contributing to the sustainable prosperity of society.

Viettel’s activities have gone beyond the national territory, becoming one of the most valuable global brands, with nearly 50,000 employees engaged in business activities in 11 countries spanning 3 continents, indirectly create jobs for tens of thousands of people.

As the core of the high-tech defense industry complex, Viettel has mastered important core technologies in the electronics and telecommunications industry, the cybersecurity industry, and the hightech defense industry.

In the new development phase, Viettel has determined for itself the mission of Pioneering to create a digital society with the goal of applying the results of digital transformation to help people’s lives become better.

#1 Most valuable brands in Vietnam

#18 Most valuable telecommunications brands in the world

#1 Most valuable telecommunications brands in the Southeast Asia

#227 Most valuable brands in the world

FIELD OF ACTIVITIES



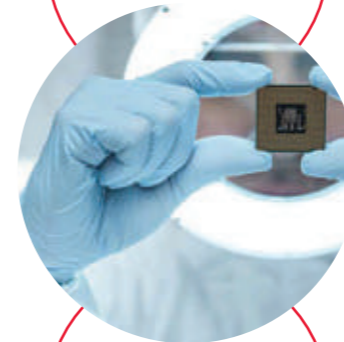
TELECOMMUNICATION

- Mobile services
- Television Services
- Internet services
- Telecom infrastructure design services



IT SOLUTIONS & DIGITAL SERVICES

- E-Government
- Digital economy
- Digital society
- Cyber security



HIGH-TECH R&D

- Hi-Tech Defense Industry
- Electronics & Telecommunication
- Civil Industry



LOGISTIC & E-COMMERCE

- Logistics Center
- Express Delivery
- Retailer & Distribution Telecom Equipment

OUTSTANDING NUMBER

8.76 Billion USD
BRAND VALUE

12.2 Billion USD
REVENUE

1.8 Billion USD
PROFIT

130 Million
GLOBAL CUSTOMERS

11 NATIONAL & TERRITORIES
ASIA, AFRICA, AMERICA

460 Million USD
SOCIAL RESPONSIBILITY



479 REGISTERED INTELLECTUAL PROPERTIES IN VIETNAM



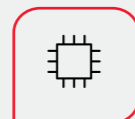
84 REGISTERED INTERNATIONAL INTELLECTUAL PROPERTIES



72 GRANTED PATENTS IN VIETNAM



15 GRANTED PATENTS IN THE USA



270 CORE TECHNOLOGIES

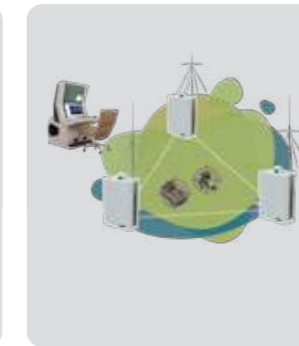
ECOSYSTEM OF MILITARY PRODUCTS



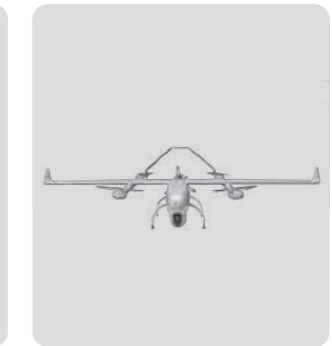
Radar



Optronics



Electronic warfare



UAV



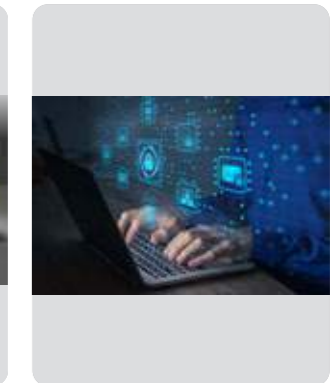
Communication



Command & Control stem



Model & Simulation



Computers and Cyber security

▶ GENERAL INTRODUCTION ABOUT **MILITARY PRODUCTS**

Viettel's Military products are being researched and developed according to the C5ISR combat model, a modern combat model applied in many countries have advanced military science in the world.

This combat model implements 04 main tasks:

- Collect information (Intelligence, Surveillance, Reconnaissance)
- Transfer information, command (Communication)
- Process information (Command, Control, Computer)
- Cyberspace combat (Cyber)

COLLECT INFORMATION

The first task of the C5ISR model is to Collect information. Currently, Viettel has 04 types of products that perform this task include: UAV, Radar, Optronics, Electronic-Warfare (EW).

Viettel has successfully developed 05 types of radars for Army, Air Defense, Air Force and Navy. These are wide-ranged of lines from 2D, 3D, mid-range, long range...

About Electronic-Warfare, Viettel has developed products to implement 3 tasks: Electronic reconnaissance, suppression and protection, works in wide range frequency to ensure the combat ability in modern combat environment.

Viettel has developed 06 types of Optronic products for the Army, Navy, Air Defense and Air Force, Border Guard to perform security monitoring, reconnaissance, target directives and firepower control missions. There are Optronic product lines such as thermal scouts, thermal scope for sniper, products for sea vessels and air force too.

Viettel has successfully researched the light UAV and is continuing to develop the medium UAV with different features and flight range to serve the different needs.

TRANSFER INFORMATION, COMMAND

In order for the aboved Information Collecting Systems can connect to each other and transmit or receive information, commands from the HQ, we need the communication systems. Currently, Viettel has successfully developed 16 categories of wire and wireless radio, resolving almost the requirements of military communication from strategic to tactical level, flexible for both soldiers and vehicles.

The most superior point that Viettel's military communication equipment is superior to the old models is they are developed on the SDR technology platform. This new technology allows the entire function of the machine built with software algorithms, so when it wants to upgrade or expand features just need to upgrade the software.

PROCESS INFORMATION (COMMAND, CONTROL, COMPUTER)

The third task of the C5ISR model is to Process the Information. On the basis of the information collected and exchanged, the entire situation on the battlefield will be built and analyzed by the third component and also the core center component in the C5ISR model. It is the Command and Control Automation System. This system is responsible for handling, analyzing situations and supporting the commander to make a quick decision. It is possible to understand that, instead of the commander must directly call for the battlefield situation, the availability of the fighting force and firepower, with this system, just a point on the computer screen, the commander can capture the entire situation, and are automatically given the response options to choose and issue an instant command, help to save a lot of human resources and time.

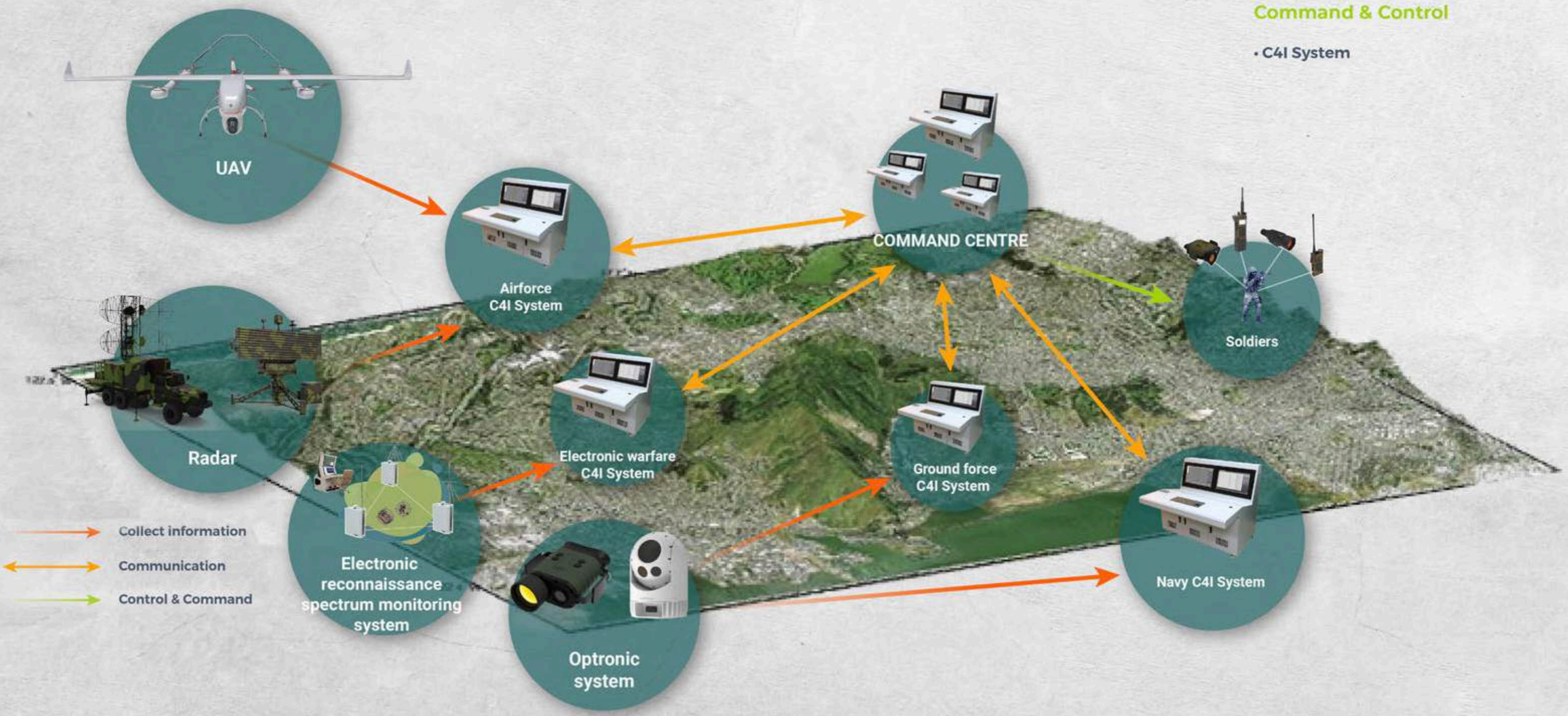
In order to improve the capacity, effectiveness of the army, Viettel is also researching and developing the simulation systems for training and use of equipment such as: Tank Crew Simulation, Aircraft Crew Simulation, Air Defense Simulation and EW Simulation...

Viettel Military Products are based on CSISR Model

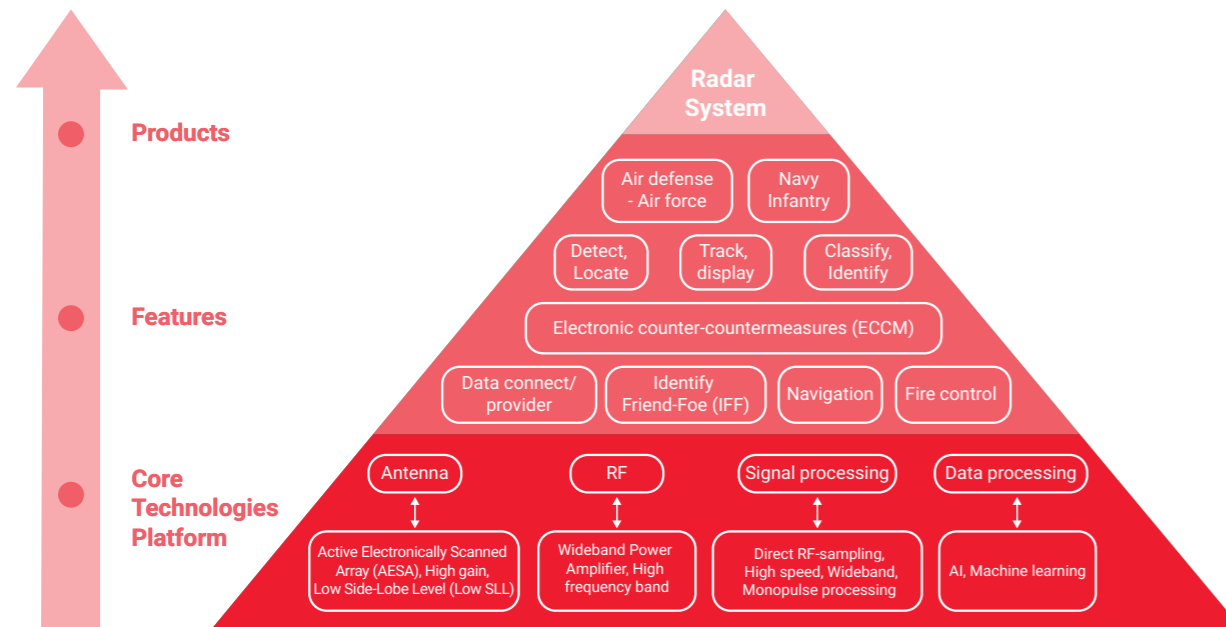
- 1**
- Intelligence, Surveillance, Reconnaissance**
- Radar
 - Optronics
 - UAV
 - Electronic Warfare

- 2**
- Communication**
- Military communication products

- 3**
- Command & Control**
- C4I System



► RADAR



Radar's Core Technologies Platform and Features

Viettel is a leading radar manufacturer in Vietnam and Southeast Asia. We offer a wide range of radar products for all defense sectors, including: air, ground and naval defense radars. With the modern research laboratory infrastructure and production lines, experienced engineers and scientists in the field of radars, our products have won prestigious awards and been granted exclusive patents for new applied technologies.

Nowaday warfares involve the variety of battlefronts and combat weapons. From threats in the air, at sea, on land and the explosion of unmanned vehicles such as UAVs, USVs... have completely changed the modern war situation. Viettel has been designing and manufacturing a variety of radars with different advanced technologies to defeat the rising threats, just to name a few: PESA/AESA technology, digital beamforming, direct high-frequency digitization, Pulse/FMCW, solid-state receiver/transmitter, ECCM technics, adaptive signal processing, multi target tracking, target recognition and classification...These are the world latest radar technologies and basic building blocks for the 4th, 5th radar generations, including surveillance and fire

indicator radar, fire control radars... These features improve situation awareness, battlefield awareness, and support quick decision-making in military combat use cases.

Viettel always guarantees the highest combat effectiveness with our radar products, thanks to the following outstanding features:

- **Smart:** simultaneously tracking thousands of targets with adaptive processing, built-in ECCM capabilities, and AI-based target recognition/classification.
- **High mobility:** from small portable radars to vehicle-based radars with automatic deployment/retrieval and system balancing capability.
- **Durability:** survive all different types of terrain and weather condition. Operation in harsh environments, sea and islands: resistant to steam, sea salt, high temperature.
- **24/7 operation:** scalable/upgradable systems with modular design which support hot-swap redundancy and 24/7 operation without interruption.

2D Air-Defense Surveillance Radar



MEDIUM-RANGE AIR-DEFENSE SURVEILLANCE RADAR



LOW-ALTITUDE AIR-DEFENSE SURVEILLANCE RADAR



X-BAND CRITICAL INFRASTRUCTURE PROTECTION RADAR

3D Air-Defense Surveillance Radar



3D S-BAND MEDIUM-RANGE AIR-DEFENSE SURVEILLANCE RADAR



3D S-BAND TACTICAL SURVEILLANCE RADAR



3D TACTICAL SURVEILLANCE RADAR

Coastal Surveillance Radar



X-BAND MOBILE COASTAL SURVEILLANCE RADAR

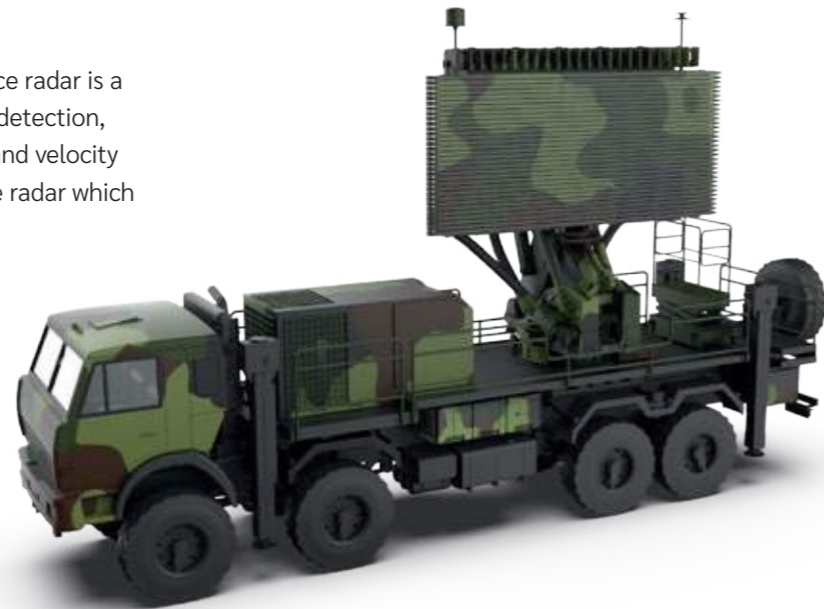


SHORT-RANGE HIGH RESOLUTION SURVEILLANCE RADAR

▶ 3D S-BAND MEDIUM-RANGE AIR-DEFENSE SURVEILLANCE RADAR

GENERAL INTRODUCTION

3D S-band medium-range air-defense surveillance radar is a highly mobile system with capabilities of target detection, coordinates location (range, azimuth, altitude) and velocity measurement. This is an air-defense surveillance radar which provide target's information for C4ISR systems.



