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IRAN
COMMUNICATIONS
INDUSTRIES

Total Solutions of C4I Intelligent Network

About IEI (Iran Electronics Industries)

Iran Electronics Industries (IEI) as the largest company in the fields of Electronic, Telecommunication, Defensive and Commercial Electro optics in the country meanwhile, industrial and technical interactions with more than 170 technological companies and establishment of 14 technological joint centers with domestic authentic universities, provides types of electronic products and services such as Radar, Electronic Warfare (EW), IT, Secure and Reliable Communication, Optics and Laser, Cyber defensive, Electronic Components, and required Space Systems for military forces and defensive industries in order to establish and increase the deterrent power and defense.

About ICI (Iran Communications Industries)

Iran communications industries (ICI) affiliated to Iran Electronics Industries (IEI) was established in 1972 with more than 35 years of credible reputation directed to manufacture diversity of communication means and participate in all international tenders with over 1000 skilled and educated personnel and lustrous background of successful experience is the main producer and designer of military/ paramilitary communication equipment and total solution in Iran and middle east.

The principal mission of ICI is researching, designing and manufacturing various types of communication systems in military/non- military fields; as well as designing and implementing total solutions such as EW, C4I, jamming networks and ECCM systems in order to establish a stable, secured and flexible communication with a suitable capacity and also developing and open architecture radio waveform technology that allows multiple radio types to communicate with each other with the goal of meeting diverse communications through the latest and state of art technology communication means & networks.

Also ICI has the capability of repairing, renewing, manufacturing and assembling different types of communication means, as well as providing after sales services and technical consulting to have a continual improvement and development.

Effective presence and implementing national projects in the fields of communication with the cooperation of IN/OUT companies and exporting various kinds of communication products, technical engineering services to foreign countries are important pace in renewing and developing our national industry.

Concentrating on time, cost and quality management, developing human resources, and staff motivation are our main purposes.

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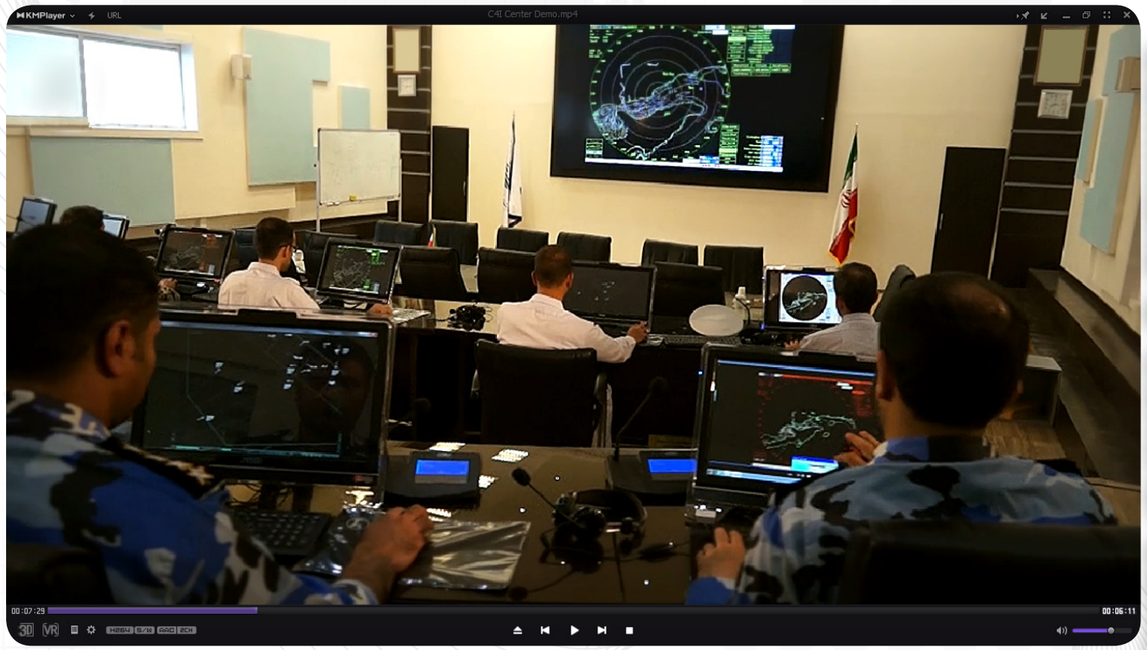
Command & Control Center

Total Solutions of C4I Intelligent Network

Sector Operation Center (SOC)



SOC is the intelligence, surveillance and reconnaissance division at the combined air operation center that provides a common threats and targeting picture that are key to planning and executing theater wide aerospace operations to meet the combined forces air component commanders' objectives.

Features of SOC System

- Producing real time air pictures by combining target track information from various distributed sensors (sensor fusion)
- Real-time monitoring of the airspace utilizing digital maps
- Distributing air pictures to the weapon systems
- Distributing air pictures to other command and control centers
- Target identification utilizing IFF systems at radars
- Various analysis tools over digital maps observing and sharing the position operational states and equipment information of system units
- Preparation of simulation scenarios for training of system operators record and replay functions
- Defining and distributing airspace control orders and battlefield geometries for the control of air space
- Compatibility with military standards
- Open system architectures compatible with modern sensors and weapon systems, and technological upgrades

System Architecture

A state-of-the-art SOC system basically comprises the following units:

- Interfaces to the sensors systems

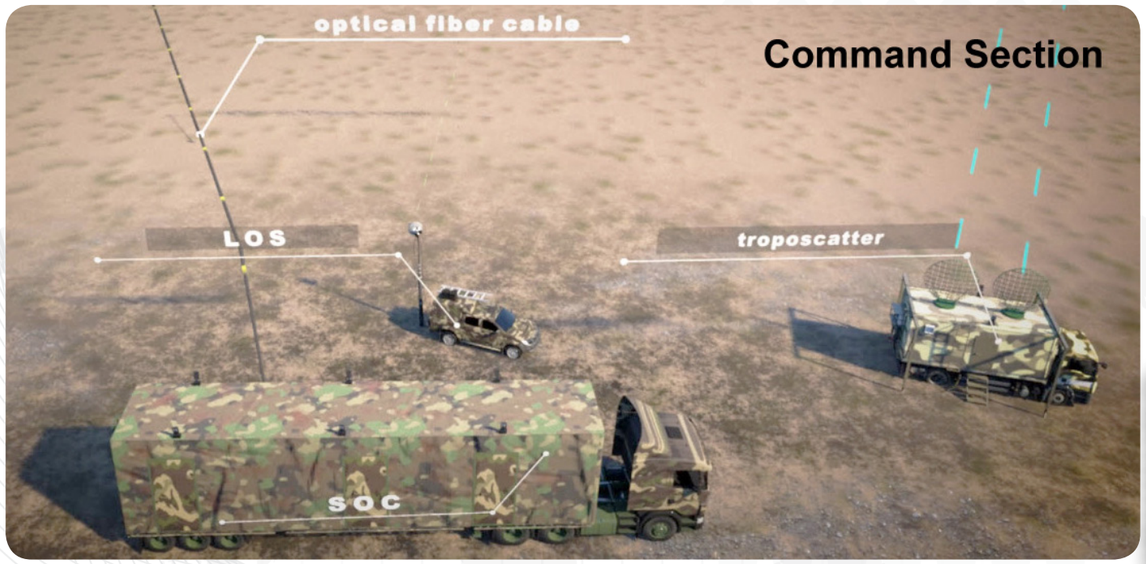
These units provide interfaces to the radars that detect and track target

- Interfaces to the weapon systems

These units provide interfaces to the weapon systems that take necessary actions against airborne threats

- Interfaces to the other command control systems

Mobile Sector Operation Center (MSOC)



Because of the vital role of SOC in the management of the intelligence, surveillance and reconnaissance division at the combined air operation center, and due to the fact that the SOC has to be active in all conditions, everywhere and every time, thus a Mobile and redundant SOC is required that can be replaced with the existing damaged SOC in a short time. For flexibility, Easy installation, rapid deployable and transportable to the command center in emergency situations, Mobile SOC (MSOC) is designed.

Features of the MSOC are similar to the SOC, in addition, flexibility, Easy installation and rapid deployable, transportable to the operation regions in military emergency situations, and operable in all climate conditions and geographical environments are other features of the MSOCs as well as providing necessary biological/operational facilities for stationary and mobile statuses.

