D7G

DEFENCE INDUSTRIES CORPORATION OF NIGERIA

Sustaining Global Defence Productions

D7G

"
Sustaining Defence Production, **and** enhancing transfer of technology.
"

Air Defence and Border Security

Provide the best of
DICON D7G Company
Arms Industry,
Stocks and Production

Air Defence
and Border Security

Air Defense Systems

ŞAHİN
40 MM HARD-KILL SYSTEM

> REMOTE CONTROL
> AUTOMATIC TARGET DETECTION AND TRACKING
> HIGH ACCURACY STABILIZATION
> FIRE CONTROL ALGORITHMS
> 40MM HIGH SPEED AIRBURST AMMUNITION USE
> EFFECTIVE AGAINST MINI/MICRO UAVS
> ADVANCED USER INTERFACE

İHTAR
MOBILE ANTI-DRONE SYSTEM

> RADAR SYSTEM
> RF COUNTERMEASURE SYSTEM
> ELECTRO-OPTIC SYSTEM
> COMMAND AND CONTROL SYSTEM

AURA-200G

Multifunction Surveillance Radar

SYSTEM FEATURES

- Active Electronically Scanned Array (AESA) Antenna
- 3D, Multiple simultaneous detection and tracking
- Instrumented Range: > 25 km
- High accuracy and resolution
- Adaptive and High Update Rate
- Single Antenna 90°; 4 Antenna suit 360° Continuous Scanning and Data Fusion
- Multi-target tracking & automatic target classification
- User Defined Alarm/Friendly Zone Selection & Sector Blanking
- Remote Control & Digital Map Overlay

- Integration to electrooptics and jammers
- Multi-mission modes and Integration to V-SHORAD Applications
- TCP/IP Ethernet Interfaces
- MIL-STD-810G and MIL-STD-461F

25 KM

Aslan 150M2/G

UNMANNED
GROUND VEHICLE
Medium-Sized

Capabilities

3000 kg
Weight

20 km/h
Maximum Speed

Hybrid Motor

Armor Protection

240 cm
Length

210 cm
Width

SARP Dual Weapon System

Telescoping Surveillance System with Mast

Remote Control of All Functions

Autonomous Mobility
and Mission Capabilities

Wireless/Wired and
4G/LTE Communication

Countermeasure with
Smoke Grenade Launcher
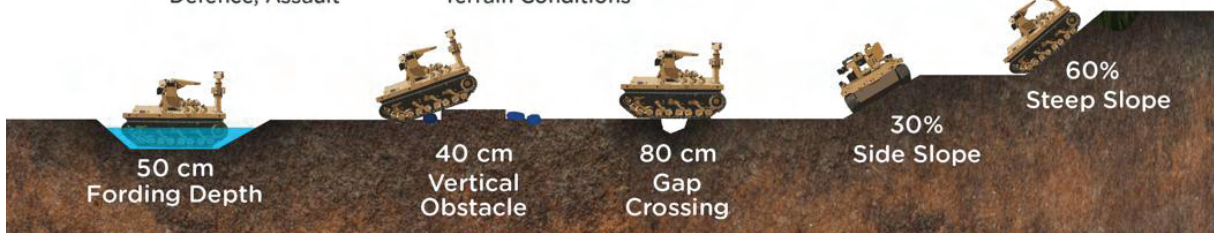
Backup Power Unit (Generator)

Load Case and Load Carrying Kit
for Logistics Purposes

Carrying Trailer and Lifting Lugs for
Transportability Purposes

Target Acquisition,
Border/Facility Security,
Defence, Assault

Enduring for Harsh
Environmental and
Terrain Conditions

50 cm
Fording Depth

40 cm
Vertical
Obstacle

80 cm
Gap
Crossing

30%
Side Slope

60%
Steep Slope

Lenght: 1838 mm

Height: 1022 mm

Width: 856 mm

kg Weight 650 kg

Time for First Fire: < 60 seconds

Range: 500 m ≤ x ≤ 5900 m

Rate of Fire: 15/min

Elevation: 45° - 85°

Azimuth: ± 195°

81 mm MORTAR WEAPON SYSTEM

- Indigenous and Original Design
- Modern Weapon System Integrated into the Turret
- Automatic Weapon Aiming System
- Recoil Mechanism
- Fire Control System

- Integrated into Tracked Vehicles, Tactical Wheeled Vehicles and Stationary Platforms
- Ability to Work Integrated with Command Control Systems
- Precise Position and Barrel Laying Detection with Inertial Navigation System
- Ammunition Muzzle Velocity Detection through Muzzle Velocity Radar
- Ability to Use Different Types of Ammunition
- Resistant to Harsh Environmental and Terrain Conditions

ALP 300-G

Early Warning Radar System

ALP 300-G, is a new generation S-Band radar developed for long range early warning, with its AESA and digital beamforming antenna architecture. ALP 300-G has the ability to detect and track air breathing targets, ballistic missiles, anti-radiation missiles and stealth/low RCS targets from very long ranges.

AESA and Digital Beam Foming architecture together with Multi Channel Receivers allows to produce simultenous beams in space paving the way for multi-function and multi-mission operations. ALP 300-G uses weather information to optimize its detection and tracking performance. ALP 300-G is a highly mobile standalone system with its radar, command control/communication and power systems on tactical trucks without mounting/demounting operations for deployment and marchorder. ALP 300-G can be connected to radar networks and can exchange 3D air picture among different ALP 300-G systems and the Air Force command centers thru radios, radio links and army backbone thru AWCIES messaging. ALP 300-G can perform data fusion and track handover amongst themselves, which is a critical feature especially for ballistic missile defense. A long range Mode 5 IFF interrogator is integrated with a high gain IFF antenna to cooperate with radar's operational modes. ALP 300-G AESA arhitecture and modular design approach support the concepts of high availability and low cost maintenance. ALP 300-G, has several ECCM features such as frequency / time agility, low side lobe levels, jammer strobe and nulling, side lobe blanking, to name a few.