KEY FEATURES

- Medium-range air defense
- Identify friend-or-foe with integrated Parol IFF system
- Target indication and support air-force navigation functionalities.
- Open interface for flexible connection to C4ISR systems.

SPECIFICATIONS

Operating frequency	S-Band
Coverage volume	
• Azimuth	360°
• Range	360 km
Scanning rate	Up to 12 rpm
Number of tracks	≥ 300
ECCM	Automatic Jammer monitoring & frequency selection
Installation	On vehicle
Deployment, retrieval time	≤ 20 minutes

3D S-BAND TACTICAL SURVEILLANCE RADAR ◀

GENERAL INTRODUCTION

3D S-band tactical surveillance radar is a three-dimensional short-range radar system with modular design. It can be deployed on complex or restricted terrain, since the deployment and transportation are highly portable.

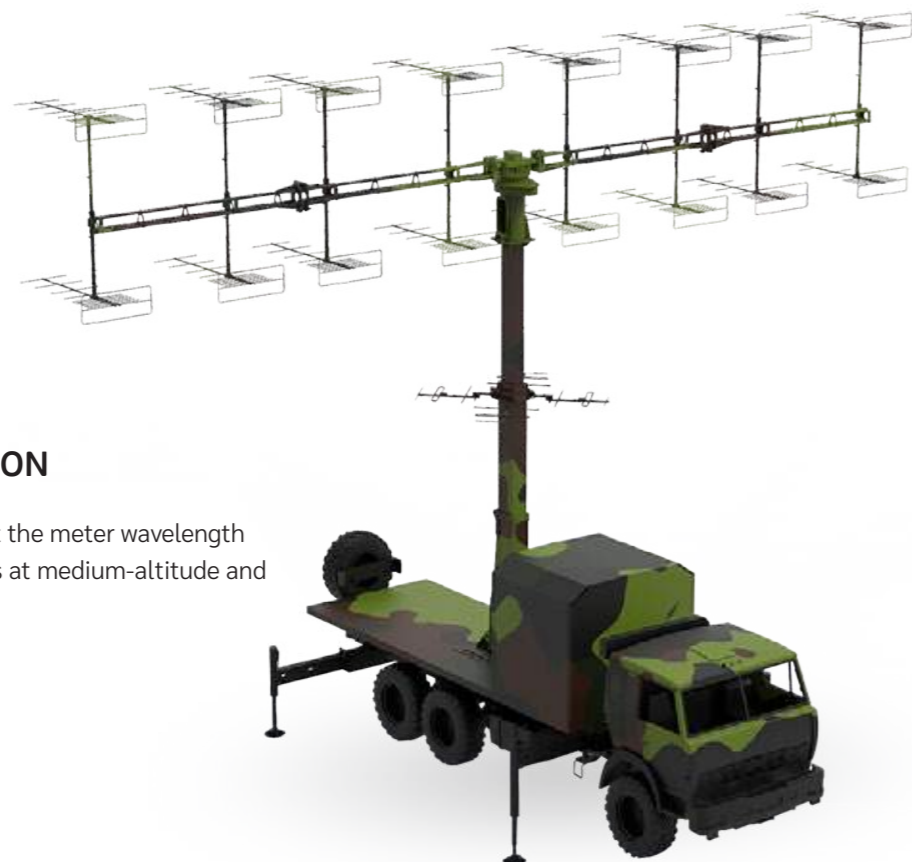


KEY FEATURES

- Short-range air defense.
- Detect and locate target in 3D space.
- Provide target's information: range, azimuth, altitude, speed and moving direction.
- Built-in ECCM capabilities.
- Provide target's information for C4ISR system.
- 24/7 operation.

SPECIFICATIONS

Operating frequency	S-Band
Coverage volume	
• Azimuth	360°
• Range	100 km
Scanning rate	Up to 12 rpm
Number of tracks	≥ 60
ECCM	Automatic Jammer monitoring & frequency selection
Installation	Portable with tripod
Deployment, retrieval time	≤ 30 minutes
24/7 operation	Yes



GENERAL INTRODUCTION

2D surveillance radar operating at the meter wavelength to detect and locate flying targets at medium-altitude and medium-range.

KEY FEATURES

- Surveillance, detection, tracking and determining of the coordinates, velocity of the medium-altitude flying targets.
- High mobility, easy deployment and retrieval operation.
- Built-in ECCM capabilities.
- Supplying target's information to C4ISR system or air defense missile system: azimuth, range, speed and moving direction.

SPECIFICATIONS

Operating frequency	VHF
Coverage volume	
• Azimuth	360°
• Range	360 km
Scanning rate	Up to 12 rpm
Number of tracks	≥ 200
ECCM	Automatic Jammer monitoring & frequency selection.
Installation	On vehicle.
Deployment, retrieval time	≤ 30 minutes



GENERAL INTRODUCTION

Three-coordinate (3D) radar operates in the L-band to detect and locate flying targets at low altitude and short range.

KEY FEATURES

- Surveillance, detection, tracking and determining of the coordinates, velocity of the low-altitude flying targets.
- High mobility, easy deployment and retrieval operation.
- Built-in ECCM capabilities.
- Supplying target's information to C4ISR system or air defense missile system: azimuth, range, speed and moving direction.
- 24/7 operation.

SPECIFICATIONS

Operating frequency	L-band
Coverage volume	
• Azimuth	360°
• Range	80 km
Scanning rate	Up to 24 rpm
Number of tracks	≥ 60
ECCM	Automatic Jammer monitoring & frequency selection.
24/7 operation	Yes.
Installation	Portable with tripod.
Deployment, retrieval time	≤ 30 minutes



GENERAL INTRODUCTION

2D surveillance radar operating at the decimeter wavelength to detect and locate flying targets at low altitude and medium range.

KEY FEATURES

- Surveillance, detection, tracking and determining of the coordinates, velocity of the low-altitude flying targets.
- Interoperability with Surface-to-Air weapon systems.
- High mobility, easy deployment and retrieval operation.
- Built-in ECCM capabilities.
- Supplying target's information to C4ISR system or air defense missile system: azimuth, range, speed and moving direction.

SPECIFICATIONS

Operating frequency	UHF
Coverage volume	
Azimuth	360°
Range	300 km
Scanning rate	Up to 12 rpm
Number of tracks	≥ 250
ECCM	Automatic Jammer monitoring & frequency selection.
Installation	On vehicle.
Deployment, retrieval time	≤ 10 minutes



GENERAL INTRODUCTION

Medium-range coastal surveillance radar operates at X-band to detect and locate surface targets on the sea and low-altitude air targets.

KEY FEATURES

- Detect and locate surface targets: ships, small boats, naval ships, low-altitude air targets...
- Supply target's information to C4ISR system: azimuth, range, speed and moving direction.
- Target analysis, recognition & classification supported.
- Built-in ECCM capabilities.
- Highly durable and stable 24/7 operation in harsh environment.

SPECIFICATIONS

Operating frequency	X-Band
Coverage volume	
• Azimuth	360°
• Range	100 NM
Scanning rate	6 rpm
Number of tracks	≥ 1000
ECCM	Automatic Jammer monitoring & frequency selection.
Target analysis recognition & classification	Yes
24/7 operation	Yes
Installation	On vehicle

▶ **SHORT-RANGE HIGH RESOLUTION SURVEILLANCE RADAR**



GENERAL INTRODUCTION

Short-range high resolution surveillance radar is a FMCW-technology-based system, which detects and locates surface targets on the sea. It's suitable for deployment on harbors, naval bases, rig-houses or small islands.

KEY FEATURES

- Detect and locate surface targets: ships, small boats, naval ships...
- Supply target's information to C4ISR system: azimuth, range, speed and moving direction.
- Target analysis, recognition & classification supported.
- Built-in ECCM capabilities.
- Highly durable and stable 24/7 operation in harsh environment.

SPECIFICATIONS

Operating frequency	X-Band
Coverage volume	
• Azimuth	360°
• Range	36 NM
Scanning rate	Up to 12 rpm
Number of tracks	≥ 300
ECCM	Automatic Jammer monitoring & frequency selection
Target analysis recognition & classification	Yes
24/7 operation	Yes
Installation	Fixed installation

X-BAND CRITICAL INFRASTRUCTURE PROTECTION RADAR ◀



GENERAL INTRODUCTION

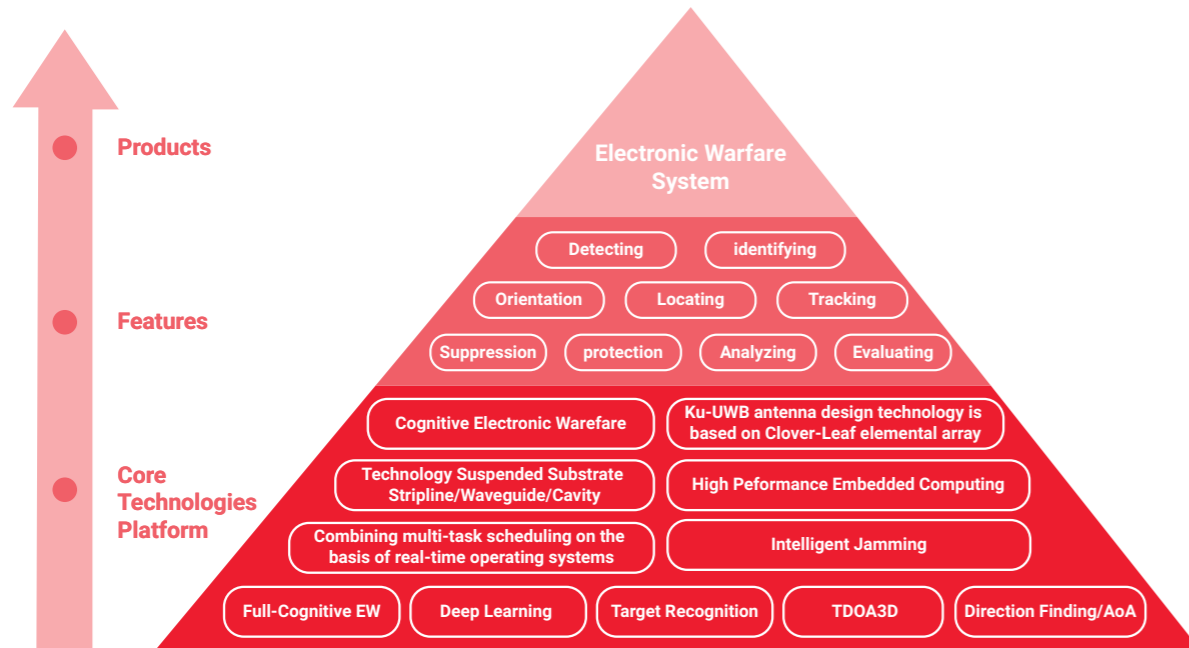
X-band critical infrastructure protection radar is a FMCW-technology-based system. Its missions are ground and low-air surveillance, which protect critical infrastructure: harbors, airports, borders...

KEY FEATURES

- Targets: UAV, drone, LSS targets, ground vehicle, ground targets...
- High scanning rate (60 rpm)
- Supply target's information to C4ISR system: azimuth, range, speed and moving direction.
- Target analysis, recognition & classification supported.
- Built-in ECCM capabilities.
- Small, light and highly portable system.
- 24/7 operation.

SPECIFICATIONS

Operating frequency	X-Band
Coverage volume	
• Azimuth	360°
• Range	12 km
Scanning rate	Up to 60 rpm
Number of tracks	≥ 60
ECCM	Automatic Jammer monitoring & frequency selection
Target analysis recognition & classification	Yes
24/7 operation	Yes
Installation	Portable with tripod
Deployment, retrieval time	≤ 10 minutes



Electronic Warfare's Core Technologies Platform and Features

In modern warfare, electronic warfare becomes an importance factor in winning the war. Electronic warfare is a means of multiplying power and is one of the three major parts of high-tech warfare, including both offensive and defensive, and as such, countries have invested much in creating electronic warfare systems.

Viettel has been developing the 3rd and 4th generation Intelligence electronic warfare product lines (Cognitive Electronic Warfare), including lines of electronic reconnaissance, electronic suppression and electronic protection, operating in a wide frequency range, ensuring modern and effective combat capabilities in the electronic field. Viettel's electronic warfare products are designed to ensure the following factors:

OPEN: The products are designed with wide to super wide spectrum; including radio, infrared, optical, ultraviolet spectrums allowing dealing with all types of signals and targets. Software defined radio allows easy, fast addition and update of signal processing algorithms.

COMPACT: The products are designed on a highly modular basis allowing easy optimization of designs for workstations, vehicle-mounted, drones or carry-on. The carry-on or hand-held product lines are optimally designed in terms of size, weight and energy consumption.

CONNECT: Standardizing the design allows products to easily connect to each other to become an effective combat system as well as connect to headquarters at all levels according to the standard model of C5ISR.

INTELLIGENCE: The products are capable of collecting, analyzing, decoding and processing big data (big data analysis); applying machine learning that allows automatic processing of test replacement when necessary.



GENERAL INTRODUCTION

Radio-Electronic Signal Intelligence System has capability of automatic collection, detection, analyzation, classification and localization of suspicious radio signals in a wide frequency range (20 MHz to 3 GHz). The system can be extended to 6 GHz.

KEY FEATURES

- Automatic detection and localization of radio signal sources up to 3 GHz and be extended to 6 GHz.
- Automatic analyzation of signal characteristics (power, bandwidth, frequency...).
- Automatic recognition and demodulation AM, FM, SSB signals.
- Automatically alert when detected suspicious signal sources and store signal.
- Wideband SDR technology, easy to update features via software.
- Capable of connecting to EW C4I, providing information and controlling jamming systems.

SPECIFICATIONS

Frequency range	20 MHz ÷ 3 GHz
Instantaneous bandwidth	40 MHz
Detection sensitivity	-110 dBm
Positioning method	TDOA
Frequency resolution	1 Hz
Signal storage time	Depends on storage device capacity
Power Consumption	< 30 W, air-cooled
Environmental Standard Compatible	MIL-STD 810G

▶ **CELLPHONE JAMMER
- UT38A**



GENERAL INTRODUCTION

A jamming device, suppressing 4 downlink channels of 2G, 3G, 4G mobile phone signal systems (900 MHz, 1800 MHz, 2100 MHz, 2600 MHz), used in command posts, meeting rooms and hall.

SPECIFICATIONS

Operation bandwidth	2G, 3G, 4G
Transmitting power	High power mode: 15 W
	Low power mode: 8 W
Power supply	AC power: 220 V ± 10 % /50 Hz
	DC power: 24÷30 V
Size (length, width, height)	335 mm x 220 mm x 130 mm
Weight	≤ 5 kg
Environmental	
Operating temperature	-40÷60°C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67

KEY FEATURES

- The device's structure is compact and convenient for carrying.
- Jams fully 4 downlink spectrums of cellular networks.
- The device has reliable structure, it works well at severe environment conditions.
- Operates in 2 power modes: high power and low power.

**RADIO FREQUENCY
JAMMER - UT48A**



GENERAL INTRODUCTION

As a device used for mobile units on duty to jam and suppress satellite navigation receivers (GPS, Glonass), devices using 2G, 3G, 4G mobile waves with jamming frequency bands which can be set manually or by computer.