System Architecture

A state-of-the-art MSOC system basically comprises the following units:

- Interfaces to the sensors systems
- Interfaces to the weapon systems
- Interfaces to the other command control systems
- Manufacturing according to standard/safety principles and state of the art technology

Mobile Command Center

Command & control solutions provide required methods to collect, process, and propagate the information related to staff, equipment, and military installations. This information is necessary for commanders and decision-makers to plan, organize, manage, coordinate, control, and monitor the operation in a mission. Main applications of command & control solutions are as follows:

1. Continuous collecting, processing and propagating the environmental information
2. Establishing and keeping communication between members of the command solution
3. Planning, organizing, coordinating, and managing the operation
4. Complete and continuous supporting the forces during the mission
5. Commanding, controlling, and monitoring the forces in battlefield
6. Nullifying the enemy's actions by deceiving operation, psychic operation, Electronic Warfare, and …

Considering unique role of command & control solutions in coordinating goals and activities of fighting units with environmental conditions and their fighting power, establishing secure and reliable intercommunication/external communication between parts of the command & control solutions available in different locations of the country is very important. Obviously strong and effective informational supporting the command site as main core of the command & control solutions including battlefield coordinates, audio/video reports of enemy's activities and location, and …has direct influence on the commanders' correct, accurate, and on time decision making. Therefore, operating mobile communication centers connected to the command sites via secure communication infrastructures, protects the commanders attended in the sites from the dangerous due to direct operation of the propagating communication equipment as well as providing variety of secure and reliable communications.

Capabilities

✓ Establishing secure data network using encryption algorithms through the Ethernet infrastructure
✓ Equipped with radio equipment in all frequency bands and holding conference between different bands
✓ Equipped with specific telephone network and capability of connecting telephone lines to the network
✓ Remote control capability for keeping the solution operators away from the propagating communication equipment
✓ Resisted against Electronic Warfare
✓ Equipped with surveillance and night vision system
✓ Equipped with video conference system
✓ Equipped with the modern MUXs with capability of transmitting the Ethernet, E1, and telephone lines (FXO,FXS) through the fiber optics with capacity of 155Mb
✓ Capability of establishing parallel links as alternative
✓ Capability of establishing communication with lower and upper layers via pair wire with capacity of up to 11.6Mb
✓ Capability of establishing microwave network with the other nodes in distances of up to 30km
✓ Capability of operating the local data network and supporting the WAN network as well as data transmission through different communication infrastructures (fiber optics, cable, and microwave)
✓ Connecting to/Communicating with various communication solutions in whole the country
✓ Tactical solution
✓ Resisted against chemical attacks by the technique of making positive pressure inside the shelter using the air capsules available in the solution
✓ Thermal/audio insulator on the shelter's body
✓ Capability of using thermal nets, infrared, environmental concealment, and X band

Dimension of the solution

Indoor dimension of the Communication.....Length: 4.5m, Width: 2.2m, Height: 2.2m shelter

Mobile Communication Center

This solution is considered for establishing communication and data transmission between the control and mission management centers via radio and wired infrastructures. This solution consists of the following four parts:

Central communication shelter (solution): this shelter is central core of communication and provides capability of operating and exchanging voice/data for the other parts connected to the solution.

LOS communication vehicle (solution): this part is considered for exchanging voice/data between the central communication shelter and centers of command and mission control. In this solution, LOS equipment, fiber optics, and pair wire are used as the communication infrastructures so that they support each other.

Control and operating console inside the radar shelter: using this console, attended operators inside the radar shelter can gain complete access to all the communication equipment available inside the central communication solution via the ICS and radio remote control.

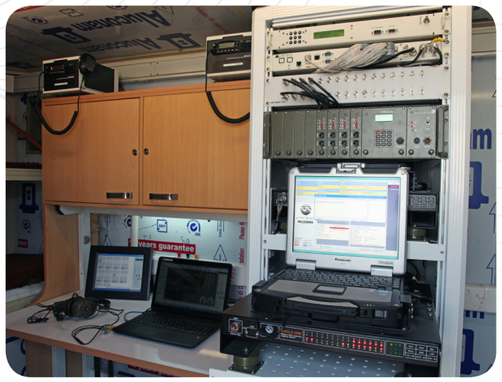
Communication/radar remote console: using this console, attended operators inside the non-propagating center independent from the radar shelter can gain complete access to all the communication equipment available inside the communication solution as well as remote control units of the radios and all information of the radar main screen.

Capabilities

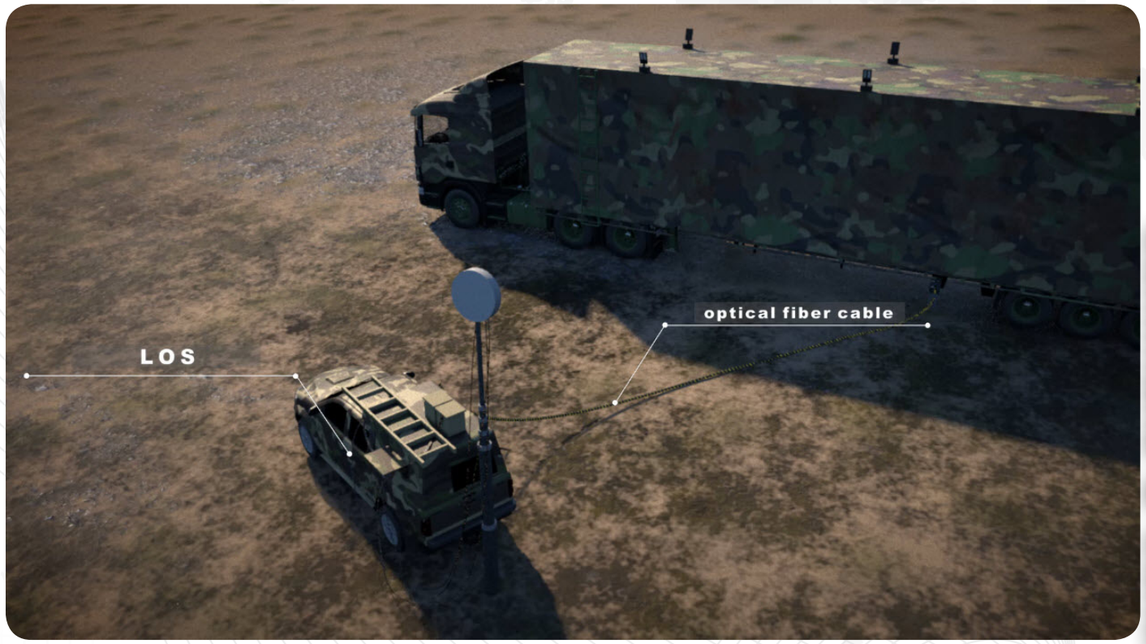
✓ Capability of establishing communication between the central communication solution, operating consoles, and LOS solution using several communication layers including the Ethernet, fiber optics, pair field wire, and LOS radio link
✓ Capability of integrating and organizing the communication equipment in a software common panel using the ICS
✓ Capability of the solution movement/maneuver tactically, carrying by a truck, and heli-board
✓ Providing safety of the operators and saving them by keeping the control units away from radio wave propagation centers
✓ Providing uninterrupted power supply needed for the communication solution (Mains power, power generator, and battery bank)

Dimension of the solution

Central communication shelter (solution).....length: 4.5m, width: 2.2m, height: 2.2m
LOS vehicle (solution).....double-cabin Canopy included TOYOTA Hilux



Tactical LOS Link



For bringing high capacity link connectivity to the battlefield, high capacity line of sight systems can be used as a solution for wireless broadband radio links. For this purpose, mobile tactical communication has been designed where it is the perfect solution for LOS radio links. This solution is a truck (same as TOYOTA Hilux) which is equipped with a canopy and different communication/electronic systems and used for transmitting/relaying various voice and data information as the E1 standard. Main responsibility of the solution is to transmit/receive various information including the E1 lines (optical/electrical), PSTN lines, Field telephone lines, data lines, and … via a 15GHz LOS radio link up to 30Km distance. In addition to maximum 16E1 capacity of the radio, it transmits the Ethernet data directly and configures it via the LAN. The radio is equipped with network management capability and supports the SNMP Ver.3. This solution can be operated in all operational areas and is a proper substitution of ground-based links in different zones.
Main part of the solution is the 15GHz radio to transmit information as the E1 via a radio infrastructure. In addition to maximum 16E1 capacity of the radio, it transmits the Ethernet data directly and configures it via the LAN. The radio is equipped with network management capability and supports the SNMP Ver.3.