Operational & Tactical Specifications

- Effectiveness against a broad set of threats at long range
- Detection and Tracking of Targets with Very Small RCS at Long Range
- Detection and Tracking of Ballistic Missiles
- Electronic Scanning in Azimuth and Elevation
  State of the Art Solid-State Power Amplifier Technology
- Digital Beamforming
- Target Classification Capability
- Various Tactical Operation Modes
  Long Range Mod5/S IFF System (Compatible with NATO STANAG-4193)
- Local and Remote Radar Control
  Performance Evaluation Subsystem
- Integration with the National C2 Systems and NATO Air Command and Control System (ACCS)
- Integration with the Air and Missile Defense Systems
- Compliance with the Tactical Communication Networks
- Advanced Electronic Protection Measures and Cyber Security
- Counter Measures against Anti-Radiation Missiles
- Portability with 10 Ton Class Tactical Wheeled Vehicles (TWV)
- Transportable with C130/A400M
- 24/7 Operation
- 3000 Hours MTBCF
- %99.9 Availability
- 30 Minutes Deployment and March-Order Time
- Advanced Built-in Test (BIT) Capabilities
- 30 Minutes MTTR
- Endurance to Harsh Environmental Conditions (MIL-STD-810G)
- Advanced Algorithms for Windfarm Mitigation

ALP 110-G

Multifunction Aesa Air Surveillance Radar System

ALP 110-G is a multifunction AESA Air Surveillance Radar System that can be used not only as the main search radar for the ground based air defense systems but also as a gap filler radar to cover the areas which cannot be covered by other long range radar systems.

System can perform target detection and tracking functions within medium/long range (>100 NM) and low/ medium/high altitude and can identify targets by using its onboard Secondary Surveillance System (Mod-5/S capable).

Improved system mobility is one of the main advantages of the being integrated on 8x8 tactical wheeled vehicle including power generator and communication equipment. System is compact enough to be transported by an A400M aircraft.

Two operators can prepare the system for transport or operation within 15 minutes.

The system has the ability to detect and warn for ballistic objects such as Rocket Artillery and Mortar (Sense and Warn). System offers a dedicated mode for weapon locating, reporting point of launch enabling precise counter-fire and generating automated alarms by calculating point of impact.

Features

- 3D Detection and Tracking Fighters, Helicopters, Hovering Helicopters, Unmanned Air Vehicles (UAVs), Cruise Missiles

- Multiple target tracking

- Classification of targets

- Identification of targets with integrated

- Mode-5 IFF

- Jammer direction finding

- Remote operation with Command Control System

Technical Specifications

- Operating Frequency   : S-Band
- Instrumented Range   : > 110 NM
- Target Track Capacity   : > 1000
- Azimuth Coverage   : 360°
- Elevation Coverage   : -6° / +70°

Medium Range Air and Missle Defense System

MEDIUM RANGE AIR AND MISSILE DEFENSE SYSTEM

HISAR O 100 Medium Range Air and Missile Defense System, dedicated to protect stationary forces and high value assets, is the Türkiye's first air and missile area defense system in a distributed and flexible architecture.

FEATURES

- Effective Air Defense Execution with Distributed Architecture and Flexible Deployment
- 360° Threat Destruction via Vertical Launcher
- Target Interception with IIR and RF Missiles
- Multiple Engagement and Successive Firing
- Threat Evaluation and Weapon Assignment
- Operation In Day, Night and Adverse Weather Conditions

Specifications

- System Interception Range: **> 25 Km**
- System Interception Altitude: **> 15 Km**
- Number of Tracks: **> 60 Targets**
- Ready-to-fire Missile: **18**

LINK-16

HİSAR O 100
MEDIUM RANGE AIR AND MISSILE DEFENSE SYSTEM

Medium Range Air Defense Radar

Electro-Optical System

Missile Launching System

Tactical Data Link Connection System

Missile Launching System

Fire Control Center

Missile Launching System
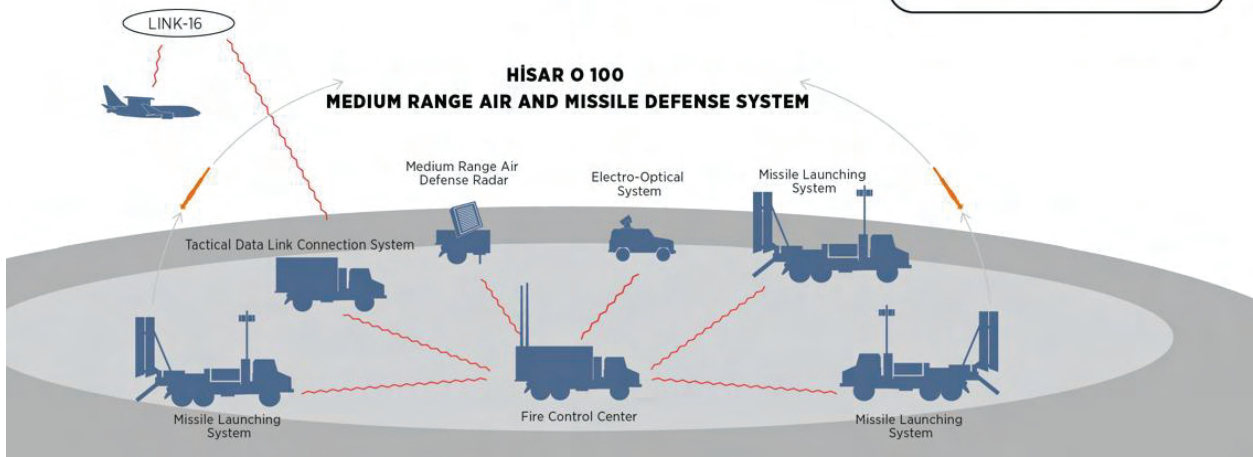
HISAR O+

Medium Range Air Defense Missle System

Air Defense of Stationary Forces and Critical Assets Target Interception with IIR and RF Missles Multiple Engagement and Successive Firing Threat Evaluation and Weapon Assigment Operation in day, night and adverse weather conditions mobility in tactical area.

HISAR O+ Medium Range Air Defense Missle System is dedicated to air defense of Stationary Forces and Critical Assets against:

- Fighters
- Helicopters
- UAVs
- Cruise Missiles
- Air to Surface Missiles

HISAR O+ performs target detection, classification, identification, tracking, command & control and fire control functions in a distributed and flexible architecture.