KEY FEATURES

- The device's structure is compact, convenient for both mobile and stationary usage.
- This device operates in UHF range and has 2 independent channels with digital modulated BPSK and linear frequency modulated noise modes.
- This device can be remotely controlled through RS-485 and Ethernet.
- Jamming mode and parameters can be configured using Data transmitting device.

SPECIFICATIONS

Operation bandwidth	UHF
Transmitting power	High power mode: 28 W-38 W
	Low power mode: 18 W-27 W
Power supply	24 VDC/25 A
Size (length, width, height)	380 mm x 310 mm x 157 mm
Weight	≤ 25 kg
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67



GENERAL INTRODUCTION

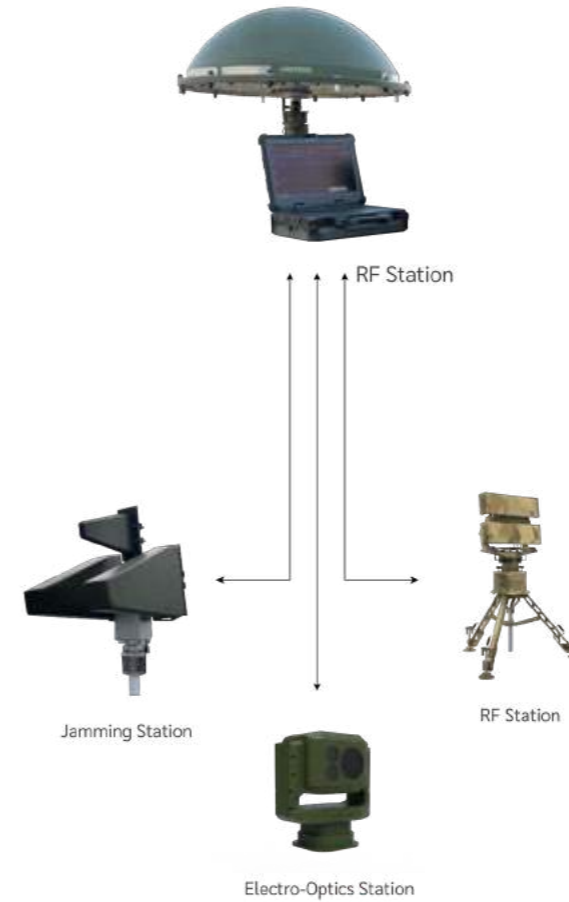
As a device used for mobile units on duty to jam and suppress satellite navigation receivers (GPS, Glonass), devices using 2G, 3G, 4G mobile waves with jamming frequency bands which can be set manually or by computer.

KEY FEATURES

- This machine is capable of scout and jam enemy's VHF communications. This machine is designed with 4U-standard rack structures, convenient for mobile and stationary usage.
- Pre-set jamming mode: Supervise 32 target frequencies, simultaneously jam 4 frequencies based on priorities.
- Automatically jam multiple fixed frequencies, or hopping frequencies.

SPECIFICATIONS

Operation bandwidth	VHF
Transmitting power	267 W ÷ 337 W
Power supply	220 VAC ± 10 %
Input/Output impedance	50 Ω
Size (length, width, height)	760 mm x 584 mm x 762 mm
Weight	≤ 70 kg
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67



GENERAL INTRODUCTION

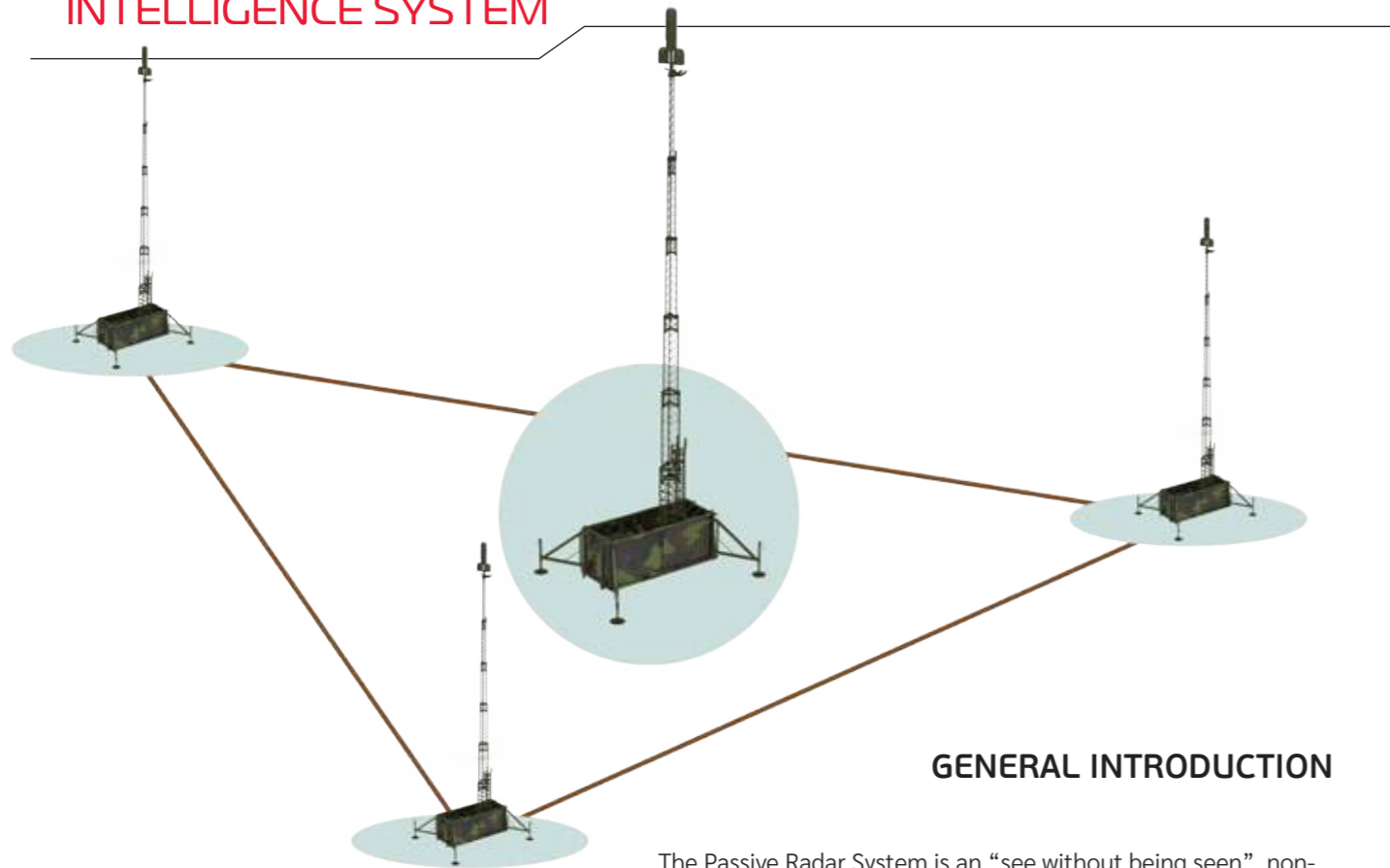
Counter UAV System is a complex for reconnaissance, detection, identification, direction finding, tracking and countermeasure of UAVs/Drones to prevent the penetration, tracking and attack of UAVs in key areas.

The complex includes many components RF sensor, high-resolution radar, optoelectronics and Intelligence high-power jamming Station. The combination of multiple components makes the complex has the probability of detecting a target from a distance of up to 3km and the interception target probability from a distance of 1.5km up to 99.99%.

SPECIFICATIONS

1. Radio Reconnaissance	
Frequency range	20 MHz - 6 GHz
Instantaneous bandwidth	200 MHz
DF accuracy	≤ 3° C
Detection range	10 km (UAV); 4km (Drone)
Azimuth	360° C
Elevation	-10° C ÷ 70° C
2. Radar reconnaissance	
Radar technology	FMCW, X band
Transmitting power	≥ 4 W
Detection range	10 km (UAV); 3.5 km (Drone)
Azimuth error	≤ 10
Sweep rate	60 per minute
3. Optoelectronics reconnaissance	
Thermal image sensor resolution	640 x 512 pixel
Visible light sensor resolution	Full HD 1080p
Continuously vary magnification	30 times
Detection range	5 km (UAV); 1.8 km (Drone)
4. Radio jamming	
Radio jamming range	≥ 3.5 km
Jamming modes	Barrage jamming, Sweep jamming, Frequency hopping follower jamming
GNSS spoofing	≤ 24 supported
Number of simultaneous jamming targets	20 targets
Jamming power	≥ 100 W

▶ ELECTRONIC INTELLIGENCE SYSTEM



GENERAL INTRODUCTION

The Passive Radar System is an “see without being seen”, non-emitting capability ultra-wideband radio receiver system (VHF to Ku band, localization), which has capabilities of real-time detection, identification, localization and tracking air, ground and naval targets, without being detected by the enemies.

KEY FEATURES

- Range of reconnaissance, detection and location up to 400 km, capable of detecting stealth aircrafts.
- Identifying and locating almost all types of signals (radio signals, radar signals, aviation signals) in frequency range from VHF to Ku band, in 3D space (Range, Elevation, and Azimuth).
- Analyzing automatically radar signal characteristics (frequency, time, pulse parameters...).
- Capable of database of targets when new targets appear.
- Wideband SDR technology, AI technology, easy to update features via software.
- Capable of connecting to Electronic Warfare C4I.

SPECIFICATIONS

Frequency range	VHF to Ku band
Instantaneous bandwidth	500 MHz
Range	Up to 400 km
Number of simultaneous tracking targets	up to 500
Target library capacity	≥ 12000
Target location update rate	≤ 1 s
Instantaneous azimuth	120°
Localization method	TDOA

JAMMING VEHICLE ◀



GENERAL INTRODUCTION

The mobility electronic warfare vehicle is equipped for the electronic warfare force to conduct the mission; jamming radio frequency to protect and ensure the security and safety for key locations and military operations.

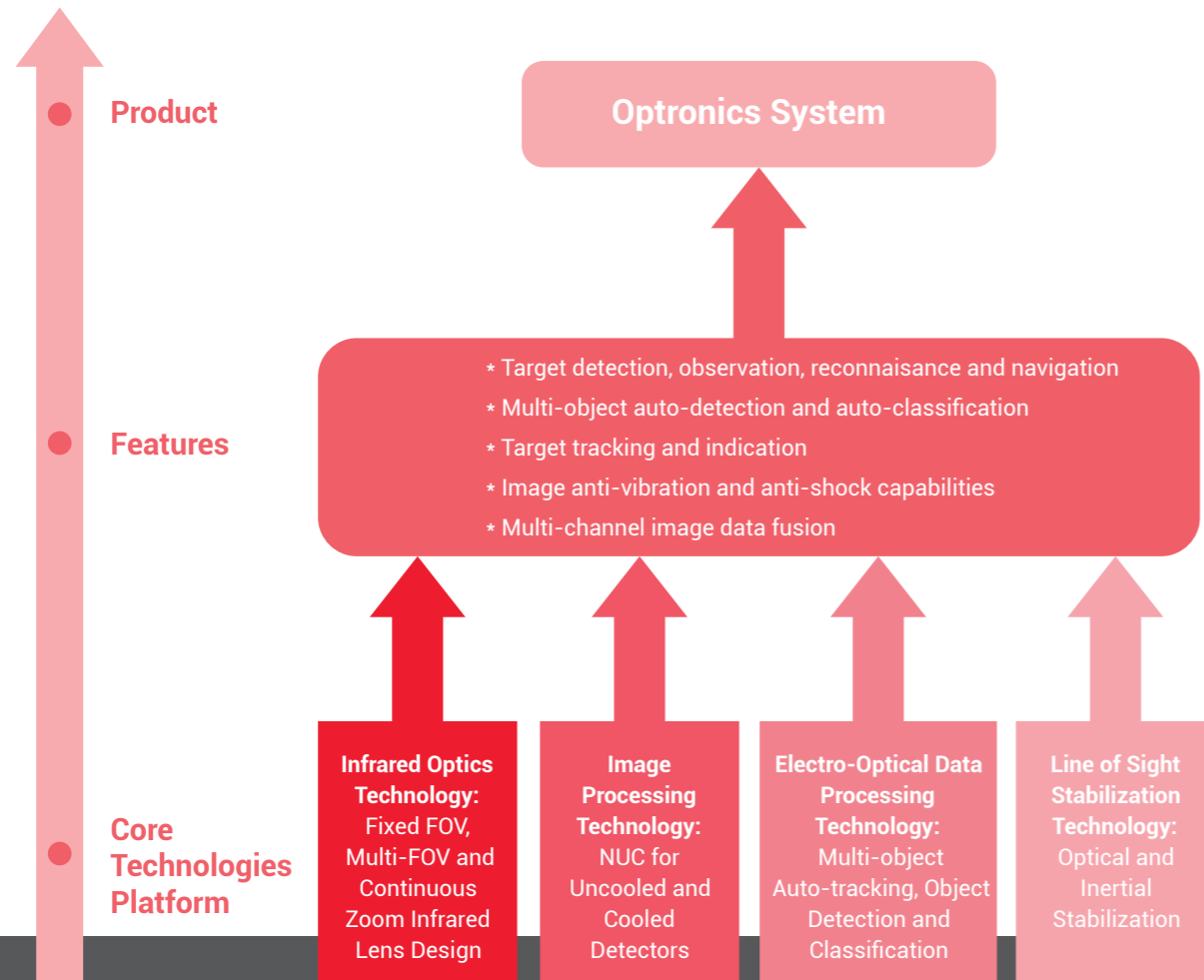
Contribute to the goal of modernizing and improving combat capability of electronic warfare force; contributing to the Electronic warfare ecosystems of Viettel Group.

KEY FEATURES

- To protect the outdoor events, the square.
- Jamming on the cell phone targets, drone, radio devices in UHF/VHF frequency.

SPECIFICATIONS

Operation bandwidth	20 – 6000 MHz
Transmission power	Output power of each mobile network channel: 150 W
	Output power of Drone protection channel: 60-150 W
	Output power of UHF/VHF channel: 300W
Power source	Jamming transmission mode: optional 50% or 100% power
	Grid, generator or battery use in 5 hours
Simultaneous transmission channel	Jamming mobile network: 04 channels
	Drone jamming: 08 channels
	Jamming UHF/VHF: 05 channels
Jamming type	White noise, PSK, QAM
Other functions	Spectrum analyze receiving band: 20-3000 MHz
	Communication commander VHF frequency band 30-87.975 MHz



The Optronics portfolio of Viettel makes use of 3rd and 3rd+ generation of thermal imaging technology in order to accomplish duties such as observation, monitoring, reconnaissance, and target indication. They can be equipped for personal use, vehicles as well as observatories.

- Our thermal imaging Optronic devices can be used in military and civil applications, with the benefits of quick heat-emitting object detection, good observation conditions in low-light environments, independent from illumination conditions, and increased sensitivity in foggy or dusty conditions.

- Designed by a team of experienced engineers and experts with the latest technologies, our products are capable of detecting small targets at high speed and are equivalent to

the most advanced NATO products at the moment. Product customization services following individual user requirements are also available.

- AI, the latest generation of image processing technology, is also being developed in our Optronic products. It is applied in Intelligence monitoring systems for multi-object tracking, auto-classification, and auto-identification in security surveillance, reconnaissance, target indication, and fire control scenarios.



GENERAL INTRODUCTION

An multi-channels, long range optronic system (infrared/visible/ laser range finder) being capable of observing, detecting, tracking and target acquisition for air defense application.

SPECIFICATIONS

Surveillance area	
Azimuth	nx 360°
Elevation	-10° ÷ 90°
Detection range	
Aircraft/UAV	upto 50/60 km
IR Sensor	
Operating Waveband	3-5 μm
Optical Zoom	12x
Detector type	Cooled
Detector Resolution	up to 640 x 512 pixels
Visible Sensor	
Optical Zoom	≥ 12x
Image Resolution	up to 1920 x 1080 pixels
Laser Rangefinder	
Range Performance	≥ 20 km
Operating Conditions	
Voltage	18÷30 VDC/ 220 VAC
Temperature	0 ÷ 50° C
Humidity	95 %

KEY FEATURES

Long-range Infrared pan tilt zoom camera is designed for long-range surveillance in all-weather conditions with advanced automatic image processing features.