General Specifications

Transportable radio relay in frequency band of 5/15GHz
60/90/120 cm antenna with adjustable horizontally/vertically from the vehicle's indoor
Type of the vehicle.....Double-cabin TOYOTA Hilux
Supply of the solution.....Remoke diesel generator
16E1 transmittable traffic.....electrical/optical, various types of voice/data, and Ethernet

Radio Specifications

Frequency band.....4.4-5/14.4-15 GHz
Power of the transmitter.....about 25dBm
Engaged bandwidth.....28MHz (16E1)
Capacity.....up to 16E1

Specifications of the MUX

Capacity.....4E1
Analogue input traffic.....FXS, FXO, Hot Line, …
Digital input traffic.....RS-232, Ethernet, …
Output traffic.....E1, optical, electrical

Mobile Command Post (MCP)

A Mobile Command Post (MCP) supports deployment forces in management and coordination of military troops for battlespace operations. The command vehicle is an indispensable instrument for authorities and organizations for controlling and mastering difficult operational situations in a manageable and organized fashion.
Some goals of the MCPs are quick movement, transmitting/receiving various information, equipping with various HF/VHF/UHF radios.

Command & Control Center

Services

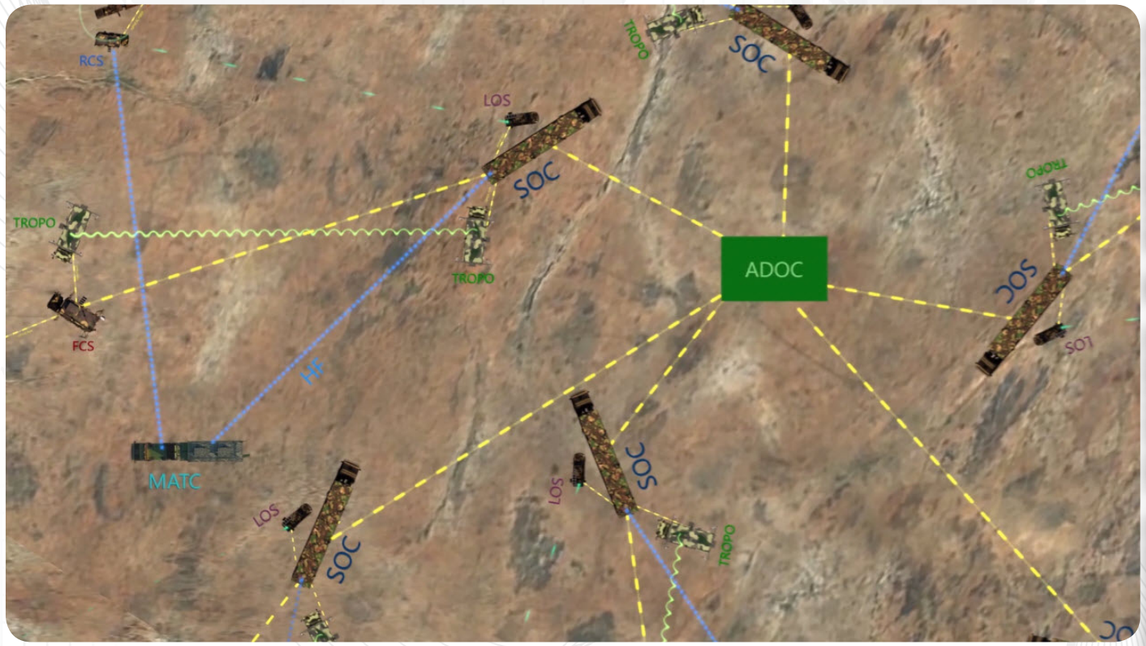
- HF/VHF/UHF communication
- Cellular and satellite, secure and non-secure telephone
- Cellular and satellite data connectivity
- Video teleconferencing
- Video capture and security imaging
- Weather station
- 40 foot Winch mast
- 10 KVA generator

Features

- Best networking with headquarters
- Mobility on and off-road
- Compact and robust for exploratory operations

Command & Control Center

Air Defense Operation Center (ADOC)



The SKY-OBSERVER (ADOC) will have the latest command and control and information assurance capability in partnership with the air force to enhance regional sectors. ADOC is expected to achieve initial operation capability before the delivery of first fire unit to the country.

Features of the SKY-OBSERVER System

- Producing real time air pictures by combining target track information from various distributed sensors (sensor fusion)
- Real-time monitoring of the airspace utilizing digital maps
- Distributing air pictures to the weapon systems
- Distributing air pictures to other command and control centers
- Target identification utilizing IFF systems at radars
- Various analysis tools over digital maps observing and sharing the position operational states and equipment information of system units
- Preparation of simulation scenarios for training of system operators record and replay functions
- Defining and distributing airspace control orders and battlefield geometries for the control of air space
- Compatibility with military standards
- Open system architectures compatible with modern sensors and weapon systems, and technological upgrades

System Architecture

A state-of-the-art SKY-OBSERVER system basically comprises the following units:

- Air Defense Operation Center (ADOC)

ADOCs at different hierarchical levels (Army, Corps, Brigade, etc.) performed all the necessary command, control and information system functionality

- Interfaces to the sensors systems

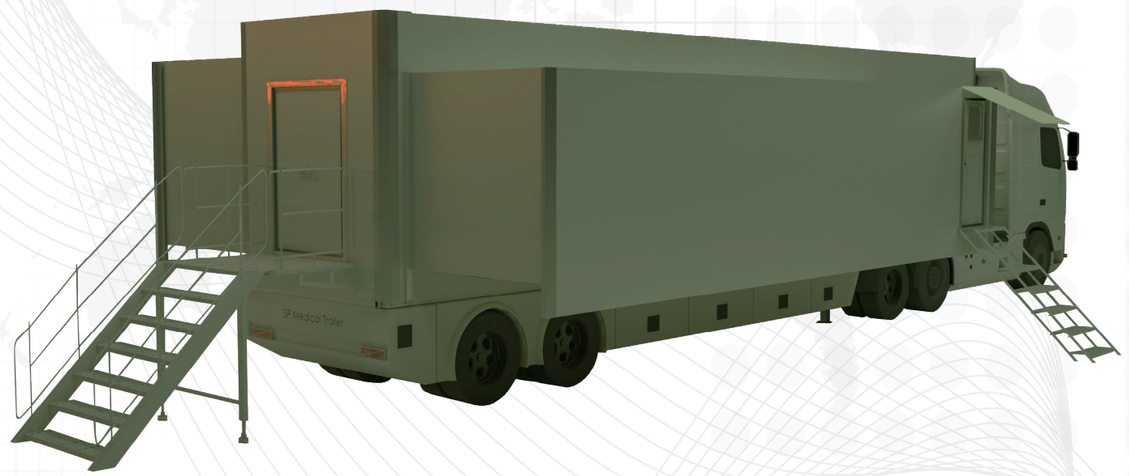
These units provide interfaces to the radars that detect and track target

- Interfaces to the weapon systems

These units provide interfaces to the weapon systems that take necessary actions against airborne threats

- Interfaces to the other command control systems

Mobile Air Defense Operation Center (MADOC)



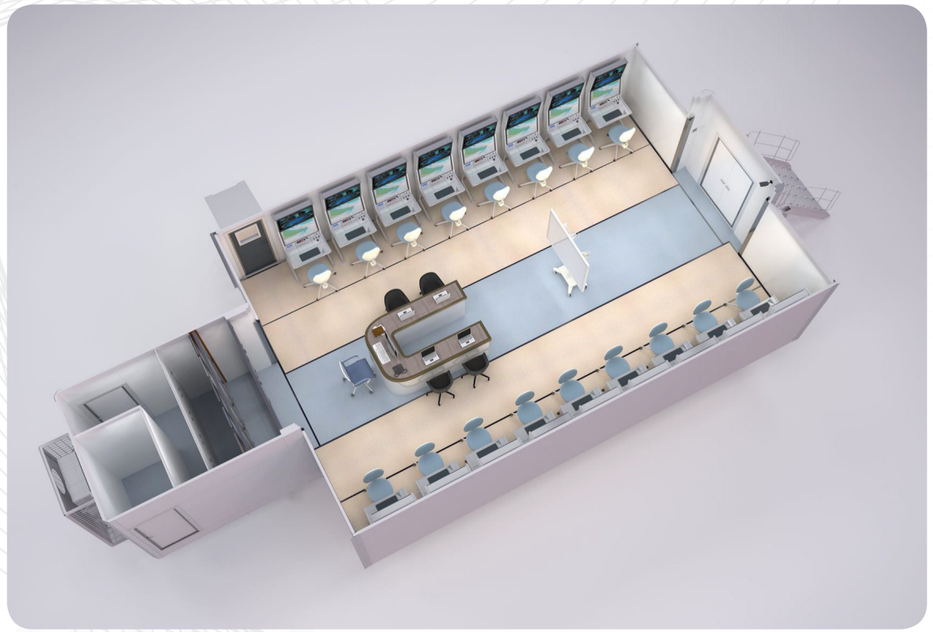
Because of the vital role of ADOC in the management of SOC and MSOC and due to the fact that the ADOC has to be active in all conditions, everywhere and every time, thus a Mobile and redundant ADOC is required that can be replaced with the existing damaged ADOC in a short time. For flexibility, Easy installation, rapid deployable and transportable to the command center in emergency situations, Mobile ADOC is designed.