One HISARO+ Battery consists of battery level FCC, battery level Radar, Electro-Optical System, TDLCS and Missile Launching Systems. HISAR O+ Battery has the capability of target detection,tracking, identification and performing command & control and fire control functions autonomously. HISARO+ is organized in battalion level and consists of battalion level Fire Control Center (Battalion FCC), battalion level Radar, three HISAR O+ Batteries, Tactical Data Link Connection System and Support Vehicles. Battalion FCC produces Integrated Air Picture using track information provided by battalion level Radar and Air Defense Batteries in the Battalion, performs threat evaluation and assignment for Batteries.

HISARO+ Medium Range Air Defense Missile System is state of Medium Range Air Defense Missile System is state of future technology.

Features

- Effective Air Defense Execution with Distributed Architecture and Flexible Deployment .
- Air Defense mission planning at battery and battalion level.
- Management and distribution of command and control information.
- Integrated air picture generation.
- Target Interception with IIR and RF Missiles.
- 360° Threat Destruction via Vertical Launcher.
- Multiple engagement and successive firing.
- Data Link for midcourse guidance.
  Operation in day, night and adverse weather conditions.
- Global positioning system and navigation.
- Remote control.
- Wired or wireless communication between systems.
- Work in coordination with Turkish Air/Naval/Land Forces command and control units using Link 1/Link 11B/Link 16 tactical data links and JREAP.
- Automatic target tracking and shooting with using EO sensors.
- Identification Friend or Foe (IFF).
- Threat Evaluation and Weapon Assignment.
- Multi Target, Multi Radar Fusion.
- Embedded Simulation.
- Built-in test, Effective ILs and maintenance.

Specifications

System Interception Range	: 25 km
Ready-to-Fire Missile	: ≥ 18 (Battery Level)
	: ≥ 54 (Battalion Level)
Fighter Detection&Track Range	: 40-60 km
Number of Tracks	: > 60 targets

SIPER

Long Range Air and Missile Defense System

- LONG RANGE AIR DEFENSE of strategic facilities against enemy attacks
- Distributed Architecture
- Close and Remote deployment capability
- Multiple engagement and successive firing
- Ability to operate in coordination with Air/Naval/Land Forces command and control units using tactical data links
- Transportation capability with land, air, naval and railroad
- Connection with Radar Network and HvBS

SİPER Long Range Air and Missile Defense System is effective against:
- Air Breathing Targets
- Cruise Missiles
- Air to Surface Missiles
- UAV's

SİPER System consists of:
- Command and Control Level
- Command and Control Center
- Long Range Surveillance Radar

Battery Level
- Fire Control Center
- Fire Control Radar
- Missile Launching System
- Missile Transport Loading System
- Long Range Missiles
- Communication Systems
- Support Equipment's and Class Type Training Center
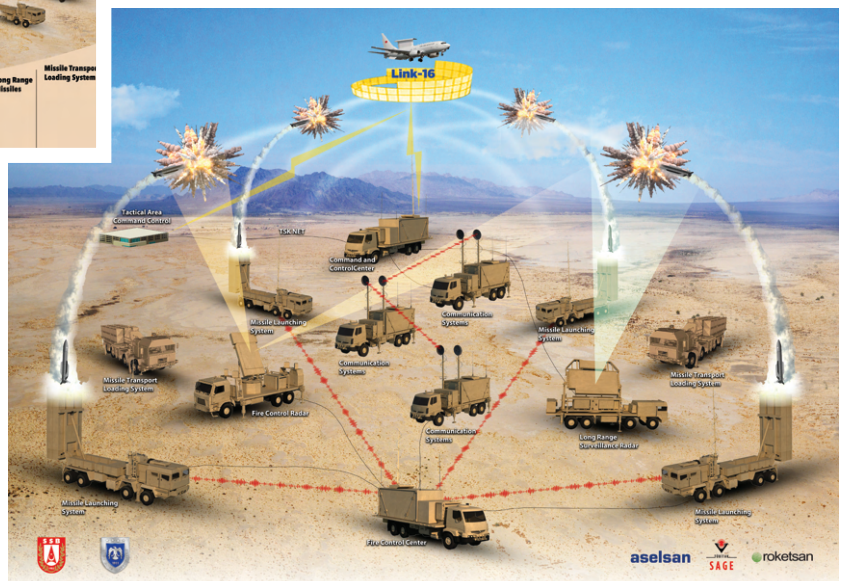
Specifications

- System Max. Interception Range : 150 km
- System Interception Altitude : 0.1-30 km
- Coverage : 360°
- Number of Tracks : 100
- Battery Level Engagement Capability : 10
- Battery Level Missile Guidance Capability : 20