- Cooled Infrared and color camera.
- Detection range: 50,000 m.
- High precision target location with ± 5 m accuracy.
- High-speed target tracking.
- Long-term operating in harsh environment.



SPECIFICATIONS	
Specifications	
Detection, recognition, identification	
Vehicle (2.3x2.3 m)	≥2500/800/400 m
Human (1.7x0.5 m)	≥1000/360/180 m
Thermal Camera	
Sensor type	Uncooled, LWIR, 640 x 480 pixels
Frame rate	30 fps
Visible Color Camera	
Sensor type	CMOS, 1280 x 720 pixels
Optical Zoom	12x
Storage	
	64G SD card, Snapshot and Video recording/Replay
Interface	
Electrical Interface	Power, analog Video
Mechanical Interface	1/4" tripod
Power	
Power supply	10,8±24 VDC or Rechargeable Li-on battery 7,4 V
Continuous Working period with battery	≥ 5 hours
Physical Features	
Weight	≤ 2 kg
Dimensions (LxWXH)	≤ 260 mm x 165 mm x 85 mm
Environmental Features	MIL-STD-810G

GENERAL INTRODUCTION

As a versatile handheld thermal imaging reconnaissance device, equipped for the military and the patrol groups and teams, in service of day and night reconnaissance in all weather conditions.

KEY FEATURES

Thermal binocular is designed with uncooled thermal camera, dual day/night channels for military and patrol observation in all weather conditions. Main features of Thermal binoculars are:

- Thermal and visible color cameras.
- Automatic Digital Image Processing.
- Increased situational awareness.
- Optimal designed, energy saving with long operating time.



SPECIFICATIONS	
Specifications	
Reticle	Digital, support for SVD and GALIL sniper rifle
Detection, recognition, identification	
Vehicle (2.3x2.3 m)	≥ 3500/1200/600 m
Human (1.7x0.5 m)	≥1800/600/300 m
Thermal Camera	
Sensor type	Uncooled, LWIR, 640 x 480 pixels
Frame rate	30 fps
Display	
Type	Mono Display
Screen type	Micro Oled
Diopter range	-6 ÷ 2 diop
Interface	
Electrical Interface	Power, analog Video
Power	
Power supply	Rechargeable Li-on battery 3,7 VDC
Continuous Working period	≥ 8 hours
Physical Features	
Weight	≤ 1.3 kg (with battery)
Dimensions (LxWXH)	≤ 320 mm x 100 mm x 85 mm
Environmental Features	MIL-STD-810G

GENERAL INTRODUCTION

As a device to observe, detect and aim at targets all night and day, with using uncooled thermal imaging technology the device is equipped synchronously for SVD and GALIL sniper rifle.

KEY FEATURES

Thermal weapon sight is perfectly adapted to long-term observation, optimized the accuracy and effectiveness of the weapon regardless of the firing conditions and constraints. Based on an uncooled infrared sensor, this sight is compact and light as well as quick and easy to use.

Main features of Thermal weapon sight are:

- Effective and accurate.
- Automatic Digital Image Processing.
- Increased situational awareness.
- Optimal designed, energy saving with long operating time.

▶ LONG-RANGE THERMAL CAMERA (FOR SEA)



SPECIFICATIONS

Surveillance area		
Azimuth	nx3600	
Elevation	-70 ÷ 90° C	
Detection range		
Ship	Up to 50 km	
IR sensor		
Operating Waveband	3-5 μm	
Optical Zoom	≥ 12x	
Detector Type	Cooled	
Resolution	Up to 640 x 512 pixels	
Visible Sensor		
Optical Zoom	≥ 12x	
Resolution	up to 1920x1080 pixels	
Laser range finder	Up to 20 km	
Stablization	4-axis gimbal	
Operating Conditions		
Voltage	24 VDC / 220 VAC	
Temperature	0 ÷ 50°C	
Humidity	≥ 95 %	
Protection	≥ IP66	

GENERAL INTRODUCTION

An multi-channels, long range electro-optic system (infrared/visible/laser range finder) being capable of observing, detecting, tracking and target acquisition for navy applications

KEY FEATURES

- Detection range up to 50 km
- Maximum measurement range: Up to 20 km laser range finder.
- Dual day/night channels for surveillance in all conditions.
- 4 – axis gimbal stabilization.
- Compatibility with C4I/C5I-SR system.

INFRARED SEARCH AND TRACK SYSTEM ◀



SPECIFICATIONS

Coverage		
HFOV	360°	
VFOV	-20 ÷ 45°	
Sensor		
Spectral band	3-5 μm	
Resolution	up to 1280x1024 pixels	
Detection range		
Large ship	up to 19 km	
Human/vehicle	up to 2.5/5 km	
Small UAV	up to 2 km	
Image processing		
High resolution panoramic image	Yes	
Update rate	up to 2 Hz	
Functions		
Auto detection, tracking and classification	Yes	
Simultaneous tracking	≥ 200 targets	
Early warning threat detection	Yes	
FAR	≤ 5/hour	
Environmental conditions	MIL-STD-810G	

GENERAL INTRODUCTION

Day and night 360° permanent surveillance
Ship and critical infrastructure protection
Military & security applications

KEY FEATURES

- High- resolution and fast panoramic imaging
- Detect, track and classify multiple targets simultaneously
- Early warning threat detection with low FAR
- Synchronize with other systems such as radar, EO/IR,...
- Record and playback situations



SPECIFICATIONS

Gunner sight	
LOS Range	-5° ÷ +19.5° (Elevation) / ± 3° (Azimuth)
LOS Stabilization	≤ 0.25 mrad (Elevation) / ≤ 0.15 mrad (Azimuth)
Configuration	Thermal Channel, Visible Channel & Laser Rangefinder
Display	Real-time LCD
Commander Sight	
Configuration	Dual FOV Thermal Channel
Field of View	4.6° (NFOV) / 14.3° (WFOV)
Zoom Capabilities	3x Optical, 2x Digital
Display	Real-time OLED
Driver Sight	
Configuration	Thermal Channel & Visible Channel
Field of View	43° (Thermal) / 53° (Visible)
Display	Real-time LCD
General Operating Conditions	
Voltage	18 ÷ 33 VDC
Temperature	-10° C ÷ 55° C
Humidity	95 %
Shock Resistance	40 G (11 ms)
Rain/Dust	IP67

GENERAL INTRODUCTION

An overall upgrade package for armored vehicles, including a fire control system for the gunner and the commander, a multi-channel vision enhancer system for the driver. This package provides an automatically accurate aiming and shooting capabilities and comfortable vehicle maneuver in different operating environments.

KEY FEATURES

- NATO target detection / recognition / identification range at 6 km/2 km/1 km respectively.
- Maximum laser rangefinder (LRF) measurement range at 9 km for NATO target.
- Multi-channels observation capability with visible and thermal imaging.
- Dual-axis LOS stabilization accuracy: Elevation ≤ 0.25 mrad, Azimuth ≤ 0.15 mrad.
- Sight-to-Gun synchronization accuracy ≤ 0.2 mrad.
- Low system latency and harsh environment operation capabilities.



SPECIFICATIONS

General	
Maximum Measuring Distance (Beam filling, Albedo 60%, 20km Visibility)	> 9000 m
Wavelength (nominal at 20° C)	1.535 μm
Laser Classification (IEC 60825-1:2014)	1M
Modes of Operation	up to 5 Hz
Accuracy typical [1σ]	± 2 m
Environmental	
Operating Temperature	-20° C ÷ 65° C
Mechanical vibration	3.7 g, 5-2000 Hz
Mechanical Shock	40 g, 11 ms
Electrical and Communication	
Power Consumption	≤ 2 W
Control Interface	RS422

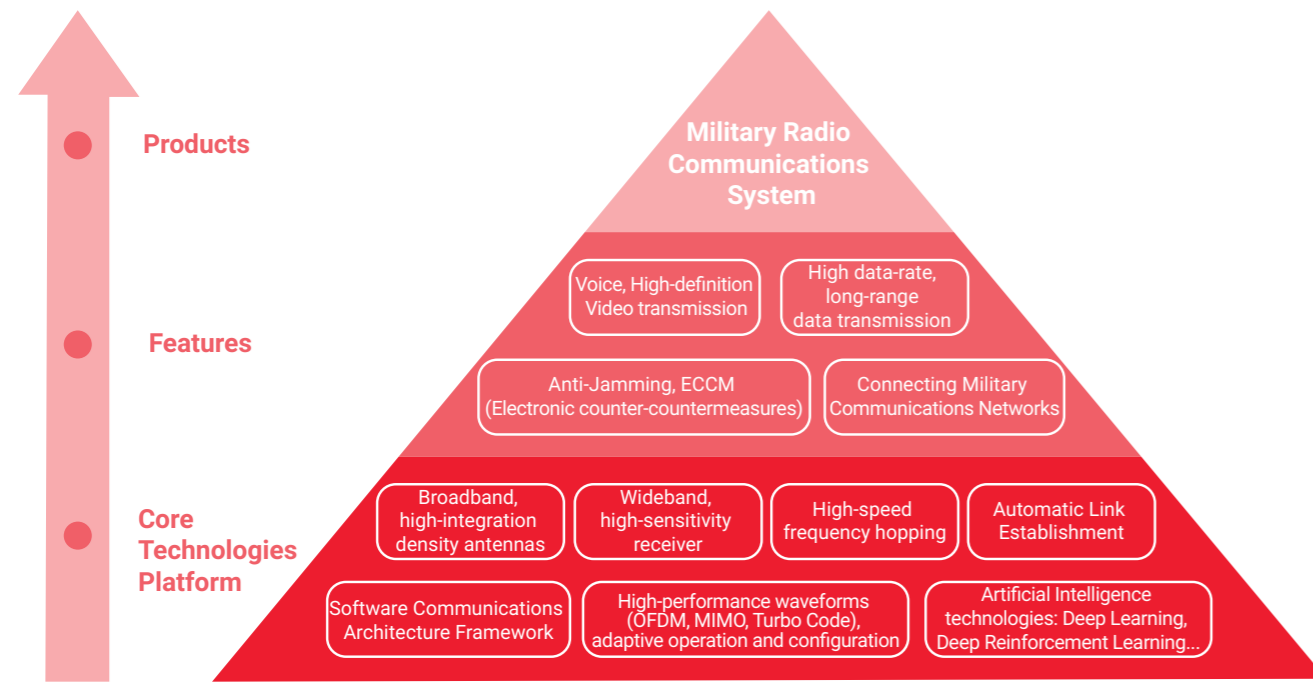
GENERAL INTRODUCTION

As a long range laser rangefinder (LRF) is capable of measuring distance up to 9 km, ideal for ground medium range applications

KEY FEATURES

- Eye-safe, open frame available
- Designed to perform under adverse conditions.
- Continuous lasing at repetition rates of 1-5 Hz
- Integrated, borsighted IR and daylight camera.
- Rugged MIL-STD-810G/IEC 60825 – 1:2014 qualified.

▶ MILITARY COMMUNICATIONS



Viettel has been applying the latest technologies in the world today to design, develop and manufacture radio communication equipment, the 4th and 5th generations contribute to solving almost all communication problems in military and civil fields to ensure accurate, fast and reliable communication.

- Viettel's communication products are fully compatible with US military communication standards and NATO standards. The products are of high quality, fully mastered in core technologies, features and specifications, capable of being customized to meet customer requirements and at reasonable prices.

- Viettel masters core technologies such as: SDR technology; artificial intelligence (deep learning, deep reinforcement learning...); high-speed broadband adaptive communication technologies (hundreds of Mbps to Gbps); long-range communication technologies (up to thousands of kilometers

away); cognitive radio technology (a new generation adaptive communication technology that allows access to increasingly narrow bandwidth while the number of devices accessing bandwidth is increasing); high-frequency hardware technologies (to GHz) with broadband processing hardware system (tens of MHz).

- Viettel has also developed the latest technologies to make the product resistant to electronic warfare such as: high-speed adaptive frequency hopping (thousands of frequency hops/second); communication waveforms developed by Viettel with its own security features; advanced signal processing technologies (MIMO, OFDM, Turbo code, LDPC code...); multi-band adaptive modulation technologies; automatic link establishment technology ALE-3G (advance development to ALE-4G).

PERSONAL ROLE ◀ RADIO - UX18A



GENERAL INTRODUCTION

UX18A is a personal communication radio operated in the UHF band, ensures the tactical level communication; Ensured radio communications in squads and special forces in a narrow range.

KEY FEATURES

- MESH ad-hoc network: self-creating, self-organizing, self-administering, infrastructure-less.
- Full-duplex operation: speaking and listening simultaneously.
- Voice conference: up to 6 talkers.
- Auto-relay: rebroadcast automatically of data/voice (up to 4 hops).
- Gateway: allow radios connection to Combat Net Radio network.
- Act as a gateway allowing radios to connect to Combat Net Radio network.
- Video transmission: used with special camera to transmit real time video (advanced option).
- Adaptive data transmission: flexible data rate depending on environmental conditions.
- GNSS support: localization capability of soldiers.
- Wireless Push-to-Talk: wirelessly control transmitting/receiving of radios.
- Encryption: High-grade customizable & programmable encryption.

SPECIFICATIONS

Frequency range	UHF
Preset channel	10
Output power	1 W, 2 W
Data (maximum user)	64 kbps
Digital voice	G729
Built-in position navigation system	
Power supply	3.6 V, Li-Ion
Dimension (W x D x H)	105 x 73 x 30 mm
Weight	Less than 350 g
Environmental	
Operating temperature	-10° C to 70° C
Vibration	MIL-STD-810
Shock	MIL-STD-810
Dust & Water Resistance	IP67

▶ VHF TACTICAL HANDHELD RADIO - VX29A



GENERAL INTRODUCTION

VX29A is a VHF frequency-hopping microwave radio transceiver using SDR technology, serving the tactical level; Ability of voice communication, data transmission, secure encryption, anti-electronic warfare; Designed to be compact, oriented to equip ground forces.

SPECIFICATIONS	
Frequency range	30 to 88 MHz
Number of preset channels	10
Output power	5 W
Sensitivity in SSB	Less than 0.35 μV SINAD 10 dB
Frequency Hopping (FH)	Yes
Data (maximum user data rate)	9600 bps
Digital voice	MELP, CVSD
Encryption	AES128, AES256
Built-in position navigation system	
Power supply	14.4 V, Li-ion
Dimension (W x D x H)	95 x 41 x 240 mm (battery included)
Weight	Less than 1 kg (battery included)
Environmental	
Operating temperature	-10° C to 70° C
Vibration	MIL-STD-810
Shock	MIL-STD-810
Dust & Water Resistance	IP67

KEY FEATURES

- Software Defined Radio: Flexible update capability (function, waveform).
- ECCM: Frequency-hopping assures reliable and successful operations in densely-jammed environments.
- High-speed data transmission: Adaptive, ARQ, broadcast.
- GNSS support: localization capability of soldiers.
- Support Voice operated exchange (VOX).
- Encryption: High-grade customizable & programmable encryption.

VHF TRANSCEIVER - ◀ VX28A



KEY FEATURES

- VHF hopping-transceiver, this device is mainly used for tactical level to transmit and receive voice signal and message via very high frequency.
- It can be used by infantry, artillery, tanks, aerial observer and marine.
- This device uses simplex method and is very simple, flexible to adjust working frequency in narrow frequency range.
- It can be controlled by remote controller.
- The transceiver is structured with a casing from cast-aluminum, ensuring durability in harsh conditions.

SPECIFICATIONS	
Operation bandwidth	VHF
Modes of operation	Fixed frequency: Clear voice calls (FIX/C); Secret Encrypted voice calls (FIX/S); ECC/C; ECC/S; Sending messages
Power supply	14.4 VDC ± 10 %
Dimension (length, width, height)	116 mm x 70 mm x 198 mm (without battery)
Weight	≤ 2 kg (without battery)
Transmitting power	High power mode: 5 W Lan power mode: ≥ 1.5 W
Frequency-hopping	Yes
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67

GENERAL INTRODUCTION

HX69A is a shortwave frequency hopping (HF) radio transceiver using SDR technology, serving for campaign and tactical level communications. The ability to communicate voice, data transmission, encryption security, anti-electronic warfare, orientation as a fixed transceiver station or installed on boats, mobile vehicles, armored tanks.