Features of the MADOC are similar to the ADOC, in addition, flexibility, Easy installation and rapid deployable, transportable to the battlespace in emergency situations, and operable in all climate conditions and geographical environments are other features of the MSOCs as well as providing necessary biological/operational facilities for stationary and mobile statuses.

System Architecture

A state-of-the-art mobile SKY-OBSERVER system basically comprises the following units:

- Mobile Air Defense Operation Center (MADOC)
- Interfaces to the sensors systems
- Interfaces to the weapon systems
- Interfaces to the other command control systems



Portable Sector Operation Center (PSOC)

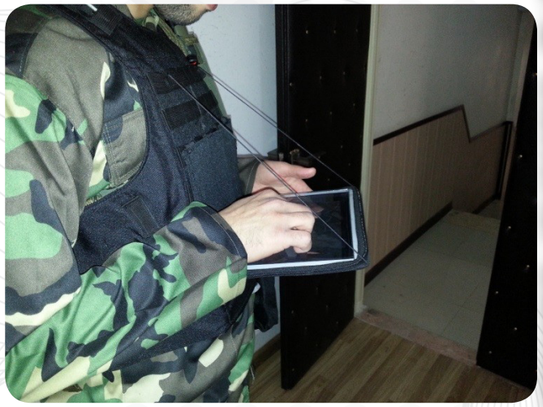
SOC is the intelligence, surveillance and reconnaissance division at the combined air operation center that provides a common threats and targeting picture that are key to planning and executing theater wide aerospace operations to meet the combined forces air component commanders' objectives.

Because of the vital role of SOC in the management of all military troops and due to the fact that the SOC has to be active in all conditions, everywhere and every time, thus a redundant SOC is required that can be replaced with the existing damaged SOC in a short time. For flexibility, Easy installation, rapid deployable and transportable to the command center in emergency situations, Portable SOC is designed. In fact PSOC is the core of SOC where packed in a few boxes to move easily to the pre-installed infrastructure operation center. The number of operators of the PSOC can be extended by the available core-connected infrastructures.

Features

- Flexible
- Easy installation and rapid deployable
- Transportable by light vehicles

Battlefield Management System (BMS)



The Battle Management System (BMS) is tactical command and control system that lets you utilize the full potential of your forces by increasing the level of awareness in all units at all times.

Key features

- Built as one coherent system makes it scalable to your specific needs
- Based on an open integration platform enabling easy adaptation to change
- Navigation and route management
- Force tracking
- Reports
- Alarms & Alerts

Integrator

The information collected by troops and trough sensors will be your eyes and ears on the battlefield providing you with a clear overview of the present situations and helping you predict what lies ahead you can control the course of action and choose when and where to engage.

Added key functionalities

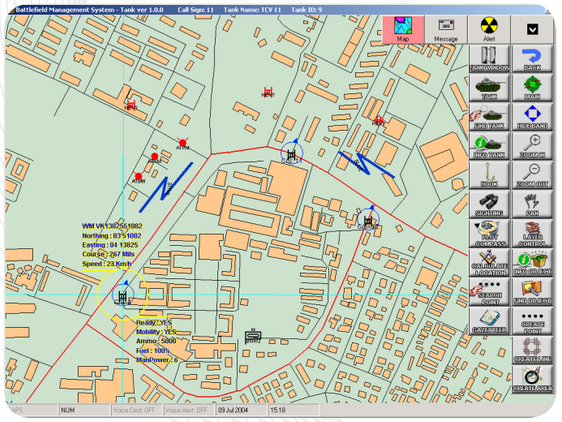
- Integration of vehicle information system
- Integration of sensors
- Integration of video systems
- Remote sensor management
- Multi role functionality
- Collaborative mission management

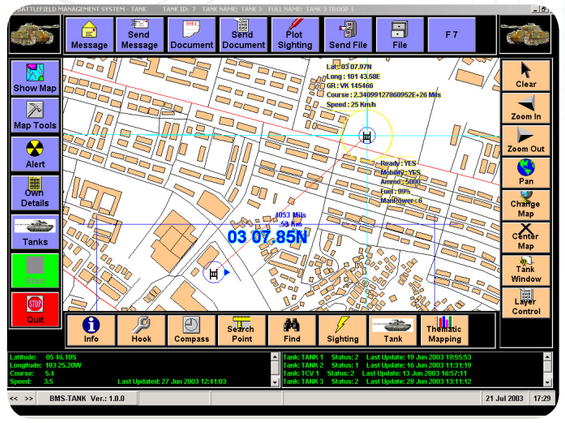
Net commander

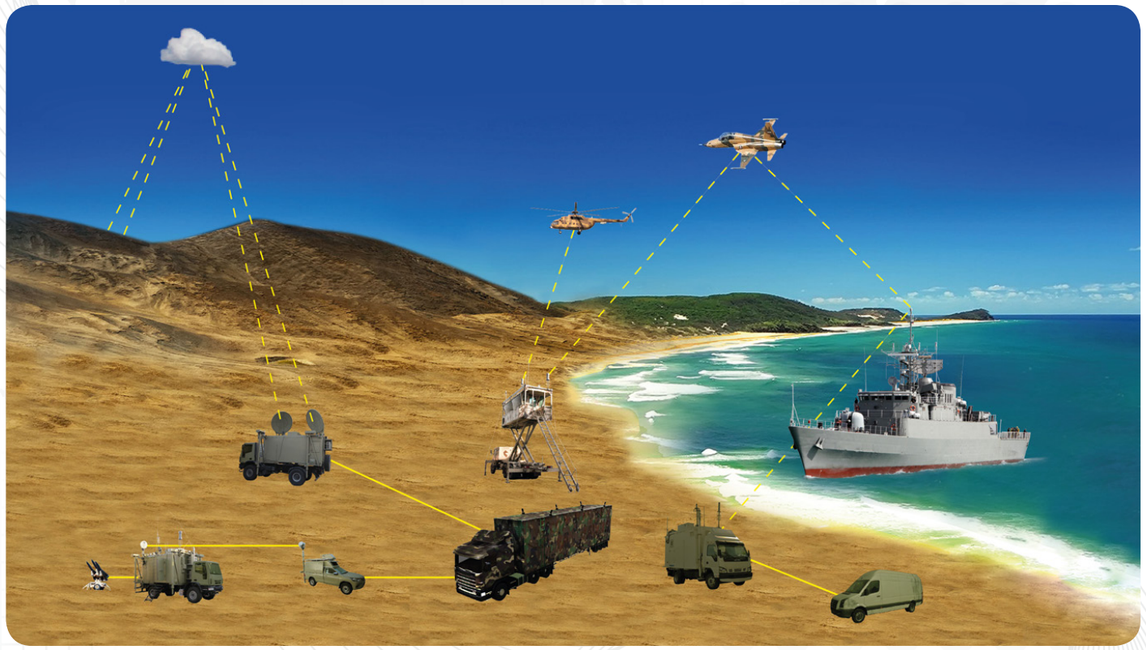
The net commander is an extensive and complete configuration to support headquarters needs. It incorporates the most up-to-date technologies and is compliant with the latest military database and interoperability standards. The flexible multilevel system provides combined arms warfare capability.