Features

- Air Defense mission planning and coordination
- Management and distribution of command and control information
- Integrated air picture generation
- Multiple engagement and successive firing
- Manual/Semi Automatic/Automatic engagement capability
- Identification Friend or Foe (IFF)
- Automatic diagnosis management
- Threat evaluation and weapon assignment
- Multi-Target Multi-Radar fusion
- Data Link (Uplink and Downlink)
- Terminal guidance with RF Seeker
- RF Target Detector
- Highly effective Warhead
- Wired or wireless communication between systems
- Vertical/Oblique launching capability
- Radar Network and HvBS connection capabilitiy
- Operation in day, night and adverse weather conditions
- Ability to operate in coordination with Air/Naval/Land Forces command and control units
- Embeded Simulation
- Ability to operate with 6 missiles on the Missile Launching System
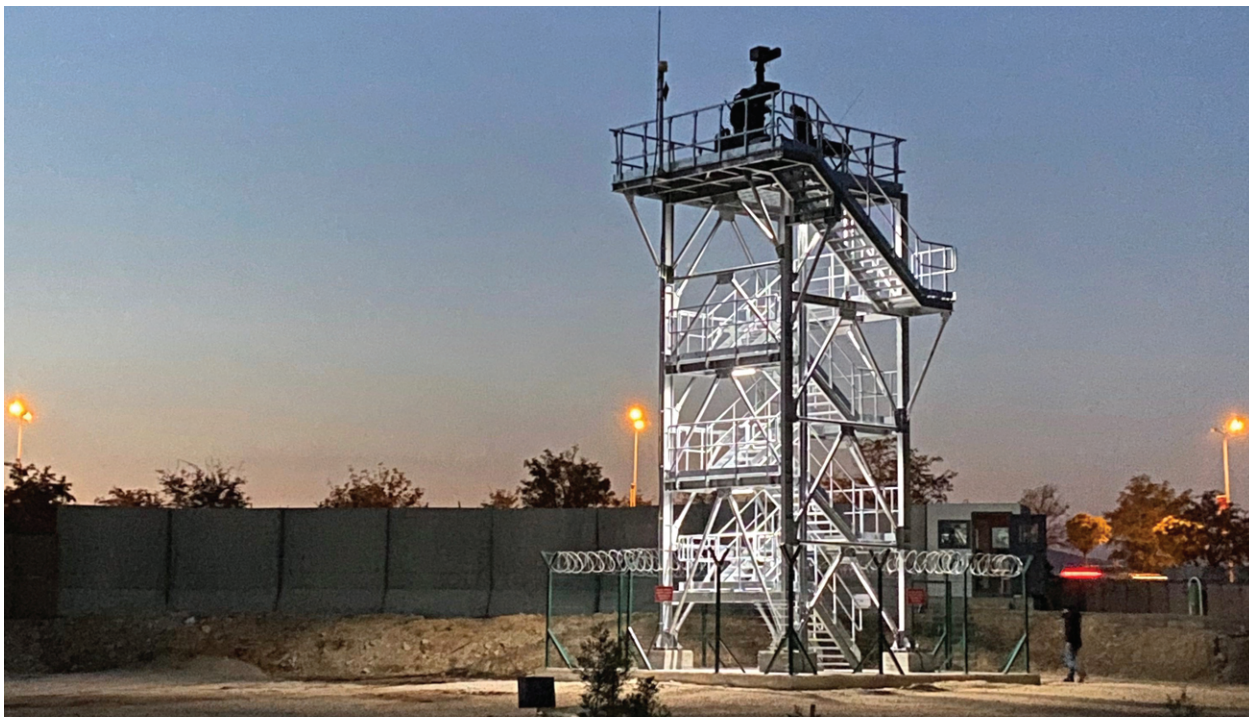- Solid propellant propulsion system (monobody)

İHTAR
ANTI-DRONE SYSTEM

ASELSAN's Anti-Drone System, aims to neutralize mini and micro UAV threats in urban and rural environments. It is used for protection of critical facilities, prevention of illegal border infiltration and safety of highly populated events.

General Specs

- Detecting and tracking multiple UAVs with high accuracy using portable radar
- Low false alarm rate
- Recognizing the threats from a distance using
- TV/Thermal cameras
- Automatic video tracking
- Directional jamming capability for specific threats
- Omni directional jamming capability for swarm attacks
- Ability to switch to preloaded jamming frequency groups
- Software programmable jamming frequencies
- Requires minimum operator intervention
- Built-in-Test (BIT) capabilities
- Operating in all-weather conditions for 7/24
- Customizable with its open and modular architecture
- Compatible with military standards
- Easy to include other means of sensors (acoustic drone detection system, direction finding (DF) system) and effectors (Unmanned air vehicle (UAV) hard kill system, Laser defense system)
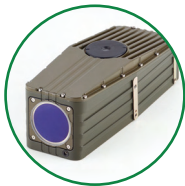- Compatible to work with TAFICS infrastructure

ACAR Radar System

- Ku-band Pulsed Doppler Radar with Pulse Compression
- Track-While-Scan (TWS) mode
- Multi-target tracking, Automatic target tracking
- 360° Continuous or Sector Scanning,
- 30 rpm rotation speed
- Automatic Target Classification
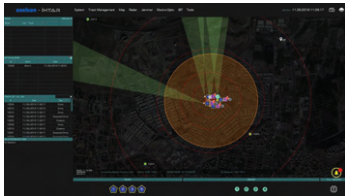- 40° instantaneous elevation coverage Adjustable Sector Width

GERGEDAN RF Countermeasure System

- Programmable RF Jammer System
- Active jamming of RFEYP trigger frequencies of radios, remote controls, mobile phones (2G, 3G, 4.5G/LTE, WI-FI) and GNSS, remote control, data/image/video transmission frequencies of Drones/Mini-Micro-UAVs in the entire radio frequency band.
- Protection against swarm threats with codirectional antenna set
- Type of antennas: with directional/co-directional antenna, antennas hidden inside the roof rack.

GÜNGÖR/DÖRTGÖZ Electro-Optic Systems

- The third-generation thermal imaging system DÖRTGÖZ developed for long distance surveillance and reconnaissance, can perform many tasks such as border surveillance, tactical reconnaissance, coast guard, facility security, long distance surveillance under all weather conditions day and night.
- GÜNGÖR HD is a family of high-definition daytime cameras; used for long-range surveillance and reconnaissance, fixed and mobile security applications, situational awareness, air defense applications and security units.

Command and Control System

- Centralized Command & Control capabilities with integrated GIS, alarm zones, filtering etc.
- Air picture generation
- Decision support algorithms
- Sensor fusion and auto-tracking
- Threat evaluation and effector allocation algorithms
- Centralized command & control of all sensors and effectors
- Integration of new sensors and systems with open architecture feature

PUHU-UAV
MINI/MICRO UAV DETECTION AND DIRECTION FINDING (DF) SYSTEM

MINI/MICRO UAV DETECTION AND DIRECTION FINDING (DF) SYSTEM

PUHU-UAV detects mini/micro UAVs (drones) & Remote Controllers within its line-of-sight and classifies them according to its threat library. The compact system design enables the system to be installed easily to any facility.

PUHU-UAV provides excellent solution for users with its highly accurate line of bearing (LOB) results, signal processing capabilities and special DF algorithms. The System uses correlative interferometer method (AoA) to find the LOBs.

 PUHU-UAV is able to work at night, in foggy and bad weather conditions with its RF detection technology.

PUHU-UAV can simultaneously detect multiple threats (swarms) which are approaching from different sectors, controlled at different frequencies.

 The system can locate the target on a digital map by combining the LOB results of 2 or more systems.

PUHU-UAV can be controlled via laptop with its specially designed user interface for drones.

PUHU-UAV can detect the Remote Controller activities within its line of sight, even before take off, so can also act as an Early Warning System.