SPECIFICATIONS	
Technology	SDR
Communication range	2000 km
Frequency range	1.5 to 30 MHz
Number of preset channels	100 normal/100 ALE
Output power	Up to 125 W
Sensitivity in SSB	Less than 0.5 μV SINAD 12 dB
Automatic Link Establishment (ALE)	3G (MIL-STD-188-141B)
Frequency Hopping (FH)	Multispeed support
Data (maximum user data rate)	2,400 bps
Voice Encoder	MELP
Encryption	AES256
Power supply	12/24 VDC/AC220V
Dimension (W x D x H)	400 x 400 x 300 mm
Weight	Less than 15 kg
Environmental	
Operating temperature	-10° C to 70° C
Shock	MIL-STD-810
Vibration	MIL-STD-810
Dust & Water Resistance	IP67

KEY FEATURES

- Software Defined Radio: Flexible update capability (function, waveform).
- Support voice, data, message communication.
- GNSS support: localization capability of soldiers.
- ECCM: Frequency-hopping assures reliable and successful operations in densely-jammed environments.
- Built-in high quality voice encoder: based on the Mixed Excitation Linear Prediction (MELP).
- Dual frequency support.
- Detachable UI: Flexible and easily deployed in limited space.
- Remote control: Full control, up to 5 km.
- High-grade customizable & programmable encryption.



SPECIFICATIONS

Frequency range	1.5 to 88 MHz
Number of preset channels	100 channels HF and 100 channels VHF
Output power	5/10/20 W in HF 2/5/10 W in VHF
Sensitivity	Less than 0.35 μV SINAD 10 dB (HF SSB, VHF FM)
Automatic Link Establishment (ALE)	3G MIL-STD-188-141B
Frequency Hopping (FH)	Yes
Data (maximum user data rate)	HF: up to 4800 bps, VHF: up to 19200 bps
Digital voice	MELP, CVSD
Built-in position navigation system	GPS, Baidu, Glonass
Power supply	14.4 V
Dimension (W x D x H)	210 x 236 x 75,5 mm
Weight	Less than 4 kg (antenna excluded)
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67

KEY FEATURES

A multi-band, multi-mode transceiver, works at HF & VHF band, used at tactical and campaign level, communication range up to 1000 km.

- Software Defined Radio (SDR) technology: Direct RF conversion, Flexible update capability (function, waveform).
- Multiband (HF & VHF), Multimode, Multichannel.
- Automatic Link Establishment (ALE) in HF band: MIL-STD-188-141B (3G).
- ECCM: Support Frequency Hopping in both HF and VHF band
- IP over HF (STANAG 5066).
- High-speed data transmission: Adaptive Data Transmission, ARQ, broadcast.
- GNSS support: localization capability of soldiers.
- Remote control: full control, up to 5 km.
- Encryption: High-grade customizable & programmable encryption.

▶ VHF TACTICAL RADIO - VX39A



GENERAL INTRODUCTION

VX39A is a frequency-hopping microwave radio transceiver using SDR technology, serving the tactical level; being capable of voice communication, data transmission, security encryption, anti-electronic warfare, oriented to equip the army up to the level of Infantry and Tank and Armored Division and Brigade.

SPECIFICATIONS

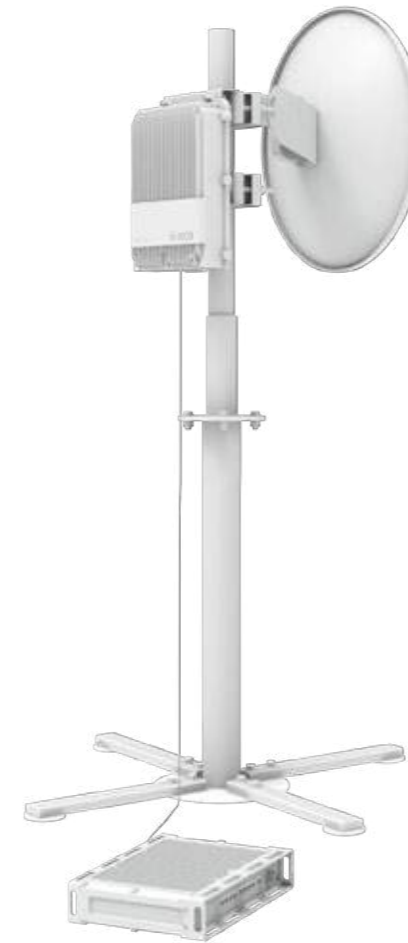
Communication range	Up to 20 km
Frequency range	30 to 88 MHz
Number of preset channels	10
Output power	2/10/50 W (Power amplifier included)
Sensitivity in SSB	Less than 0.35 μ V SINAD 10 dB
Frequency Hopping (FH)	Yes
Data (maximum user data rate)	19200 bps
Digital voice	MELP, CVSD
Secured encryption	AES128, AES256
Built-in position navigation system	GPS, Baidu, Glonass
Power supply	14.4 V, Li-Ion (10 W), 26 VDC (50 W)
Dimension (W x D x H)	210 x 235 x 75,5 mm (10 W, battery excluded) 258 x 310 x 224 mm (50 W)
Weight	Less than 3.6 kg (10 W, battery excluded) Less than 16.6 kg (50 W)
Environmental	
Operating temperature	-10° C to 70° C
Vibration	MIL-STD-810
Shock	MIL-STD-810
Dust & Water Resistance	IP67

KEY FEATURES

A multi-purpose VHF transceiver, used at tactical level communications by brigades, infantry divisions or in tanks

- Software Defined Radio (SDR) technology: Flexible update capability (function, waveform).
- Support services: voice, data, message communication.
- ECCM: Frequency-hopping assures reliable and successful operations in densely-jammed environments.
- High-speed data transmission: Adaptive, ARQ, broadcast.
- GNSS support: localization capability of soldiers.
- Relay capability: extend the communication range of radios.
- Remote control: full control, up to 5 km.
- Encryption: High-grade customizable & programmable encryption.

HIGH CAPACITY DUPLEX TRANSCEIVER RADIO DEVICE -VUX39A ◀



KEY FEATURES

High capacity duplex transceiver radio device with multi-channels, high-speed broadband, used for dedicated stations, repeater stations or mounting on vehicles.

- Software Defined Radio: Flexible update capability (function, waveform).
- Can be used as a repeater station or mounted on the vehicle.
- Duplex or half-duplex mode.
- ECCM: Frequency-hopping assures reliable and successful operations in densely-jammed environments.
- Adaptive Power Control.
- Adaptive Frequency Control.
- Adaptive Data Transmission.
- GNSS support.
- High-grade customizable & programmable encryption.

SPECIFICATIONS

Operating frequency range	C or X band
Contact distance	25 km (LOS)
Frequency hopping speed	2000 hop/s
Data transfer rate	100 Mbps
IP Interface	4
E1 Interface	2
E2 Interface	2
RRU size (DxRx C)	250x280x70 mm
Weight	\leq 10 kg (antenna not included)
Size (DxRx C)	350 x 254 x 73 mm
Weight	\leq 10 kg
Temperature	24/48 VDC; AC 220 V
Humidity, airtight, vibration	Military standard



GENERAL INTRODUCTION

The field telephone can be carried in bags, or left on desks at information stations and desks; The phone has a compact, sturdy structure that can work in stationary conditions or mounted on mobile vehicles.

The field telephone can work with other communication machines such as: field telephone TA57-B, electromechanical switchboard, total multi-function military digital radio, digital switchboard. The field telephone is usually equipped at the strategic, operational, tactical or military information force levels.

SPECIFICATIONS	
DC resistor (When working in connection mode with digital switchboard)	≥ 1 MΩ
Consumption line (When working in connection mode with digital switchboard)	≤ 50 mA
Sensitivity of the bell receiver (When working in connection mode with digital switchboard)	(30 ±75) VAC
Size	≤ (300x200x150) mm
Weight	≤ 3 kg



KEY FEATURES

The field switchboard 20 subscribers is an improved 20-digit switchboard, which can be carried by hand, or left on the table at information stations. The switchboard has a compact, sturdy structure that can work in static conditions. or mounted on mobile vehicles. The switchboard shell is made of CT3 steel or aluminum or equivalent with surface treatment or anti-rust paint, compact in size, suitable for mobile equipment on all terrains. The switchboard performs call forwarding using a system of buttons on the face of the device.

It is a type of machine that can be carried around or placed on a table with a compact and sturdy structure, which can work in stationary or mobile conditions. Compact size, suitable for field mobile equipment of regiments and independent battalion levels in training, maneuvers, and combat on all battlefields.

SPECIFICATIONS	
Capacity	20 subscribers
Attenuation Transmission	≤ 0,86 dB
Attenuation Crosstalk	≥ 73 dB
Calling signal level	12±15 VAC
Dimension (WxDxH)	≤ (600x350x350) mm
Weight	≤ 19 kg



GENERAL INTRODU

The Field switchboard 40 subscribers is an improved 40-digit switchboard, which can be carried or placed on the table at information stations. The switchboard has a compact, sturdy structure that can work in static conditions. or mounted on mobile vehicles. The switchboard shell is made of CT3 steel or aluminum or equivalent with surface treatment or anti-rust paint, compact in size, suitable for mobile equipment on all terrains. The switchboard performs call forwarding using a system of buttons on the face of the device.

It is a type of machine that can be carried around or placed on a table with a compact and sturdy structure, which can work in stationary or mobile conditions. Compact size, suitable for field mobile equipment of regiments and independent battalion levels in training, maneuvers, and combat on all battlefields.

SPECIFICATIONS

Capacity (Subscription)	40 subscribers
Attenuation Transmission	≤ 0,86 dB
Attenuation Crosstalk	≥ 73 dB
Calling signal level	12÷15 VAC
Dimension	≤ (600x350x350) mm
Weight	≤ 19 kg



KEY FEATURES

Field optical cable has high mechanical strength, good tensile, compression, impact and abrasion resistance. The cable has a flexible structure, the cable container is compact, mobile, quick to deploy and recover, suitable for communication stations, mobile communication vehicles, radio stations, and stations. The batch of cables meets the requirements of all-terrain combat in combat conditions, ready-to-battle maneuvers.

Application: Field optical cable is used for mobile connection in data transmission, data, communication between military information equipment on the battlefield.

SPECIFICATIONS

Cable length	500 m
Weight	34 ± 3 kg
Number of optical fibers	4 fibers
Fiber type	single fiber mode G.652 or G.657
Diameter of tightly wrapped fiber	0.90 mm ± 0.05 mm
Cable diameter	6.0 ± 0.2 mm
Cable sheath material	Polyurethane (PU)
Polyurethane (PU) transmission loss	≤ 0,3 dB/km at 1550 nm ≤ 0,4 dB/km at 1310 nm
Tensile capacity	≥ 800 N
Compression resistance	≥ 400 N/10cm
Minimum bend radius	≤ 10 x D _{cable}
Working temperature	-10°C to + 75°C



GENERAL INTRODUCTION

- This device is single sideband HF transceiver that is used in military communication.
- It uses 14.4 VDC source, battery, or hand generator.
- The transceiver uses three types of antenna: whip antenna, slant antenna and two-pole antenna.
- The transceiver structure is compact and convenient for carrying.
- By using a temperature-compensated quartz oscillators inside, the transceiver's frequency accuracy is high and less affected by environmental conditions.
- It uses direct digital synthesizer (DDS) which is able to set frequency quickly and precisely.
- It uses microprocessor to remember frequency, display, memorize channel, scan and auto turning antenna tuner in very short time with high accuracy.
- The transceiver's case is made of aluminum alloy to prevent moisture, water and shock.

SPECIFICATIONS	
Operation bandwidth	HF
Modes of operation	USB, LSB, CW, NCW
Power supply	14.4 VDC ± 10 %
Dimension (length, width, height)	265 mm x 226 mm x 80 mm (without battery)
Weight	≤ 4.6 kg (without battery)
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67



GENERAL INTRODUCTION

The HX28A is a portable HF transceiver used in military communication.

The transceiver is able to work with many types of antenna: whip antenna, slant antenna and dipole antenna.

HF transceiver is small-sized and light, which is convenient for portability.

KEY FEATURES

- HF transceiver uses temperature-compensated quartz oscillator as standard frequency source.
- The transceiver's case is made of aluminum alloy to ensure the tightness and prevent humidity, water and impact.
- In high power mode, It can communicate with distance up to 200 km.

SPECIFICATIONS	
Operation bandwidth	2.0000 MHz ÷ 11.9999 MHz
Modes of operation	USB; LSB; CW; NCW
Power supply	14.4 VDC ± 10 %
Power transmission	High power mode: 5 W±1 dB; Low power mode: ≥ 1.6 W
Receiver sensitivity	SSB ≤ 1 μV; CW ≤ 1 μV; NCW ≤ 0.5 μV
Size (LxWxH)	116 mm x 70 mm x 198 mm (without battery)
Weight	≤ 2 kg (without battery); ≤ 2.5 kg (with battery)
Operating conditions	Temperature: -10° C ÷ +50° C Relative humidity : 98 %

▶ HF TRANSMITTER
- HT67A



GENERAL INTRODUCTION

- The HT67A is HF transmitter used at military stations.
- It has 125 W high power mode and 50 W low power mode.
- In high power mode, this device can communicate with distance up to 2000 km.
- It uses a temperature compensated quartz oscillator, bringing high accuracy in frequency and less affected by environmental conditions.
- Uses direct digital synthesizer (DDS) which is able to set the frequency quickly and precisely.
- It has new functions such as: Memorize working frequency, display and scan memorized channels.
- It combines with auto turning unit (ATU) to perform impedance matching in short time and of high accuracy.
- It has the ability to communicate with a computer in order to automatically receive instructions for transmitting messages
- interpreted from characters into the form of Morse codes or several messages available in the computer which can be transmitted by the device when activated.

SPECIFICATIONS

Operation bandwidth	HF
Modes of operation	USB, LSB, CW and CW-AT
Power transmission	High power mode: 125 W
	Low power mode: 50 W
Size (length, width, height)	445 mm x 300 mm x 100 mm
Weight	≤ 10 kg
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67

HF TRANSMITTER - ◀
HT67B



GENERAL INTRODUCTION

- HF Transmitter is able to continuously transmit 24/24 hours and used in military stations.
- The transmitter has 150 W high power mode and 50 W low power mode.
- The operation bandwidth of this device is HF range and frequency space is 100 Hz.
- It is communicate with distance up to 2000 km.
- It uses a temperature compensated quartz oscillator, bringing high accuracy in frequency and less affected by environmental conditions.
- Uses direct digital synthesizer (DDS) which is able to set frequency quickly and precisely.
- It has new functions such as: Memorize working frequency, display and scan memorized channels.
- It combines with auto turning unit (ATU) to perform impedance matching in short time and of high accuracy.

SPECIFICATIONS

Operation bandwidth	HF
Modes of operation	USB, LSB, CW and CW-B1AT
Power transmission	High power mode: 150 W
	Low power mode: 50 W
Power supply	14.4 VDC ± 10 %
Ability of continuous operation	24/24 hours
Size (length, width, height)	385 mm x 345 mm x 380 mm
Weight	≤30 kg
Environmental	
Operating temperature	-40÷60° C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67

▶ HF RECEIVER - HR07A



FEATURE

- The HR07A is HF receiver specially used for deploying receiving stations.
- It uses 14.4 VDC power supply, cell or a specialized power source. It is designed to be light of compact size, which is convenient for movability.
- The HF receiver uses a temperature-compensated quartz oscillator, bringing stability and high accuracy in frequency and less affected by changeable environmental conditions.
- It uses direct digital synthesizer (DDS) which is able to set frequency quickly and precisely.
- It has many new properties such as scanning by memorized channels or by frequency.
- It uses pole antenna.
- The receiver's case is made of aluminum alloy, bringing high durability and resistance to strong impact.