Added key functionalities

- Interoperability
- Mission management
- Network management
- Enhance common operational picture
- Decision support
- Planning support
- Logistic support
- Evaluation support







Integrated Communication Solution

Tactical Integrated Communication Vehicles (Light Weight)

Light tactical communication solutions are the go-to vehicles, and performance is paramount. Generally, light tactical communication solutions are established inside shielded Canopy (metallic/composite) over light vehicles such as various type of single-cabin/double-cabin pickup, van, or SUV. Some goals of these solutions are quick movement, transmitting/receiving various high capacity information, equipping with various HF/VHF/UHF radios ... using various types of communication/electronic systems (equipped inside the canopy). These solutions have the capability of connecting to fiber optics and the country communication lines. They have been designed and manufactured with the goal of establishing tactical communication through several layers with capability of establishing high capacity data communication quickly, keeping the operational centers away from communication propagation, ECCM, and resisting against eavesdropping, hacking, penetration, deceit, disorder, and EMP operation.

In order to provide reliable and secure communication/infrastructure services as well as establishing communication with other solutions and centers, light/semi-heavy solutions use various communication infrastructures such as radio/satellite infrastructures and non-propagating infrastructures e.g. fiber optics and Ethernet. Therefore, in case that a communication layer is unavailable, other layers can be used. Furthermore, capabilities of troubleshooting and setting up the infrastructural networks (such as fiber optic splicing, monitoring status of the fiber optic transmission lines, and …) tactically are considered in the solutions. Light communication solutions can be connected to semi-heavy communication solutions, command centers, and data transmission centers remotely to be responsible for providing data/voice transmission path.

High speed, flexibility, transportable to high/impassable areas and operable in all climate conditions and geographical/operational environments are other features of the solutions as well as providing necessary biological/operational facilities for stationary and mobile statuses. Whereas Canopy cabins are used in bad/improper locations and climate conditions, they are manufactured according to standard/safety principles and state of the art.

Tactical LOS Communication Solution

For bringing high capacity link connectivity to the battlefield, high capacity line of sight systems can be used as a solution for wireless broadband radio links. For this purpose, mobile tactical communication has been designed where it is the perfect solution for LOS radio links. This solution is a truck (same as TOYOTA Hilux) which is equipped with a canopy and different communication/electronic systems and used for transmitting/relaying various voice and data information as the E1 standard. Main responsibility of the solution is to transmit/receive various information including the E1 lines (optical/electrical), PSTN lines, Field telephone lines, data lines, and … via a 15GHz LOS radio link up to 30Km distance. In addition to maximum 16E1 capacity of the radio, it transmits the Ethernet data directly and configures it via the LAN. The radio is equipped with network management capability and supports the SNMP Ver.3. This solution can be operated in all operational areas and is a proper substitution of ground-based links in different zones.

Main part of the solution is the 15GHz radio to transmit information as the E1 via a radio infrastructure. In addition to maximum 16E1 capacity of the radio, it transmits the Ethernet data directly and configures it via the LAN. The radio is equipped with network management capability and supports the SNMP Ver.3.

General Specifications

Transportable radio relay in frequency band of 5/15GHz
60/90/120 cm antenna with adjustable horizontally/vertically from the vehicle's indoor
Type of the vehicle.....Double-cabin TOYOTA Hilux
Supply of the solution.....Remoke diesel generator
16E1 transmittable traffic.....electrical/optical, various types of voice/data, and Ethernet

Radio Specifications

Frequency band.....4.4-5/14.4-15 GHz
Power of the transmitter.....about 25dBm
Engaged bandwidth.....28MHz (16E1)
Capacity.....up to 16E1

Specifications of the MUX

Capacity.....4E1
Analogue input traffic.....FXS, FXO, Hot Line, …
Digital input traffic.....RS-232, Ethernet, …
Output traffic.....E1, optical, electrical

Multi-layer Radio Communication Solution

In order to establish communication between the centers and keep the operators away from radio wave propagation, this solution has been designed and manufactured. In this solution, wireless/ wired equipment has been considered inside the vehicle proportionate to the mission goals. The solution is equipped with the ICS for integrating and managing the communication equipment.

Technical Capabilities

✓ Radio communication layers: various HF/VHF/UHF radios
✓ Cable communication layers: Ethernet, pair field wire, fiber optics
✓ Including tactical connection lid for gaining access to the solution externally
✓ Equipped with the ICS for integrating and organizing the communication equipment
✓ Capability of transporting the solution and its maneuver tactically
✓ Saving the operators from dangerous radio propagation center by controlling the systems remotely
✓ Equipped with power generator as emergency power supply and UPS as a vital power supply
✓ Equipped with tactical earthing system of mobile solutions
✓ Equipped with air condition (cooling/heating)/fire alarm system

Integrated Communication Solutions

Tactical Remote Communication Solution

This solution has been designed and manufactured for remote operation of various communication equipment via fiber optic/pair field wire infrastructure. According to the missions, input port of the solution can be connected to various military/non-military radios in different frequency bands, switchboards, and equipment of data transmitting/receiving. All the communication equipment connected to the solution is integrated by the ICS so that operator of the solution can operate the communication equipment remotely using remote consoles as two military laptops via fiber optic/pair field wire infrastructure.

Capabilities

- ✓ Capability of controlling various radios and modems remotely
- ✓ Capability of establishing video communication in the field for operational commanders
- ✓ Capability of establishing voice communication and data transmitting/receiving between different units via non-propagating cable/fiber optic infrastructure
- ✓ Capability of connecting to various radios in HF/VHF/UHF bands remotely

Dimension of the Solution

Indoor dimension.....length: 3m, width: 1.9m, height: 1.8m
Vehicle type.....VAN

Mobile Integrated Communication Centers (Semi-Heavy)

Generally semi-heavy tactical communication solutions are designed shielded inside a shelter. Shelter's rooms can be manufactured fixed, installed over a foundation, over a truck or mini-truck (maximum 8 tons), over a transportable wheel included Remoke system, and over a trailer. Because available equipment inside the shelters should be protected against strong electromagnetic interferences, usually shielded shelters are used in military solutions for protecting the equipment as well as establishing fixed/mobile communication systems. All propagating equipment are installed inside these shelters and connected to other solutions via fiber optic/pair wire. Generally these solutions are responsible for establishing various types of radio communication in different frequency bands as well as indoor/outdoor switching. In addition to responsibilities of light communication vehicles, semi-heavy communication solutions (semi-heavy shelters) can integrate and transmit the data with high capacity via the fiber optic infrastructure and transmit it by the LOS radios. Even capability of designing mobile control & command room of communication/infrastructure equipment is considered in the shelters.
These solutions can be transported to high areas and all desired zones to operate in every climate condition and geographical/operational area. In addition, they can be equipped with necessary biological/operational facilities in fixed/mobile status.
Other features of the solutions are as follows:

- ✓ High movability and transporting in impassable zones
- ✓ Providing supply by different sources such as power generator, UPS, and or Mains power
- ✓ Capability of operating specific tactical fiber optic high capacity microwave networks and country communications
- ✓ Benefitting from secure communication using the EW communication equipment, network encryption units, and telephone lines
- ✓ Benefitting from all analogue/digital wireless equipment in the HF/VHF/UHF band
- ✓ Integrating wireless communication and propagating systems as well as transmitting it by the ICS available inside the solution
- ✓ Capability of announcement, warning alarm, and fire alarm
- ✓ Surveillance system equipped with night vision equipment
- ✓ Equipped with video conference system

Communication Shelter

This solution is designed and manufactured for establishing radio communication and transmitting digital information with capability of transporting and establishing tactical communication sites quickly. By networking these solutions, commanders can respond to enemy timely in commanding process.
With the goal of establishing secure and reliable communication quickly in different layers, communication systems are integrated/organized. In addition, other accessories are configured and located in specified locations.

Capabilities

- ✓ Including the HF radio equipped with the ECCM
- ✓ Including the VHF-L radio equipped with the ECCM
- ✓ Including the VHF DMR radios
- ✓ Equipped with light arresters and RF cables
- ✓ Including the data transmission system via the fiber optic infrastructure
- ✓ Including the data transmission system via the pair wire infrastructure
- ✓ Establishing communication with various marine vessels
- ✓ Establishing communication with helicopters of naval forces

Dimension of the solution

Dimension of the solution cabin.....length: 6m, width: 2.4m, height: 2.2m
Weight of the cabin.....7 tons
Material of the cabin.....aluminum

Multilayer Communication Solution

Providing communication infrastructures in various layers and war condition for establishing secure and reliable communication with commanding/operational fixed/mobile units of naval forces, coast surveillance units, civil communication centers, and … is important. Therefore, considering need of establishing reliable communication in abovementioned conditions, TCS-442 multilayer communication solution has been designed and manufactured. Whereas this solution is equipped with various communication equipment, operating the solution for establishing regional/trans-regional communication cause increasing quality, security, and … for establishing communication infrastructures between military units.