Command and Control System

- Drone/Mini-Micro UAV and Remote Controller detection and accurate classification supported by Threat Library
- Situational awareness provided by real-time spectrum monitoring of all relevant drone frequency bands
- Direction finding (DF) of drones and remote controllers within its line-of sight
- Correlative interferometer method (AoA)
- 2D location fixing of drones and remote controllers with 2 or more systems, 3 systems are recommended for best triangulation performance
  Fixed site configuration for the protection of critical facilities, borders, private and government facilities, airports, etc.
- Built-in-test (BIT) feature
- Supports digital maps
- 7/24 operation from the mains supply with AC adapter
- Low power consumption

Technical Specifications

Frequency Coverage	: V/U/SHF (*)
DF Accuracy (clear site)	: 3° RMS typical
Instantenous IF Bandwidth	: 80 MHz
Antenna Coverage (azimuth)	: 360°
Antenna Coverage (elevation)	: 60° (-30°/+30°)
Power Consumption	: < 200 Watt
MIL-STD 810 compliant	
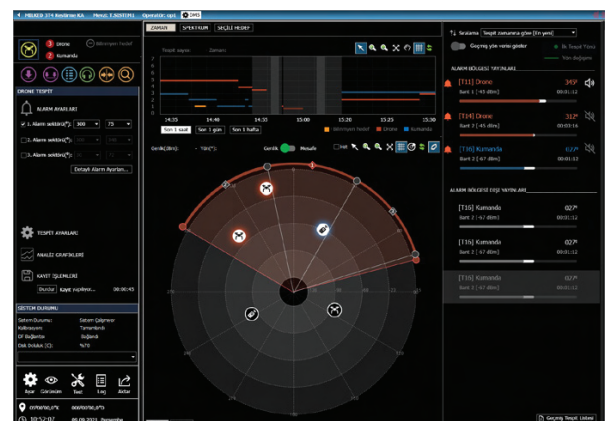
(*) SHF partial; you can contact us for more information. System covers all known RC frequency bands.

HISAR

Missile Launching System

HISAR Missile Launching System is a multi purpose missile launcher which uses short and medium range air defense missiles.

AIR DEFENSE OF STATIONARY/MOVING FORCES AND CRITICAL ASSETS

LAUNCHES SHORT RANGE MISSILES UNDER CONTROL OF KORKUT-FIRE CONTROL SYSTEM

LAUNCHES MEDIUM RANGE MISSILES UNDER CONTROL OF HISAR O+ AIR DEFENCE SYSTEM

HIGH MOBILITY

HISAR Missile Launching System is a multi purpose missile launcher which deploys and launches short and medium range HISAR Air Defense Missiles.

HISAR A+ Missile Launching System, configured as a short range air defense missile launcher, operates under control of KORKUT-Fire Control System which provides coordinated operation of 35 mm towed guns and Missile Launching System.

HISAR O+ Missile Launching System, configured as a medium range air defense missile launcher, is controlled by HISAR O+ Fire Control Center which supervises three launchers within an air defense battalion.

HISAR Missile Launching System is a state of the art technology and has open HW&SW architecture for utilizing future technology.

Specifications

System Interception Range : 15 km (HISAR A+), 25 km (HISAR O+)
Ready-to-fire Missile : 6
Max Road Speed : 65km/h
Gradient : 60%
Side Slope : 30%

HISAR Missile Launching System are dedicated to air defense of Stationary/Moving Forces and critical assets against:

- Fighters
- Helicopters
- UAVs
- Cruise Missiles
- Air to Surface Missiles

Features

- Multi purpose missile launcher
- Multiple engagement and successive firing
- Data Link for midcourse guidance
- Operation in day, night and adverse weather conditions
- Global positioning system and navigation
- Remote control
- Mobility in tactic area
- Fast deployment and short startup-time
- Automatic leveling system
- Effective ILS and maintenance

MEERKAT

Manpack Integrated Drone Dtetection & Jamming System

IHASAVAR Anti Drone Jammer Subsystem

- Providing protection against Drone/Mini-Micro UAV threats with manual active jamming with threat detection of MEERKAT Subsystem
- Jamming for Drone/Mini-Micro UAVs; remote control frequencies, GNSS frequencies (GPS L1, GLONASS L1, GALILEO E1 and BEIDOU B1) and data link/telemetry frequencies
- Software defined jammer
- Programming of more than 100 different jamming profiles
- Fully Programmable State-of-Art Digital Frequency Synthesizers
- Control and monitoring of the System by Remote Control Unit
- Operation Time: 1.5 hour from the Batteries
- Easy-to-use with user friendly interface
- Compact system architecture
- Built-in VSWR protection
- Built-in test feature
- MIL-STD-810 compliant

MEERKAT- Detection Subsystem

- Drone/Mini-Micro UAV and Remote Controller detection and identification supported by Threat Library
- Control opportunity from Android Based Devices (Mobile Phone, tablet)
- Easy to use with user friendly interface
- Real-time spectrum monitoring of all relevant drone frequency bands
- 360° detection with omni-directional antenna
- Usability in combination with the IHASAVAR system
- MIL-STD-810 compliant
- Operation Time: 1.5 hour

KANGAL ™

Drone - Mini/MIcro UAV & Rcied Jammer System

KANGAL™ Drone - Mini/Micro UAV & Rcied Jammer System is designed to protect Convoys, VIP vehicles in motion against Radio Controlled Improvised Explosive Devices (RCIED) and protect military bases, facilities, high value assets, ceremony/meeting/demonstration areas and checkpoints against Drone - Mini/Micro UAVs.

KANGAL™ covers the whole Radio Frequency (RF) band and applies active jamming on RCIED triggering frequencies of Radios, Remote Control Devices, Mobile Phones (2G, 3G, 4G/LTE,Wifi) and frequency bands of Remote Control, GNSS (GPS/GLONASS/ Galileo), Data Link and Image/Video Forwarding Modules of Drone - Mini/Micr UAVs simultaneously.

KANGAL™ uses omni-directional antennas and specially designed antenna patterns to create 360° protection to defeat ground threats such as roas-side RCIEDs and to form a semi-spherical protection umbrella to defeat even fleet attacks (multiple DRONE - Mini/Micro UAVs approaching from different directions).

KANGAL™ is operate for unlimited durations powered via vehicle alternator or an additional Alternator or for a limited time via system batteries.

KANGAL™ is a vehicle independent system being able to be installed on any type of vehicle (e.g. armored/unarmored SUVs, pickups and military trucks).