SPECIFICATIONS

Opeation bandwidth	HF
Modes of operations	USB, LSB, CW and NCW
Power supply	14.4 VDC ± 10%
Ability of continuous operation	24/24 hours
Size (length, width, height)	276 mm x 268 mm x 88 mm (without battery)
Weight	≤ 3.6 kg
Environmental	
Operating temperature	-40÷60°C (Adjustable)
Vibration	MIL-STD-810
Shock	MIL-STD-810
EMI/EMC	MIL-STD-461E
Dust & Water Resistance	IP67

SHORT-WAVE TRANSMISSION SYSTEM WBHF ◀



GENERAL INTRODUCTION

- Short-wave transmission system - WBHF is an advanced, COMSEC/ECCM HF radio system for reliable voice and data communication missions. Based on SDR technology and advanced digital signal processing, WBHF can be used for very-long range communication which is up to 2000 km (beyond the Line of Sight).
- WBHF supports high-performance Automatic Link Establishment and data link protocols support fast, reliable, and error-free data transfer-even under the most challenging channel conditions.
- WBHF has a modular design, containing 4 parts (Central Unit, RF Amplifier, ATU and Power Supply Unit). All are mounted in a 19-inch rack which is easy to install in vehicles, cabins and easy to transport.

SPECIFICATIONS

Frequency range	1.5 to 30 MHz
Channel Spacing	10 Hz
Number of pre-set channels	100
Bandwidth	NB (Narrow Band): 3 kHz WB (Wide Band): 6 kHz, 12 kHz, 24 kHz
Data rates	up to 120 kbps
Mode of Operation	Clear and Secure
Modulation	CW, SSB, AM, M-PSK
Auto Link Establishment	ALE 4G (MIL-STD-188-141D)
Frequency Hopping (FH)	Multispeed support
Voice Encoder	MELP600, MELP1200
Encryption	AES 256, support user crypto module
Global positioning	GPS, GLONASS, GALILEO
Power Output	250/500/1000 W
Power Supply Input	48 VDC or 230 V ±10 %, 50 Hz, single phase

GENERAL INTRODUCTION

The next generation military communications radio (MCR) is a new generation of cognitive radio, used for multi-target communication with the operating frequency band from 30 MHz - 2600 MHz.

Cognitive Radio (CR) along with the SCA 4.1 software platform, allows the machine to automatically adjust working modes according to environmental conditions, and easily update advanced information machine features via software.

Manpack Cognitive Radio is a portable configuration, mid-level tactical communications, capable of full-duplex communication, group communication, multi-member network organization.



FEATURE

- Supports transmission modes
- Adaptive frequency hopping (AFH) up to 1000 hops/s.
- Support real-time VIDEO transmission in a variety of transmission conditions.
- Support inter-level broadband MANET network up to 256 members, speed up to 2Mbps.
- The ability to operate two bands simultaneously in parallel.
- Supports connection of peripheral devices (Soldier Health Sensor) via Bluetooth BLE interface.

SPECIFICATIONS

Frequency range	30 to 2600 MHz
Data rate	up to 100 Mbps
Mode of Operation	Clear and Secure
Global positioning	GPS, GLONASS, GALILEO
Number of pre-set channels	100
Encryption	AES 256, support user crypto module
Architecture and Protocol Architecture (SCA 4.1)	Software Communication Architecture (SCA 4.1)
Power Output	up to 10 W
Dimensions (D x R x C)	236 x 210 x 75.5 mm
Weight	5.2 kg (without antenna)
Temperature, Humidity, Airtight, Vibration, Impact	Military Standard

FEATURE

- Feature of 8-channel simultaneous receiving.
- Feature of simultaneously and synchronously back-up 8-channel demodulators.
- Feature of spectrum analysis, spectrum display (Min Hold, Max Hold, Average, Clear Write).
- Feature of spectrum analysis, waterfall plot with observation time up to 45 min.
- Feature of detailed spectrum analysis, spectrum display with resolution bandwidth up to 24 Hz.
- Feature of spectrum occupation.
- Feature of speaker demodulator and signal transmitter: AM, DSB-SC, FM, WFM, USB, LSB, CW, HF-FIX, VF1/S, FIX/S.
- Feature of automatic classification according to the signal's type of demodulators: AM, FM, SSB, 2-FSK
- Feature of peak search up to 8 markers and autoparallel with modulating channel.
- Manual or automatic feature of spectrum monitoring/ receiving demodulation.
- Feature of I/Q signal received storage.



SPECIFICATIONS

Operating frequency	1.5 MHz - 3 GHz
Instantaneous bandwidth	40 MHz
Receiver sensitivity	SSB/CW: ≤ -115 dBm (SINAD 10dB) AM: ≤ -90 dBm (SINAD 10dB) FM: ≤ -100 dBm (SINAD 10dB)
Number of receiving demodulators and independent storage	8 parallel channels
Types of demodulators	AM, DSB-SC, FM, WFM, USB, LSB, CW, HF-FIX, VF1/S, FIX/S.
This device is capable of remote spectrum monitor via Ethernet through TCP/IP protocol	
Support TDOA location positioning feature when connected to the same IP network with at least 3 devices	
Vibration and Shock	MIL-STD-810G
Operating Temperature	-10°C - 70°C



GENERAL INTRODUCTION

The IP phone with is used for video and video communication over an 8-wire interface according to the RJ45 standard.

The body of the phone is made of ABS plastic or other plastics with equivalent features, compact and sturdy structure, can be fixed or mounted on mobile vehicles. The device uses SIP signaling, compatible with all types of IP PBXs in the Military information network.

SPECIFICATIONS	
Voice	High quality sound, 2-way speakerphone conversation
Image (video)	HD video call 720p or equivalent
Camera	2.0 Mega pixel or better, plug & play
Display	LCD/TFT minimum 7 inch with 1024x600 resolution or equivalent
Size	≤ (350x300x250) mm
Weight (without battery)	≤ 3 kg

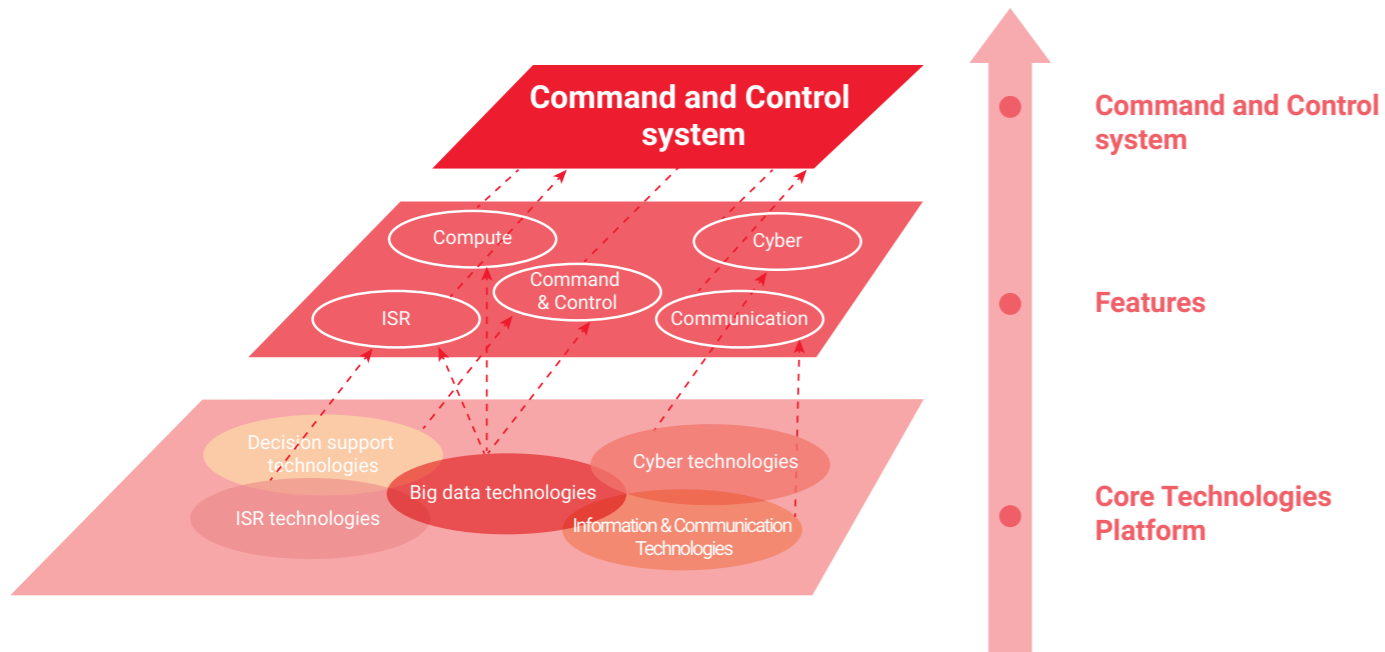


GENERAL INTRODUCTION

An internal communication system used on moving vehicles such as tanks, armored vehicles, warships, internal artillery.

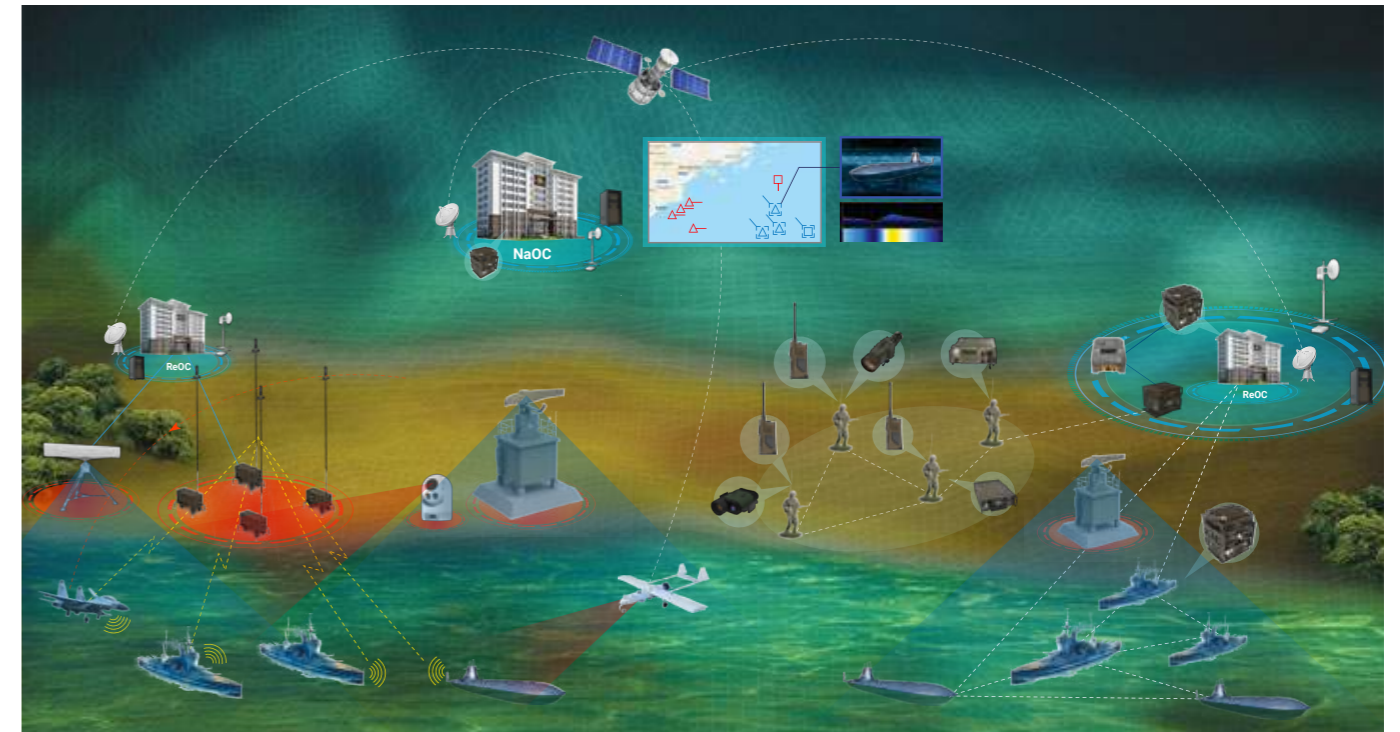
FEATURE

- Inter-vehicular conference between crew members
- Voice communication with other vehicular via radio
- Dynamic noise reduction
- Voice message support
- Power line communication: transmit data and power on the same line
- GNSS support
- Connecting to VoIP network supporting SIP protocol



Viettel has researched and developed command automation systems to the 5th generation to perform command, control and computing tasks in the C5ISR combat model. These systems are responsible for displaying the entire picture of the combat situation, processing, analyzing and supporting the commander to make quick and accurate decisions. Viettel High Technology Industries Corporation's Command and Control system is built on mastering the most advanced technologies available today, at the same time, VHT has been building its own hardware model for the system by separating the components in the C5ISR system into discrete services and functions such as: Connecting Communication, Command & Control, Computing, ISR, Cyber along with the respective technology platforms. VHT Corporation also orients the development of Command and Control systems focusing on the following factors:

Open architecture, broad system scalability, capable of integrating different combat units, transmitting information and delivering orders to each soldier, attaching equipment to the system to ensure real-time combat coordination. Building a communication platform for the system with the following features: Wireless transmission, Transmission in low bandwidth conditions, transmission with high reliability. With the foundation and achieved results, VHT is forming a "multi-domain" command and control product: On the ground, at sea, in the air, in electromagnetic space, in cyberspace, connecting the entire command automation system of the arms of the whole army into an overall system.



KEY FEATURES

Collect, process, and merge information from sources in the air, sea, and underwater in real time, build a comprehensive picture of the sea:

- Provide Situational Awareness.
- Friend or Foe units Tracking.
- Manage Battlefield Information.
- Tabular Display and Graphical Display on Digital Map.
- Support Mission Planning.
- Monitor Tasks operation.
- Monitor Operational and Logistics Status.
- Manage Reports and Messages.
- Decision Support.
- Sensor Management.
- Interoperability with Other Armed Forces Systems

GENERAL INTRODUCTION

Navy Command and Control System is an automated system that provides situational awareness to naval forces to enhance their decision-making and provide a tactical advantage in complex environments.

SPECIFICATIONS	
Number of concurrent targets	Up to 100.000
Track update rate	≤ 5 seconds
Number of concurrent calculation targets	3000
Number of proposed actions per target	Up to 5
Computer Operating systems	Linux based
Deployment	Fixed & Mobility Center

▶ ELECTRONIC WARFARE COMMAND AND CONTROL SYSTEM



KEY FEATURES

- Connect and collect information from reconnaissance electronic warfare units.
- Process information and build a recognized electronic picture.
- Analyse, assess and report reconnaissance electronic in real time.
- Evaluate the threat and warning unusual activities.
- Transmit command from commander to Subordinate units.
- Support data-recording and re-display data in the Electronic Situation Display.
- Support to build operational and training plans.

GENERAL INTRODUCTION

Electronic warfare command and control system is an automated system of command and control of Electronic Warfare Operations. The system provides the commander with a picture of situation in air, navy and land, supporting the commander to make timely and accurate operational decisions.

SPECIFICATIONS

Number of concurrent targets	Up to 300
Target's information update rate	5 s
Frequency Band	HF, VHF, UHF
Digital Map	Yes
Time of data-recording storage	Up to 90 days
Operating System	Linux based

AIR DEFENSE COMMAND AND CONTROL SYSTEM ◀



GENERAL INTRODUCTION

Air Defense Command and Control System is an automated system of command and control of air defense and air force operations. The system provides the commander with a picture of situation in the air, supporting the commander to make timely and accurate operational decisions.

KEY FEATURES

Main features of the National Air Defense Command and Control System are:

Situational Awareness

- Collect, process and gather information from military radars, civil radars and other intelligence sources.
- Provide Recognized Air Picture (RAP) and transmit to other related units.

Support Decision-making Process

Air Defense Tactical support

- Collect, process information, warn and assess the level of danger of flying targets.
- Calculate and display the combat capabilities of air defense units.
- Calculate and display system generated solution for weapon assignment, resources, equipment,...

SPECIFICATIONS

Number of concurrent targets	Up to 2000
Track update rate	≤ 5 s
Number of concurrent Flight plan Management	Up to 1000
Number of concurrent connected radar / station	Up to 50
Number of concurrent guided aircrafts	Up to 100
Time for dividing and assigning target among fire units	≤ 20 seconds
Operating systems	Linux based

- Exchange and Transmit information, commands and reports among levels.