Capabilities

- ✓ Capability of establishing communication in the HF/VHF/UHF bands
- ✓ Capability of establishing communication via pair wire, fiber optics, and Ethernet
- ✓ Equipped with the tactical voice ICS
- ✓ Equipped with power generator for providing emergency power supply

Dimension of the solution

Indoor dimension of the communication.....length: 4.5m, width: 2.2m, height: 2.2m shelter

Integrated Communication Solutions

Mobile Multilayer Communication Solution

One important and vital measure of armed forces in classic and asymmetric wars is to support and manage the EW solutions for jamming the enemy's communication network. Therefore establishing secure/reliable tactical communication networks protected against the enemy's Electronic Warfare is very essential to direct and control the EW tactical mobile solution networks. One of the communication systems used for establishing secure and reliable communication in the enemy's EW condition is the Direct-Sequence Spread Spectrum (DSSS) radios. MCS-960 Multilayer Communication System has been designed and manufactured as central core of establishing, directing, and controlling the EW mobile tactical solution networks for establishing secure/reliable/quick the solutions through the E1/Ethernet infrastructure via fiber optics and field wire with capability of supporting multilayer communication including microwave radio link, HF/VHF LB (FM, AM, …)/UHF radios, and DSSS radios.

Capabilities

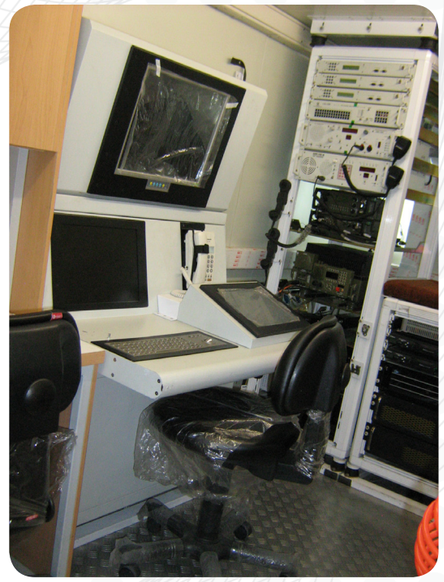
✓ Distributing analogue/digital internal telephone lines and allocating the PSTN lines for telephone communication of available units in filed hospital camp
✓ Equipped with various types of data transmission equipment in the E1/Ethernet infrastructure including fiber optics equipment, LOS microwave radio link, and DSSS radio for operating in jamming condition
✓ Equipped with various HF/VHF/UHF radios with the ECCM, Hopping, and DS technique for operating in jamming condition
✓ Equipped with various data/voice encryption systems in the network infrastructure
✓ Tactical Data Forward capability and Local Hub performance for transmitting/receiving the data in through the E1/Ethernet infrastructure
✓ Equipped with switchboard with capability of connecting the 6E1 PRI for establishing voice communication via the PSTN, internal, and magnetic telephone lines with fighting units
✓ Equipped with diesel generator as the Remoke
✓ Equipped with the fiber optics reel with the length of 1Km and type of tactical armored plated for establishing communication between fighting units in war field
✓ Capability of carrying by helicopter (heli-board)

Dimension of the Solution

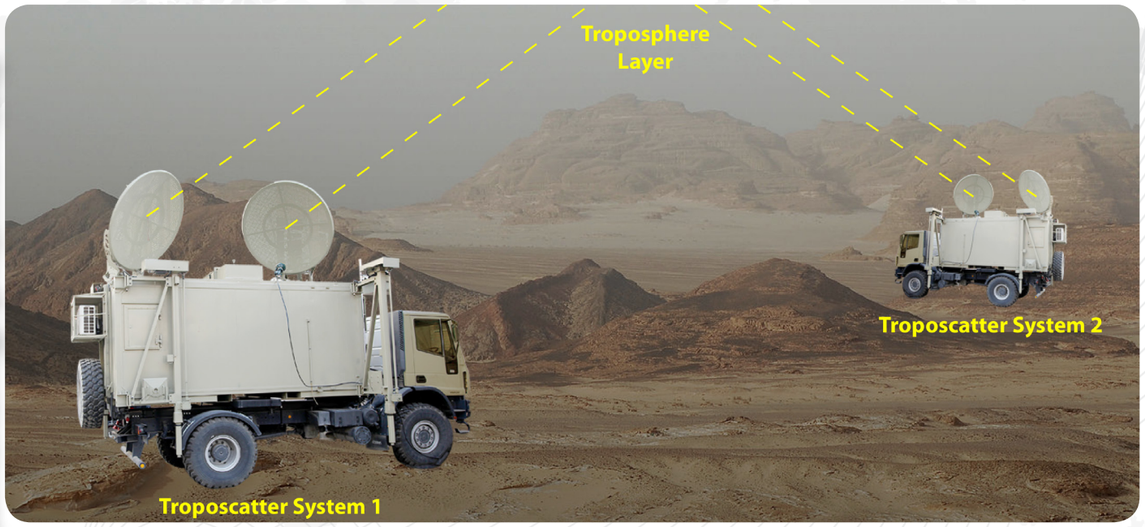
Indoor dimension of the communication.....length: 4.5m, width: 2.1m, height: 2.2m shelter

Trailer

Truck with Off Road capability proper for moving through rugged paths



Troposcatter Communication Solution



Troposcatter solution is a Full Duplex communication solution with capability of establishing the NLOS/long distance communication using reflection property of the troposphere/scattering layer in frequency band of 4-5 GHz for establishing reliable/secure voice communication including various Hot Line, FXS, FXO, pair wire, 4-wire, and … telephone lines and data communication. This solution is considered for transmitting information of the radar sensors, voice messages, and data of the radar sites from operational zones to command & control centers via the troposphere layer through over the horizon paths where LOS communication cannot be established with more than 150Km communication distance. In this solution, in order to establish various communication of the command network most of the needed communication ports including fiber optics, Ethernet, LAN, E1, and … parts are available. Forecasted capacity for communication link is 2Mbps. In case of decreasing the capacity to 512Mbps, 1Mbps, and 256Kbps, sensitivity and communication distance can be increased. All information including voice conversation, radar data, and or exchanged videos is encrypted by complicated encryption systems so that it cannot be eavesdropped and deciphered by the enemy. In order to increase communication distance, in addition to point-to-point application of the mentioned link, it can be operated as a repeater.

Capabilities

- ✓ Operable as Troporscatter/diffraction/LOS solution
- ✓ Capability of frequency/distance diversity for coping with fading of the troposcatter channel
- ✓ Capability of networking via the Ethernet, E1, and fiber optics
- ✓ Equipped with the link budgeting software for the troposcatter/diffraction channels
- ✓ Equipped with the GUI software
- ✓ Including the OW channel for establishing voice communication and data transmission channel for controlling the link
- ✓ Capability of controlling the data bandwidth from 256k to 1E1
- ✓ Capability of frequency changing up to 180MHz in transmitter/receiver
- ✓ Capability of setting up the solution only with one antenna and dual diversity
- ✓ High security index against Electronic Warfare and eavesdropping of the enemy
- ✓ Capability of carrying by helicopter (heli-board)

Dimension of the solution

Indoor dimension of the communication.....length: 4.5m, width: 2.2m, height: 1.8m shelter

Trailer

15-Ton Truck with Off Road capability proper for moving through rugged paths

Crisis Management Communication System

Providing communication infrastructures in various layers and critical conditions due to unexpected events such as flood, earthquake, fire, ... is very important in a wide geographical zone between command/operational sites of rescue and assistance. Therefore, MCS-910/E has been designed and manufactured considering necessity of establishing reliable communication in the abovementioned conditions. Whereas the system is equipped with various types of communication equipment in different layers and due to capability of moving and establishing it in impassable areas, rescue and assistance process can be accomplished quickly, carefully, securely, … by operating this system.