KANGAL™ is a Software Defined Jammer System and its programmability features provide the user with utmost customization flexibility to specific operational and tactical requirements. User defined "jamming profile" includes setting of numerous jammed frequency bands and output power levels for simultaneous jamming of multiple threats. New jamming waveforms can quickly and easily be added to the system to counter new threats and region specific threats. Dynamic Communication Channels can be programmed to provide friendly force communication during jamming.

Technical Specifications

- **Application Type:** Convoy Protection, VIP Vehicle Protection against RCEIDs, Static Infrastructure, Area/Zone Porotection against Drone - Mini/Micro UAVs.

- **Frequency Coverage:** Whole Radio Frequency (RF) Band (Configures and prioritized according to user requirements).

- Software Defined (Programmable) Jammer (Configurable according to Operatoinal and Tactical Requirements).

- **Jamming Type:** DDS-Based FPGA-Controlled Swept Jamming.

- **Antenna Type:** Omni-Directional Antennas

- **Antenna Pattern:** Semi-spherical

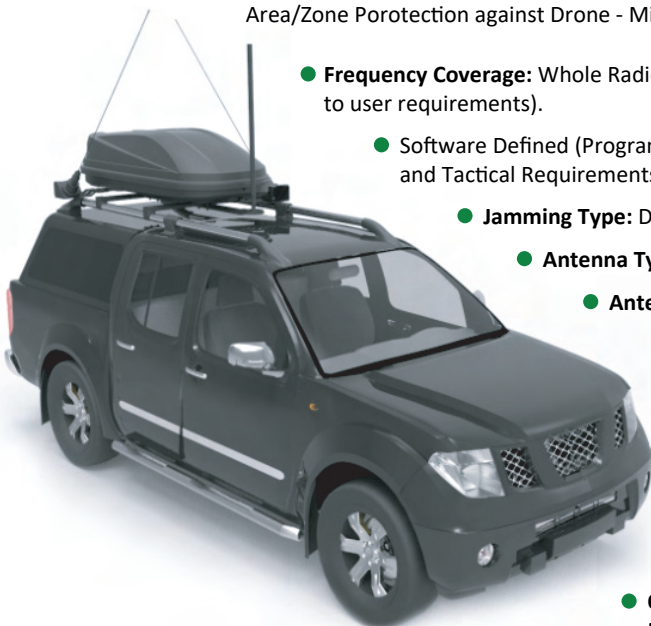- **RF Output Power:** <450 Watt

- **Power Source & Operation Time:**
  - Continuous Operation via Vehicle Alternator
  - At least 1 hour via Batteries

- **Weight:** <25kg (RF Jammer Unit)

- **Electric Field (SAR):** Compatible with ICNIRP standards (Human Safe).

- **Other Environmental Conditions:** Compatible with MIL-STD-810G/F Conditions (Humidity, Rain, Sand, Shock, Vibration).

MEERKAT ™

Integrated Drone detection & Jamming System

### Meerkat™ Detection System

- **Frequency Range:** UHF and SHF (partial) [1]

- **Antenna Type:** Directional and Omni-Directional

- Drone/Mini-Micro UAV detection and identification [2]

- Fixed site configuration for the protection of critical facilities, borders, private and government facilities, airports, etc.

- Ability to work at night and all adverse weather conditions with its unique RF detection technology.

- Easy to use with user friendly interface.

- Spectrum monitoring of all relevant drone frequency bands.

- Ability to simultaneously detect multiple threats (swarms) from different sectors controlled at different frequencies.

- Direction/sector finding (DF) of drones by using the directional antenna set.

- 7/24 operation from the mains supply.

- Ability to be integrated with IHASAVAR™ Anti-Drone RF Jammer System in a co-operative manner.

- MIL-STD-810 compliant.

(1) SHF partial; you can contact us for more information.
(2) Identification feature is supported only for threats that are listed in our Threat Libraray.

IHASAVAR™ Anti Drone Jammer Subsystem

- Providing protection against Drone/Mini-Micro UAV threats with automatic or manual active jamming with threat detection of MEERKAT Subsystem.

- Jamming for Drone/Mini-Micro UAVs; remote control frequencies, GNSS frequencies (GPS L1, GLONASS L1, GALILEO E1 and BEIDOU B1) and data link/telemetry frequencies.

- Software defined jammer.

- Programming of more than 100 different jamming profiles.

- Fully Programmable State-of-Art Digital Frequency Synthesizers.

- Control and monitoring of the System with a Laptop.

- Protection of military bases, facilities with Omni-Directional Antennas.

- 7/24 operation from the mains supply.

- Easy-to-use with user friendly interface.

- Compact system architecture.

- Built-in VSWR protection.

  - Built-in test feature.

  - High efficiency multi-band power amplifiers.

  - MIL-STD-810 compliant.
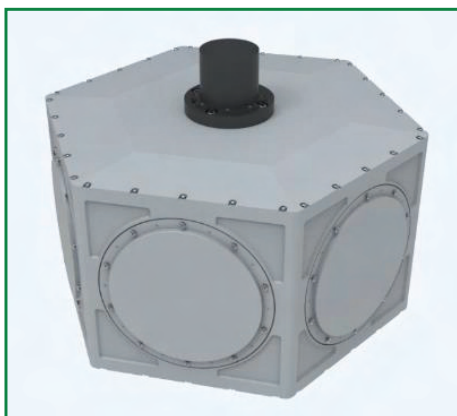
Anti-Drone System

Anti-Drone System, aims to neutralize mini and micro UAV threats in urban and rural environments. It is used for protection of critical facilities, prevention of illegal border infiltration and safety of highly populated events.