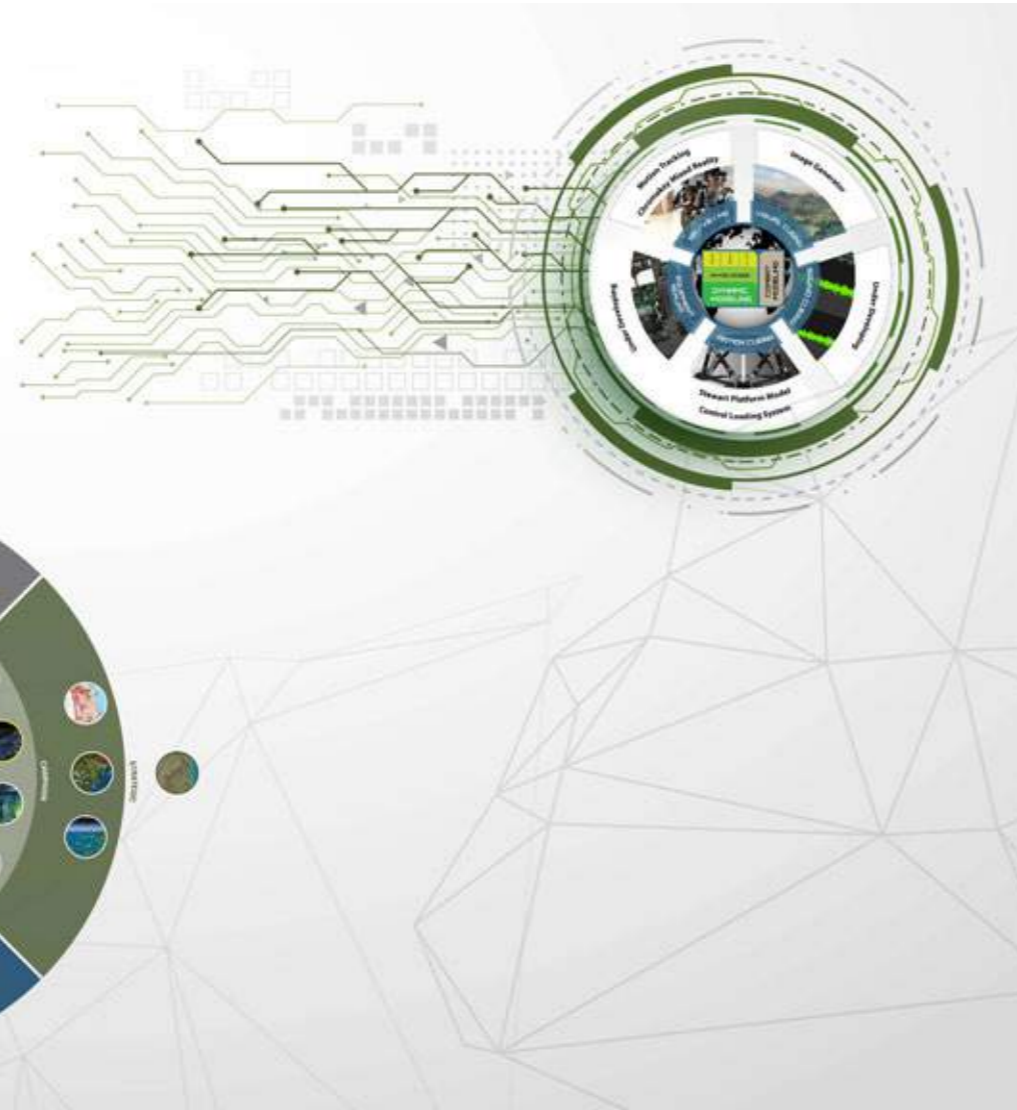
Air Force Guidance

- Calculate the air route for the Air Force.
- Direct the aircraft follow the itinerary, check safety flight information.
- Direct the aircraft to the flying objects.

Maintain and manage continuity of operations

- Create manual tracks and support training.
- Manage systems (users, combat units...).
- Support data-recording mode and re-display in two modes: Data and Video.

▶ MODELING AND SIMULATION



Viettel has researched and developed simulation systems to the 5th generation for the training and use of weapons and equipment in combat scenarios of the ground forces, air defense, navy, and electronic warfare and applications for civil fields such as education, healthcare, design, and manufacturing.

Simulation model systems researched and developed by Viettel using modeling technologies, dynamic calculations, robotics and automatic control, processing and displaying 2D/3D images, and virtual reality technologies of VR/AR/MR, aiming to design and manufacture products to meet the diverse needs of customers in the military field, as well as in the fields of education, healthcare, and manufacturing.

The products are of high quality, fully master core technologies, with features and specifications equal to or better than similar

products around the world, characterized by reasonable prices and a system of assurance, quick and timely customer care and support, and characterized in accordance with customer requirements. In addition, through self-research, building and mastering fundamental core technologies in the industry such as:

6 degrees of freedom (6DOF) .

Image Generator.

Combat modeling.

Computer Generated Forces.

Viettel's products are always well-organized, ready to expand, link, and integrate into simulation environments for advanced training or sophisticated drills.

GENERAL INTRODUCTION

Firearms Virtual Training system includes shooting technique training on the screen and tactical training using virtual reality technology platform.



KEY FEATURES

General features

- Tetherless recoil device mounted on a real gun retaining the gun's frame and trigger, without changing the size, weight, and operations. The gun frame and the trigger part was kept original. The size, volume and shooting operation was not change. AK47 has a continuous shot mode.
- High-precision ballistic trajectory model with full considerations of environmental parameters such as wind speed and direction, atmospheric pressure, and temperature.
- Tracking and simulating movements of a trainee's whole body and equipped gun, and displaying via a Virtual Reality Head Mounted Display (VR HMD)
- Customizable environmental conditions such as specific time, sunny, rainy, foggy, and windy weather, terrains, and training locations and training scenerios including properties such as time, weather conditions, terrains, allies, enemies, hostages ...
- Training scenarios management, auto scoring and result management tools.

SPECIFICATIONS

Supporting guns	K54 short gun, AK47 rifle, SVD sniper rifle
Minimum shot	Equivalent the real gun
Laser position accuracy	<1px
Number of technical training people at the same time	1-3
Number of people training tactics	3



GENERAL INTRODUCTION

Virtual Sand Table System 4.0 supports tactical planning in accordance with determined combat plans on 2D / 3D digital maps, and supports report and presentation combined with sound, images and documents, in order to show the situations of enemies and allies, intention and operational plan of the commander. The system is in service of tactical training, tactical maneuvers, and command staff maneuvers.

KEY FEATURES

- Replacing the traditional sand table with virtual 2D / 3D terrain models in a visually flexible and vivid manner with digital technology
- Building tactical plans on pre-existing maps with a standard set of military symbols
- Generating presentation materials, reporting determined combat plans.

SPECIFICATIONS	
Number of tactical plans	≥ 200
Number of military symbols	≥ 1000 symbols
Maximum area for 3D simulation	50 km x 50 km
Height map resolution	30 m/pixel
Effects supported	Platform actions (fire, explosion, smoke, movement, destruction, attack) Environment effects (wind, rain, snow, cloud, fog, day & night...) Water effects (refraction and reflection, waves, ship wakes and impacts...)



GENERAL INTRODUCTION

STANDARD driving training simulation system is a safe, economical and effective solution for car driving training.

The system uses modern devices and simulation technologies, bringing authentic experiences and interaction for students.

The system provides a variety of features and training programs that are suitable to all levels and skills of different students.

SPECIFICATIONS	
Frequency for motion simulation	≥ 60 Hz
Communication latency	< 50 ms
Transmission modes	Manual and Automatic transmission
Field of view	120°
Motion-based system	Three degrees of freedom (3DOF)

KEY FEATURES

Realistic cabin equipped with equivalent devices on real vehicles, including:

- Transmission control cluster: steering wheel, brake, throttle, acceleration pedal
- 02 sets of transmission system that can be changed in a plug-and-play manner
- Simulation screen that displays speedometer, REV counter, fuel level

Practical training program:

- Exercise with 11 standard tests, integrated a scoring program with automatic error notification
- Exercises on highways, cities, hills, muddy roads
- Allows adjustment of time conditions (day/night) and weather conditions (sunshine, rain, fog, snow)
- AI traffic allows vehicles on roads to be automatically operated

Operating and monitoring systems:

- A teacher can monitor and operate multiple cabins simultaneously
- The intuitive and friendly UI interface is written in either Vietnamese or English
- The monitoring system with a flexible 3D angle viewing around the car allows observing the whole situation
- Error notification and automatic grading

3-DOF motion-based system:

- Electrical drives ensure quick response and precise control quality
- Suitable operating space bringing realistic driving feeling for drivers.

GENERAL INTRODUCTION

The system simulates training activities for tank crew members in technical and tactical training. The system allows the implementation of exercises which fit army's battle field characteristics and fulfill the training curriculum of the Tank Amour Force.



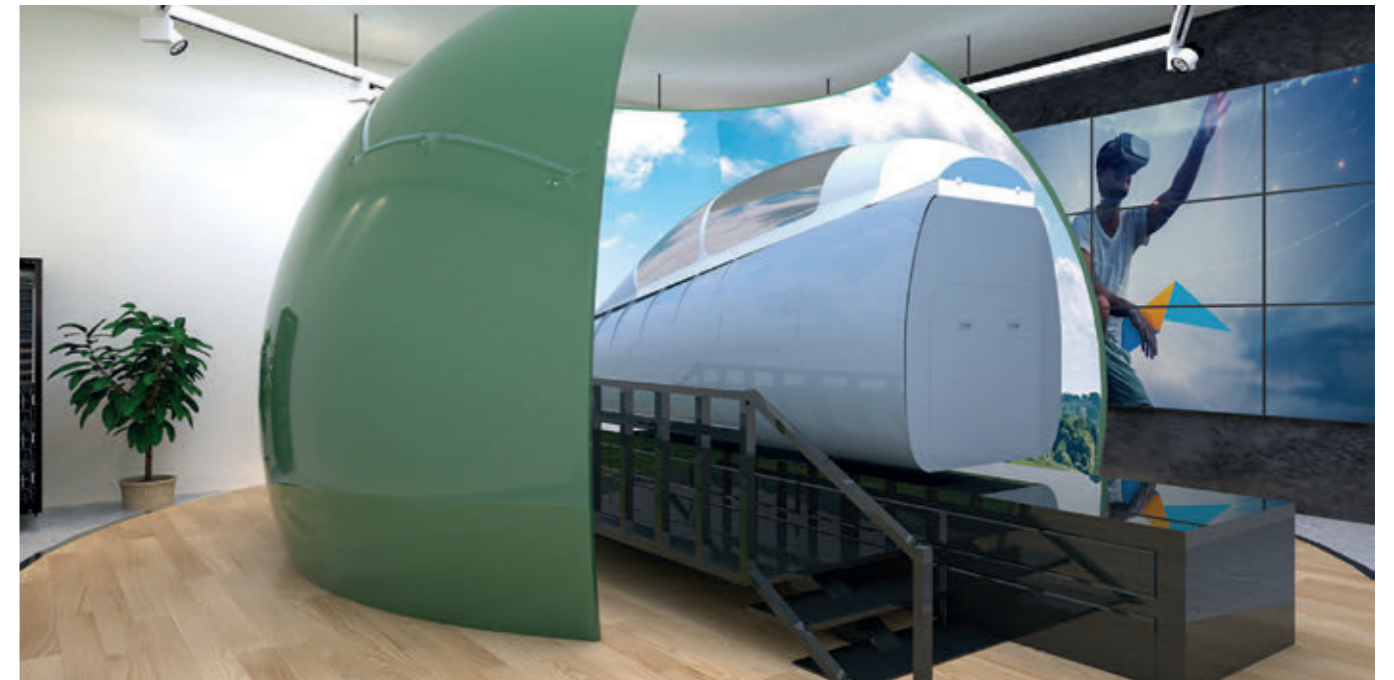
KEY FEATURES

Tank training simulation system is a perfect training system to achieve high proficiency levels in training of tank crew:

- Provide vehicle-specific, high-fidelity, operationally relevant scenarios and curriculum development to specific needs.
- Near-real simulation of the driving equipment, observation device and firepower control.
- Multi-terrain selection for different training exercises.
- Provide a scenario generation system, enabling custom scenario development for the operational environment.
- Modern graphics system with various effects (2D, 3D).
- Automatic grading and programming assessment system

SPECIFICATIONS

Quantity of simultaneously trained people	4 (driver, commander, gunner and loader)
Computing update rate	≥ 60 Hz
Motion platform	3-phase synchronous motors , 6-DoF
Map types	2D and 3D
Quantity of driving exercise	15, according training course
Quantity of firing exercise	18, according training course
Quantity of video monitors on instructor-operator station	6
Video monitor resolution	1920x1080



GENERAL INTRODUCTION

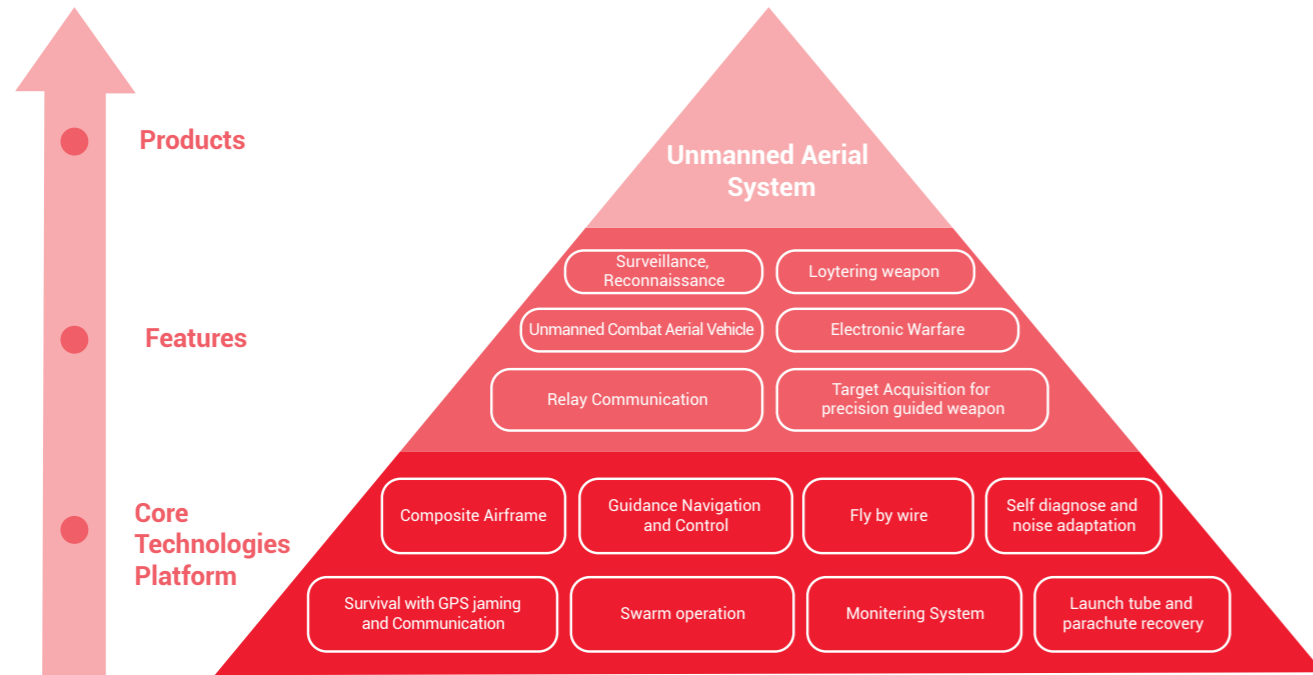
Fighter aircraft simulator is used to train pilots operating fighter aircraft. It covers all the training lessons in normal and complicated weather conditions such as flying using metering navigation system, weapon system, flying in formation and handling malfunction scenarios.

KEY FEATURES

- Cockpit equipped with full like-aircraft parts.
- Simulation of different weather conditions
- Simulation of different flight control modes: manual, semi-auto and auto pilot.
- Simulation of SUV-VEP air-to-air subsystem covering full weapons such as machine guns, bombs, rockets and air-to-air missiles, which are equipped in real fighter aircraft.
- Visual system with dome display providing wide-range Field of View.
- Simulation of different malfunction scenarios.
- Simulation of manual-control operation providing force sensation as real aircraft.