General Capabilities

✓ Distributing internal analogue/digital telephone lines and allocating the PSTN lines for establishing telephone communication of available units inside the command site
✓ Benefitting from private telephone line via the mobile phone converter system for making telephone calls and sending/receiving facsimile
✓ Establishing Ethernet network for available units inside the command site
✓ Establishing communication link between the command sites of rescue and assistance via the microwave/satellite radio links
✓ Surveillance/video recording service
✓ Benefitting from announcement/alarm system in command site
✓ Establishing radio communication in long distances using the HF radio and wideband antenna
✓ Equipping the mobile rescue and assistance units with vehicular radios for establishing reliable communication and increasing communication distance by powerful repeater
✓ Carrying with helicopter (heliboard)

Dimension of the System

Indoor dimension.....Length: 5.9m, width: 2.2m, height: 2.2m

Total Solutions of C4I Intelligent Network

Communication Center for Field Hospitals and Emergency Camps

Integrated Communication Solutions

Providing internal secure/reliable communication infrastructures between the units available in the field hospitals and establishing long distance communication with relative units and central site are vital for supporting treatment process of wounded and patients benefiting from Tele Medicine for consulting the sub-specialists doctors in critical conditions such as natural disasters, war, and ... In addition assisting deprived/remote/impassable areas using these communication solutions is possible. This solution is equipped with various types of communication equipment in different layers as well as a bed set and ICU equipment along with video conference system for medical examination and Tele Medicine. The solution includes a shelter set equipped with communication room, treatment room, and maintenance room of the equipment and communication infrastructures along with necessary equipment and extension container for carrying the accessories and power generator.

Capabilities

✓ Distributing analogue/digital internal telephone lines and allocating the PSTN lines for telephone communication of available units in filed hospital camp
✓ Benefitting from specific telephone line via the mobile phone converter system for making telephone calls and sending/receiving the facsimile
✓ Establishing Ethernet for available units in the field hospital camp
✓ Establishing communication with external networks via the microwave radio link
✓ Surveillance service and video recording
✓ Benefitting from announcement/alarm system inside the field hospital camp
✓ Establishing long distance radio communication using the HF radio and wideband antenna
✓ Equipping the mobile hospital units (ambulance) with the UHF DMR vehicular radios for establishing secure/reliable communication and increasing communication distance using a powerful repeater
✓ Capability of carrying by helicopter (heli-board)

Dimension of the solution

Indoor dimension of the communication.....length: 5.9m, width: 2.2m, height: 2.2m shelter
Indoor dimension of the extension container....length: 2m, width: 2.2m, height: 1.8m
Length of the trailer’s flatbed.....9m

Integrated Communication Solutions

Moveable Integrated Communication Centers (Heavy)

Generally heavy tactical communication solutions are manufactured as shielded shelter. Shelter's rooms can be manufactured fixed, installed over a foundation, over a truck (13m), over a transportable wheel included Remoke system, and over a trailer. Because of operational importance, available communication equipment inside the shelter should be protected completely against various electromagnetic interferences. In addition electronic circuits used inside the shelters should be strengthen against shock. In these solutions, information and data are received from different sources, various radars and sensors, data banks, surveillance cameras, and … and then they are processed by considered servers inside the shelter. After combining and using advanced algorithms, they are transmitted to command & control of the field and or operation. All information entering and exiting the different divisions of command & control for controlling the field are accomplished via the servers, data switches, MUX, fiber optic terminals, switchboard, advance voice recorder system, facsimile, encryption system, encryption system of lines and network, and … Using these solutions, time duration between receiving the massage and commanding in the field is decreased significantly. This solution has been equipped with welfare facilities for the operators.
Some features of the solution are as follows:

- ✓ High movability and transporting through impassable areas
- ✓ Providing power supply via different sources such as power generator, UPS, and or Mains power supply
- ✓ Capability of benefitting from specific microwave high capacity networks, tactical fiber optics, and country communication lines
- ✓ Benefitting from secure communication using the ECCM communication equipment, and encryption systems of network/telephone lines
- ✓ Benefitting from all analogue/digital wireless equipment in the HF/VHF/UHF bands
- ✓ Integrating wireless communications and propagating systems and transmitting them by the ICS available inside the solution
- ✓ Capability of announcement, warning alarm, and fire alarm
- ✓ Surveillance system equipped night vision equipment
- ✓ Equipped with video conference system

Mobile Command & Control Center

Command & control solution has been designed and manufactured for unity of commanding proportionate to operational goals for launching the mission and transmitting the data. This solution includes two propagating and non-propagating parts so that the propagating part has been designed as a Remoke to be kept away from the non-propagating solution and their connection is made via fiber optics and or pair wire. After establishing the non-propagating solution, it is capable to be extended along its sides. In this case, more space is provided for the operators.

Capabilities

- ✓ Equipped with monitoring console for receiving radar data of sire defense network
- ✓ Equipped with monitoring console of the UAV information for controlling and monitoring the UAVs
- ✓ Equipped with aerology system and the AFTN
- ✓ Equipped with video conference system
- ✓ Equipped with various radio communication layers
- ✓ Equipped with the LOS radio in the frequency of 15GHz
- ✓ Equipped with pair wire, fiber optics, and Ethernet communication layers
- ✓ Equipped with the ICS
- ✓ Equipped with the LOS radio in frequency band of 4.4-5 GHz with the 1+1 structure and 16E1 transmission capacity
- ✓ Equipped with the E1 encryption system
- ✓ Equipped with voice recorder system
- ✓ Equipped with switchboard
- ✓ Equipped with converter of the mobile phone GSM to the PSTN
- ✓ Capability of extending along sides for increasing indoor space
- ✓ Equipped with solar system as a supply source
- ✓ Equipped with power generator for providing emergency power supply
- ✓ Equipped with power dispatching system and the UPS

Disaster Communication Center

Quick transportation and establishment of communication equipment and providing secure/reliable communication infrastructures in location of the events between available units in the locations and crisis management center and establishing long distance communication with related units for supporting the process of management and assistance benefitting from new different communication infrastructures in crisis conditions such as flood, earthquake, fire, and … are vital where crisis management team should be attended. In addition establishing communication infrastructures in deprived/remote/impassable areas for the other available teams in the zones such as emergency, fire fighter, and … is possible benefitting from this communication solution. This solution is equipped with various types of communication equipment in different communication layers. The solution includes a shelter set equipped with meeting/operating room, communication mast room, room of the needed communication equipment and infrastructures, room of power generator, and special boxes for carrying the accessories.

Capabilities

✓ Equipped with local switchboard based on the VOIP for distributing the PSTN lines and GSM of mobile phone lines for operators and other personnel attended in the event location
✓ Including wireless VOIP telephone set for using through 200m radius of the solution location
✓ Establishing WIFI network in the solution location
✓ Establishing Ethernet for the units available in the event location
✓ Making connection with external networks via fiber optic link and pair wire
✓ Satellite communication infrastructure for establishing data communication infrastructure in different zones
✓ TD-LTE Internet communication infrastructure for establishing data communication
✓ Surveillance service and video recording
✓ Establishing radio communication using the VHF-HB radio
✓ Increasing communication distance and operational radius of the handheld radios using powerful repeater
✓ Quadcopter system with capability of aerial filming of the event location

Dimension of the solution

Outdoor dimension of the shelter.....length: 7.3m, width: 2.5m, height: 2.2m
Indoor dimension of the shelter.....length: 7.2m, width: 2.4m, height: 2.1m

Monitoring & Management Center

The system tasks are acquiring data, Monitoring information and situation and command.
This vehicle (including three sections as the surveillance and control, servers and communication equipment, command and control sections) has been designed for meeting communication reliability needs of organizations in emergency and crisis conditions such as earthquake and fire so that immediate access to information, integrating and processing it, and quick decision making is possible by the system from commander level to operator level.
Also the system includes multi-user video communication, data transmission, as well as voice/video/data transmission.