General Specs

- Detecting and tracking multiple UAVs with high accuracy using portable radar
- Low false alarm rate
- Recognizing the threats from a distance using TV/Thermal cameras
- Automatic video tracking Directional jamming capability for specific threats
- Omni directional jamming capability for swarm attacks
- Ability to switch to preloaded jamming frequency groups
- Software programmable jamming frequencies
- Requires minimum operator intervention
- Built-in-Test (BIT) capabilities
- Operating in all-weather conditions for 7/24
- Customizable with its open and modular architecture
- Compatible with military standards
- Easy to include other means of sensors (acoustic drone detection system, direction finding (DF) system) and effectors (Unmanned air vehicle (UAV) hard kill system, Laser defense system)
- Compatible to work with TAFICS infrastructure

ACAR Radar System

- Ku-band Pulsed Doppler Radar with Pulse Compression
- Track-While-Scan (TWS) mode
- Multi-target tracking, Automatic target tracking
- 360° Continuous or Sector Scanning,
- 30 rpm rotation speed
- Automatic Target Classification
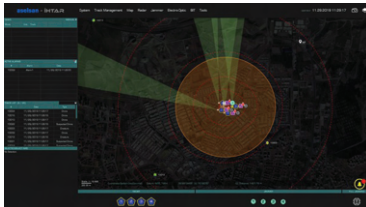- 40° instantaneous elevation coverage Adjustable Sector Width

GERGEDAN RF Countermeasure System

- Programmable RF Jammer System
- Active jamming of RFEYP trigger frequencies of radios, remote controls, mobile phones (2G, 3G, 4.5G/LTE, WI-FI) and GNSS, remote control, data/image/video transmission frequencies of Drones/Mini-Micro-UAVs in the entire radio frequency band.
- Protection against swarm threats with co-directional antenna set
- Type of antennas: with directional/co-directional antenna, antennas hidden inside the roof rack.
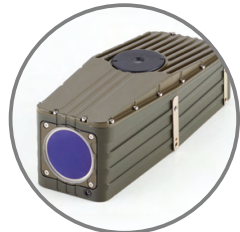
GÜNGÖR/DÖRTGÖZ Electro-Optic Systems

- The third-generation thermal imaging system DÖRTGÖZ developed for long distance surveillance and reconnaissance, can perform many tasks such as border surveillance, tactical reconnaissance, coast guard, facility security, long distance surveillance under all weather conditions day and night.
- GÜNGÖR HD is a family of high-definition daytime cameras; used for long-range surveillance and reconnaissance, fixed and mobile security applications, situational awareness, air defense applications and security units.

Command and Control System

- Centralized Command & Control capabilities with integrated GIS, alarm zones, filtering etc.
- Air picture generation
- Decision support algorithms
- Sensor fusion and auto-tracking
- Threat evaluation and effector allocation algorithms
- Centralized command & control of all sensors and effectors
- Integration of new sensors and systems with open architecture feature

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ASELSAN Border Security Systems

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Overview

ASELSAN has capability to provide Security System Solution which ensure the protection of facilities, people in the territory, citizens, pipelines, stations, borders and institutions against threats to their well-being. There can be different threats that companies, countries and governments face during providing security such as theft, intrusion,vandalism, terrorism, sabotage, smuggling and so on.

To meet the increasing challenges in the areas, ASELSAN brings its own-surveillance, acoustic intrusion detection, seismic, radar, mobilesystems to the field in order to prevent unexpected incidents and createevidence. ASELSAN creates turn-key solutions to provide security at border,critical infrastructure, pipeline and pipeline areas as well. General concepts of border security systems and solutions are defined in thisdocument.

BORDER SECURITY

Overview of the Border Security System

The aim of the systems and products is to protecting the country' border-from threats. These threats can be trespassing, smuggling, sabotage,terrorism and human traffic well. ASELSAN brings its own solution to the field so that unexpected incidents can be prevented.

Also, border areas can be mountainous, flatness, smooth or woody. ASESAN creates the tailor-made border security solution according to user needs and field condition. Those systems and products can be installed simultaneously or separately as well.

Border Security System Solution

Border Security System is another hot topic security solution, that combines advanced sensor technologies and computer-controlled infrastruture into a single System Operation Center (SOC). The system is designedfor monitoring of the border areas for target detection, intrusion, surveillance and information transmission to the SOC.

There is different type of surveillance system that ASELSAN design and manufacture. For example, there is a fixed, dome, panoramic, in-door, moving, bullet thermal and so on. ASELSAN creates wide range camera options and then determine which type of cameras should be used in the related areas according to user needs and field requirements. Moreover, ASELSAN surveillance system is being expandable structure which means, after 1000 cameras deployed to the field, it is possible to deployed 1000 more camera to the field at the next year and integrate them to the system.

On the other hand, security personal can monitor and control all of those surveillance systems at the single System Operation Center (SOC). For instance, the operator can monitor the live camera streams, replay the recorded video and also it is possible to export video streams the outside via management permission. Furthermore, camera stream can be recorded in different lengths according to user need from 1(one) month to 2(two) years.

Intruders can be detected before they approach to the borderline by smart fixed/speeddome cameras, E/O multi sensor cameras in day & night. Approaching intruders to borderline and intrusions from tunnels can be detected by MIDAS (Intrusion Detection System) which is using Distributed Acoustic Sensing Technology. MIDAS can be installed under-ground, on fence or hybrid model as well.

Figure 1: ASELSAN Surveillance Cameras (CCTV) (for reference only)

MIDAS is an intrusion detection system based on analyzing of the collected acoustic data by using the standard fiber optic cable as a sensor. It can be installed along the border line to detect intrusion. MIDAS can classify activity such as human walking, running, vehicle, excavator, digging, fence cutting, fence climbing and so on.
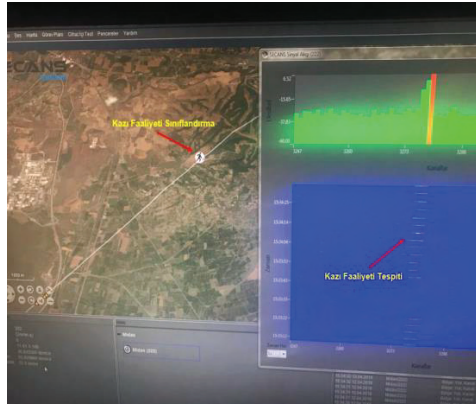
Figure 2: *:* **ASELSAN MIDAS System and System Digging Alarm (for reference only)**

When MIDAS detects intrusion or activity, closest CCTV, radar or E/O thermal camera system to the detection point can turn to the area so that security personal will be able to control intruded area. Also, all of those sensors can be controllable from System Operation Center.

Figure 3: ASELSAN Border Security Projects (for reference only)

When there is a no infrastructure along the borderline, "MUGAS Mobile Mast Mounted Surveillance System", "GUKAS Renewable Energy Powered, Portable, Surveillance and Image Transfer Systems" and "YERGOZ Seismic Detection System" can be used.