SPECIFICATIONS

Number of training lessons	163 lessons
Number of malfunction scenarios	33 scenarios
Number of weapon types	4 (machine guns, bombs, rockets and air-to-air missiles)
Field of View (FOV)	Horizontal view ≥ 200 degrees Vertical view ≥ 90 degrees
Simulation map	Vietnam
Number of weather conditions simulated	≥ 6 (wind, rain, cloud, light, time, sound)
Number of artificial effects simulated	≥ 3 (smoke, fire, explosion)



Today, Unmanned Aerial Vehicle (UAV) can perform multi-tasking from reconnaissance on the battlefield, indicating targets to taking on a role in offensive missions in many forms such as: suicide UAVs as well as UAVs equipped with missiles and bombs to destroy and prevent enemy operations on the battlefield, and are recognized as a decisive factor in modern warfare.

UAV plays an important role in the development strategy of many countries around the world, UAV not only increases the strength of the national security system but also participates in the task of economic and technical development of each country. UAV carries many advanced technologies from

aerospace, materials technology, propulsion technology, electronics, reconnaissance, intelligence, control and navigation sensors.

Viettel has researched, manufactured and supplied a combination of light unmanned aerial vehicles for military units. In the coming time, Viettel will continue to research and develop reconnaissance drones and attack drones with features comparable to advanced products throughout the world in order to suit the Army's training and combat readiness needs.



GENERAL INTRODUCTION

Light-weighted close-range UAV is using for patrol, surveillance, reconnaissance, target indication and real-time transmission to Ground Control Station. It can be equipped for Navy, Border Guard, Coast Guard...

KEY FEATURES

- Surveillance, monitor battle, target indicator and real-time transmission video to Ground Control Station.
- Search and automatic detect target, target lock.
- Waypoint, Circle and tracking target.
- Return Home in emergency case (lost link, GPS jamming).

SPECIFICATIONS	
Wing Span x Length	3,2 x 2,2 m
MTOW	26 kg
Payload	3.5 kg
Engine	Fuel
Endurance	3 h
Speed	70 - 120 km/h
Ceiling	3000 m
Operation radius	50 km
Camera	Day/night, laser range finder, HD resolution

▶ **LIGHT-WEIGHTED CLOSE-RANGE UAV
(TAKE-OFF AND LANDING BY RUNWAY OR CATAPULT)**



GENERAL INTRODUCTION

As a type of vertical take-off/landing UAV, fully automatic, maneuverable, secretly deployed in narrow spaces, leaving little trace, being capable of collecting information, indicating targets and providing real-time reconnaissance data to ground control station.

KEY FEATURES

- Surveillance, monitor battle, target indicator and real-time video to GCS.
- Fully automatic (takeoff/ landing).
- Search and automatic detect target, target lock.
- Waypoint, Circle and tracking target.
- Return Home in emergency case (lost link, GPS jamming).

SPECIFICATIONS	
Wing Span x Length	2,9 x 2,1 m
MTOW	26 kg
Payload	2.5 kg
Engine	Fuel
Quad Engine	Electric
Endurance	4,5 h
Speed	85 - 110 km/h
Ceiling	3000 m
Operation radius	70 km
Landing/Take off	Vertical fully Automatic
Camera	Day/Night, HD resolution





GENERAL INTRODUCTION

Military grade desktop is used in office, performing various of tasks, such as: editing documents, inputting data, exploiting and using internal and shared software on the military network

This equipment qualifies the tactical and technical features of a dedicated computer, specialized in defense mission.

SPECIFICATIONS

Monitor	21.5 inches, FHD 1920x1080
Processor	Intel Core i7, 7600 U, 2.86 GHz, 4 MB Cache, Dual core, 4 threads
RAM Memory	RAM DDR4, 8 GB (can be upgraded)
Storage	SSD SATA 3.0, 1 TB
I/O Ports	Gigabit LANx1, USB3.0x2, USB2.0x2, HDMIx1 (1080p resolution)
Operating system	Window 10 Pro or Self-developed operating system
UPS	Remaining for 2 hours
Operating environment	Operating temperature: from -10°C to 50°C; Relative humidity: from 0 % to 95 %
Anti electromagnetic interference	• Qualified MIL STD 461F standard (methods: CE101, CE102, CS101, CS106, RE101, RS101)
Confidentiality	Supporting TPM2.0, UEFI BIOS, encrypting all data stored on hard drive, preventing unauthorized access
Safety & Security	Qualified required safety and security standards



GENERAL INTRODUCTION

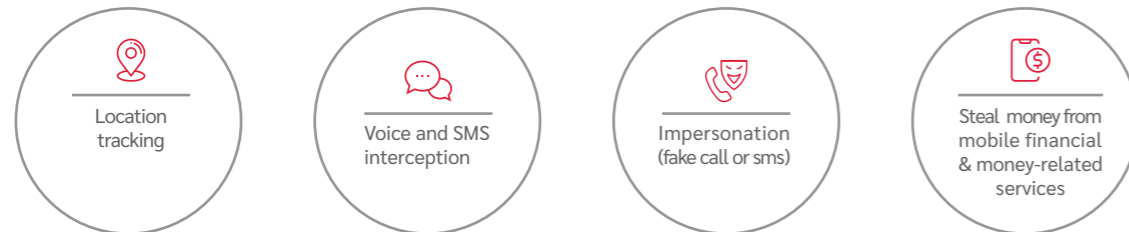
Military grade laptop is used in office, performing various of tasks, such as: editing documents, inputting data, exploiting and using internal and shared software on the military network

This equipment qualifies the tactical and technical features of a dedicated computer, specialized in defense mission.

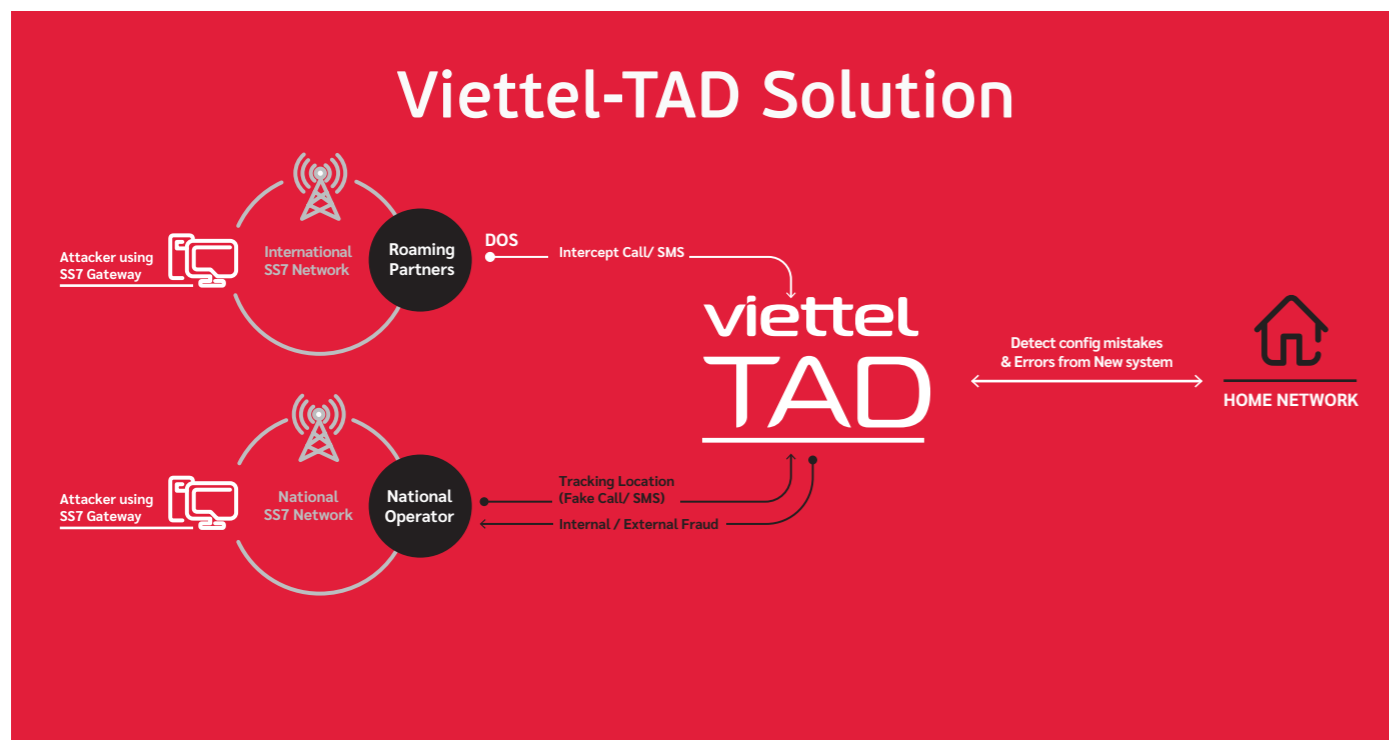
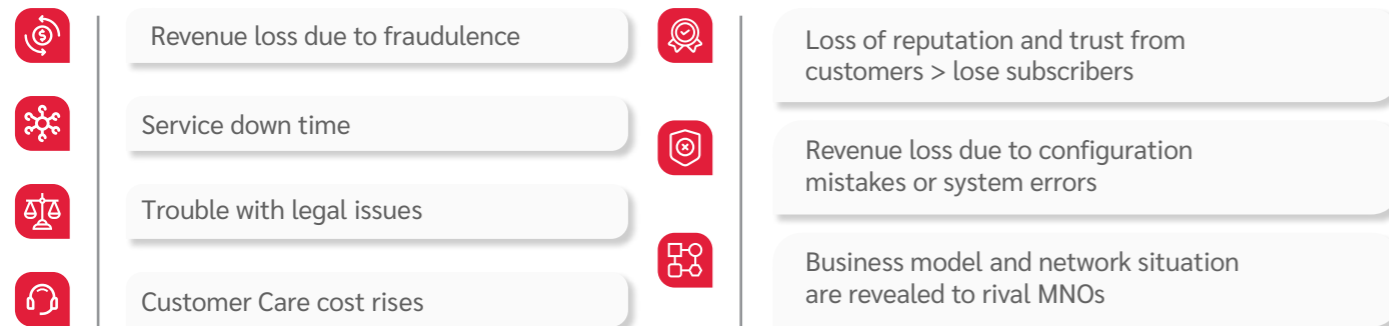
SPECIFICATIONS

Monitor	13.3 inches, FHD 1920x1080
Processor	Intel Core i7, 7600U, 2.86 GHz, 4 MB Cache, Dual core, 4 threads
RAM Memory	RAM DDR4, 8 GB (can be upgraded)
Storage	SSD SATA 3.0, 1TB
I/O Ports	Gigabit LANx1, USB3.0x2, USB2.0x2, HDMIx1 (1080p resolution), VGAX1
Operating system	Window 10 Pro or Self-developed operating system
Battery	Li-ion battery up to 4 hours without encryption module, up to 3 hours with encryption module
Operating environment	Qualified some requirements of MIL-STS-810G and IP65
Anti electromagnetic interference	• Qualified MIL STD 461F standard (methods: CE101, CE102, CS101, CS106, RE101, RS101)
Confidentiality	Supporting TPM2.0, UEFI BIOS, encrypting all data stored on hard drive, preventing unauthorized access
Safety & Security	Qualified required safety and security standards
Camera	5 MP (with cover)
Weight	4.5 kg

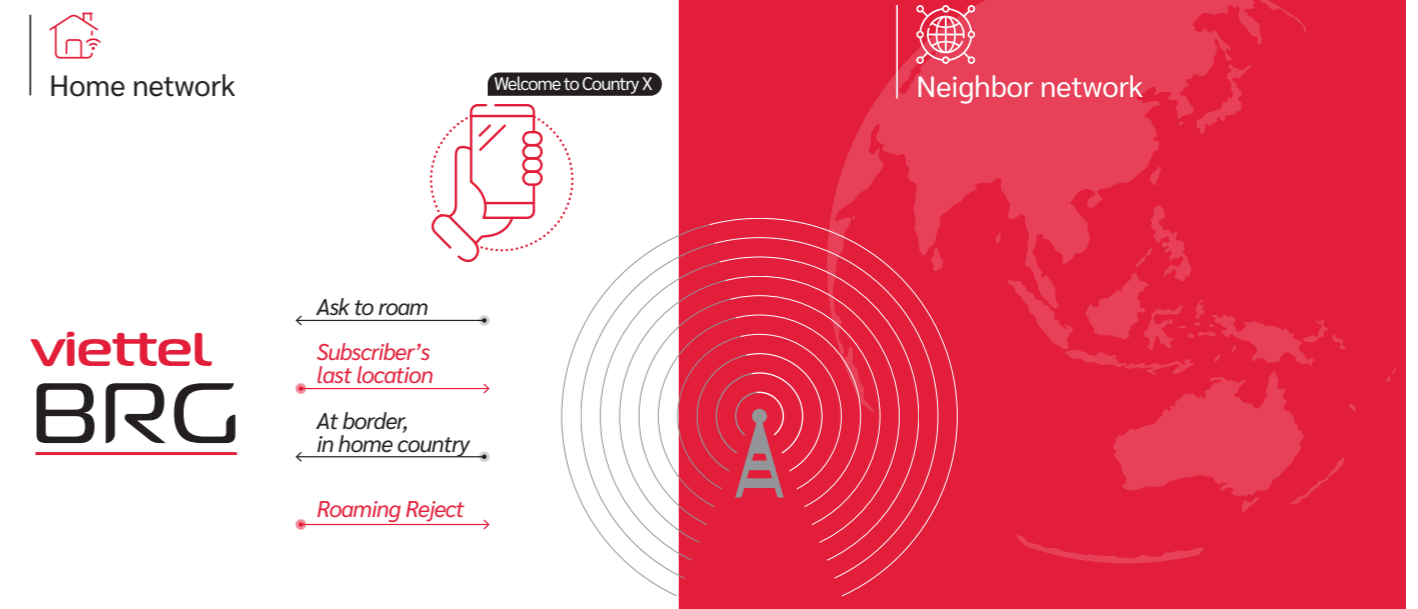
Risks Subscribers



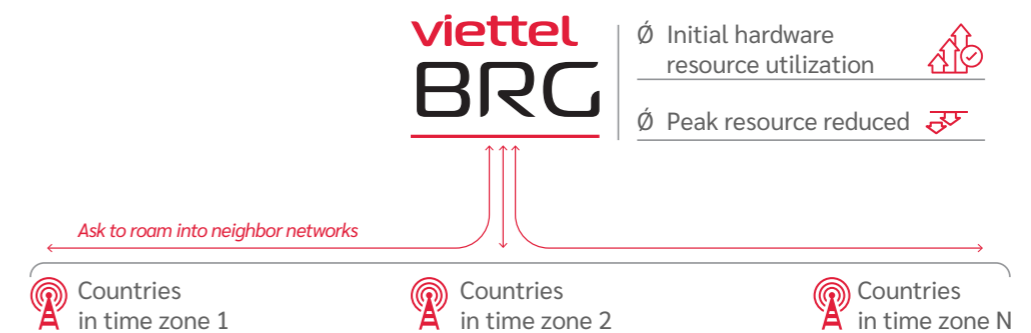
Risks Mobile Network Operators (MNO) suffer from



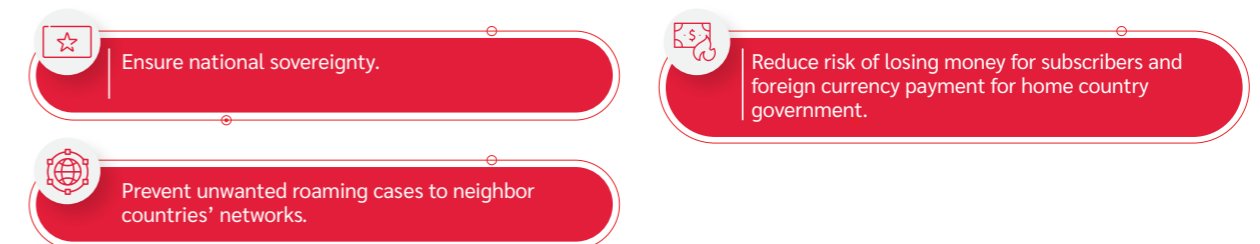
Demand for Border Roaming Gateway



Viettel Border Roaming Gateway



Benefits



viettel

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