MUGAS is developed to ensure the limited period surveillance and security needs of troops through detection and tracking of potential threats independent of location and infrastructure installation. MUGAS System includes fully integrated EO/IR Sensors, ASELSAN Surveillance Systems (CCTV), 86X ASELSAN Day-Tv Camera, Ground Surveillance Radar and Gunshot Detection System as well.

Figure 4: MUGAS Mobile Mast Mounted Surveillance System (for reference only)

GUKAS surveillance system provides the necessary energy by making use of renewable solar energy. GUKAS, which is equipped with ASELSAN surveillance cameras and data links, is able to monitor large areas effectively and to transfer camera streams wirelessly. Security personals at the border areas will be able to use GUKAS power system as a power output for their telephone charge, lights, even for water boiling and so on. The system has ability to operate reliably on long term without any special equipment, logistic support or infrastructure for installation and operation.

Figure 5: ASELSAN GUKAS System (For Reference Only)

YERGOZ Seismic Detection which can be used to detect intrusion and mobility in the region with the help of its seismic sensors. The seismic sensors are warning systems that detect and classify the intrusions on the field as human and vehicle. The System is based on artificial intelligence algorithms, and transfer detections to the user via wireless communication methods.

Figure 6: YERGOZ Seismic Detection System (for reference only)

When MIDAS detects intrusion or activity, closest CCTV, radar or E/O thermal camera system to the detection point can turn to the area so that security personal will be able to control intruded area. Also, all of those sensors can be controllable from System Operation Center.

SYSTEM OPERATION CENTER (SOC)

All the systems can be controlled from the System Operation Center (SOC) via Physical Security Information Management Software (PSIM) MIRSAD. System Operation Center is composed of Security Information Management Software, servers, opeator consoles and network/IT equipment (switches, ups, cabinet, keyboards…). When a subsystem generates an alarm, system operators will be informed so that securities can be aware of ongoing activities on the field.

Physical Security Information Management (PSIM) Software MIRSAD

MIRSAD is the software used to monitor and control the sensors that designed and manufactured by ASELSAN. These sensors can be summarized as CCTV, E/O systems, MIDAS systems, seismic sensors, radar,

anti-drone system, announcement system, biometrics...) When a detection occurs by a sensor, operator is notified by MIRSAD and the location of the detection is shown on the built-in map of the MIRSAD.

Alarms and user activities are logged in the servers by MIRSAD. Then, reports can be generated for a certain time interval. The sensors are also shown as a list. If a sensor is broken it can be seen in different color in the list. So that, operator can call for maintenance. Cameras can be viewed live in different formations (2x2, 4x4 etc.). Camera records can also be viewed and exported via MIRSAD.
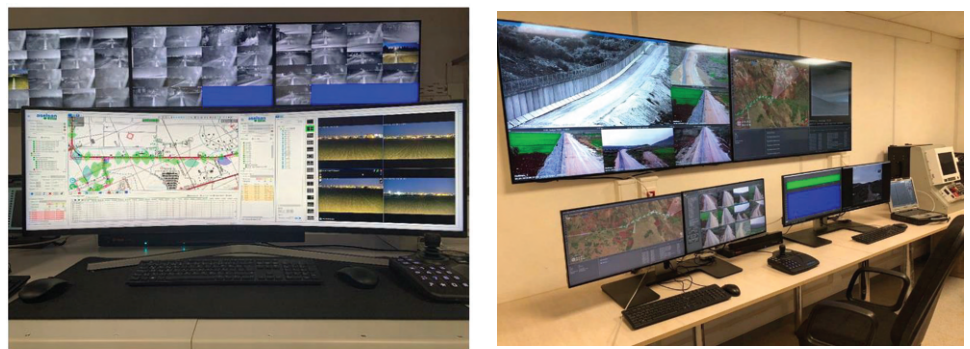
Figure 7: Sample screenshot of the MIRSAD software and SOC (for reference only)

CONCLUSION

ASELSAN carries out the security and surveillance projects in a detailed and comprehensive process utilizing analysis, design, development, production, testing, quality assurance and project management activities throughout the entire project to reach the best solution for end user. The solution is created as tailor made and installed as turn-key solution with all main and sub components.

With adaptable and scalable security system solution, ASELSAN can provide to customers cost and performance effective solutions in a short time. After a comprehensive search and analysis of the related site and field, ASELSAN's system solution can be adapted to the area based on geographical conditions, threat's properties and users' needs.
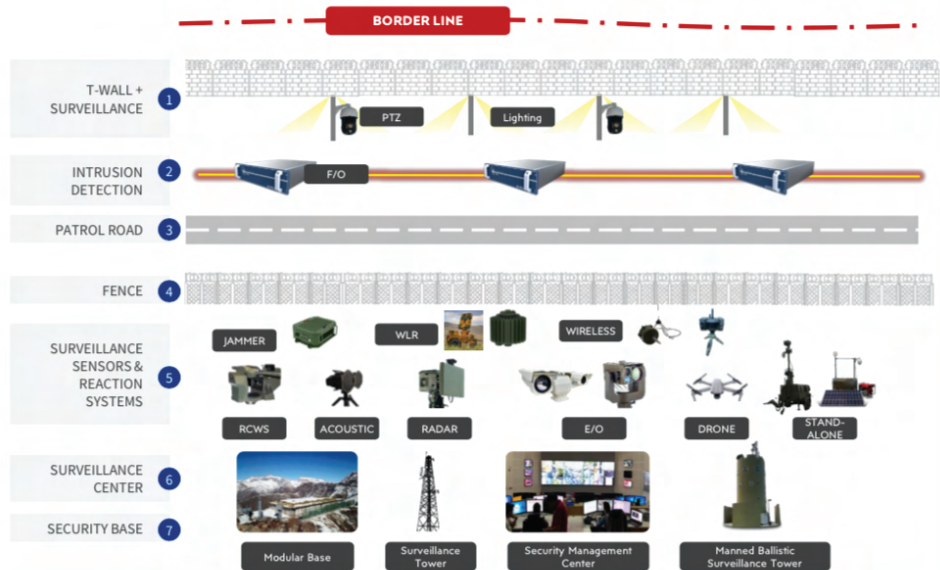
BORDER SECURITY
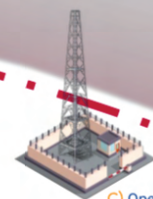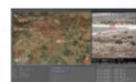
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