Surveillance and control cabin

- 8 operator consoles with 3 monitors
- 1 sight surveillance console
- Telephone communication network (switching or VoIP)
- Video conference system
- ICS console for each operator
- Welfare facilities

Network Communication Layers

- Various communication layers of the vehicle are: satellite terminal, HF/VHF radio communication, microwave, Wi-Fi and GSM links, and fiber optic

Capacity of communication layers

✓ Using advanced MUXs with capability of transferring the Ethernet, E1, and telephone lines (Fxo and Fxs) via fiber optic with capacity of 155Mb
✓ Capability of establishing parallel fiber links as Alternative
✓ Capability of establishing communication with upper and lower layers via pair wire up to 6.11Mb capacity
✓ Capability of establishing microwave network with the other nodes within 30km distance with 34Mb capacity

Cabin of Servers and Communication Equipment

- Processing servers and storages
- Voice recording system
- Switchboard
- Various data transmission infrastructures (fiber optic and G.SHDSL)
- Network switches and routers
- Welfare facilities

Command and control cabin (VIP)

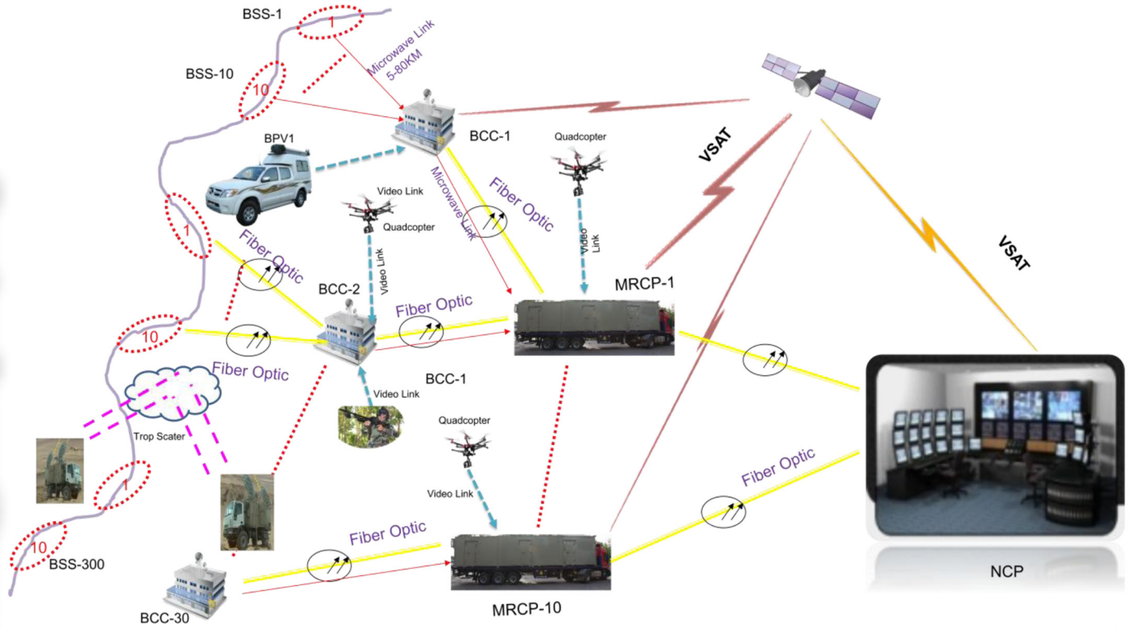
- Video conference system
- ICS console for gaining access to various radios and intercommunication
- Facsimile terminal
- Equipped with 46” wall mount display
- Welfare facilities

Available Services

- Various data/telephone communication (between the systems, consoles, and local/PSTN switchboards), HOTLINE, video conference, voice recording, video and sight surveillance services
- Establishing communication with wireless network (radio-telephone) via the ICS system

Border Surveillance Solution

Border Surveillance Command & Control Center (BSC3)

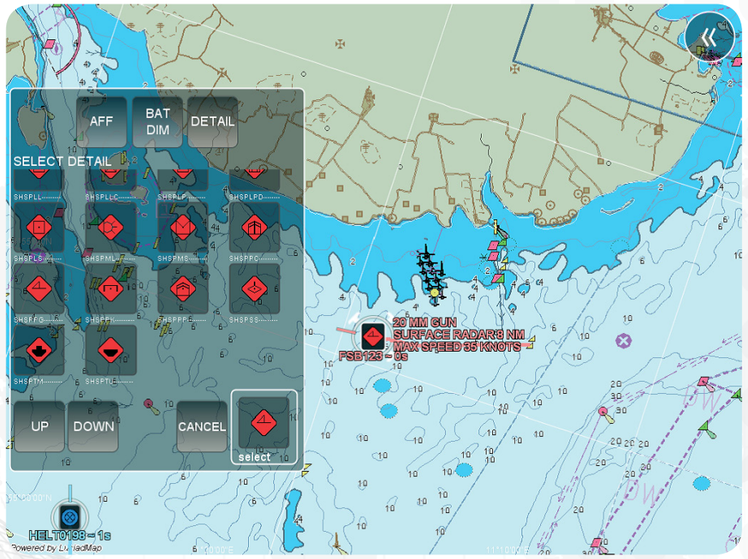


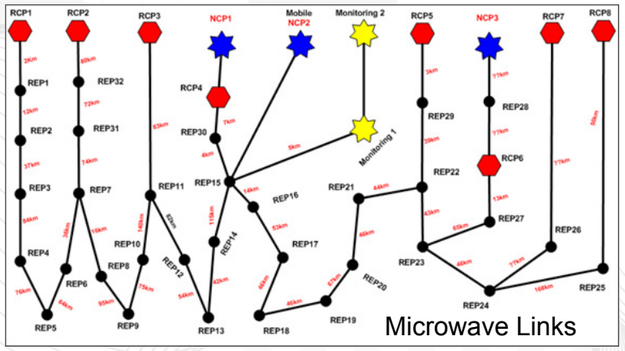
In many countries, there are a lot of border surveillance sensors (fixed & mobile video surveillance systems, range finders, thermal imaging devices, radar, ground sensors, radio frequency sensors, and …) where placed in the border of the country, but monitored and controlled locally. To provide comprehensive situational awareness, increase reaction capability and cooperation between troops along the country border uniquely, a central operation center is developed to be called Border Surveillance Command & Control Center (BSC3).

BSC3 includes:

1- Monitoring and surveillance (command & control) center
2- Equipment processing center
3- Radio communication and infrastructure network center
4- Operation center
5- Data center

Border Surveillance Communication Network (BSCN)





To integrate all separated border surveillance sensors information, a comprehensive communication network is required to collect data from sensors and transmit them to the BSC3 to analyzing and making decision by commanders. This communication network includes available infrastructures and new communication systems for covering the region where controlled locally.

BSCN parts:

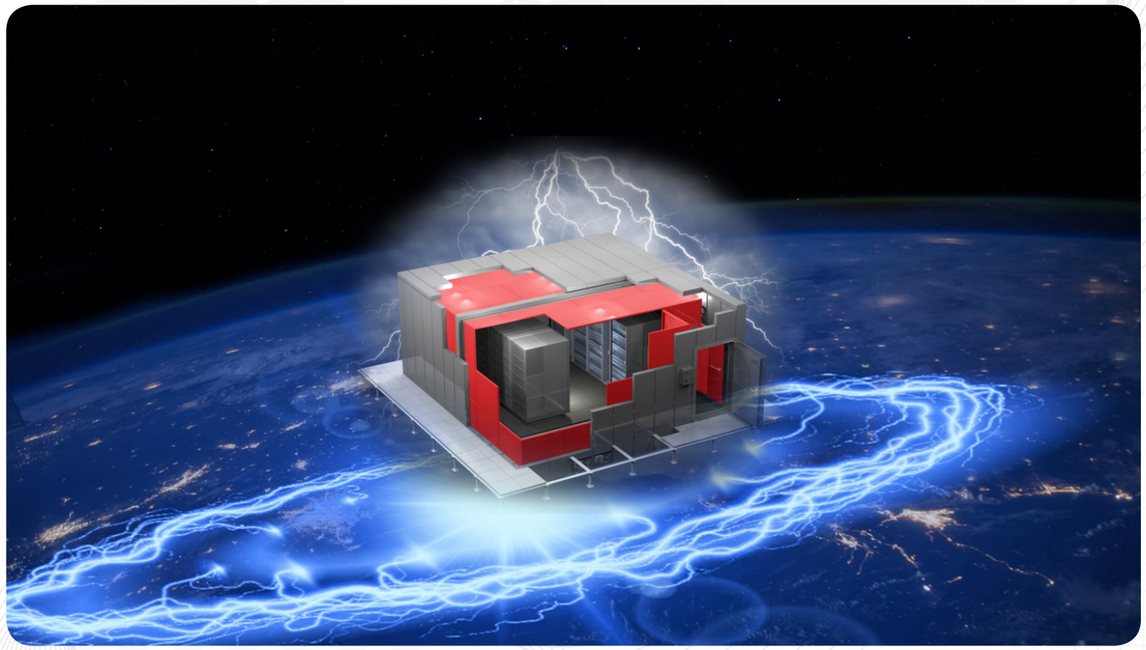
1- Radio systems
2- Infrastructures (Fiber optic, Passive devices, …)
3- Active devices (Switches, Routers, …)
4- Convertors and gateways
5- Antenna masts
6- Processing systems and software
7- NMS

Mobile Border Surveillance Command & Control Center (MBSC3)

Because of the vital role of BSC3 in the surveillance border threats and fast reactions, and due to the fact that the BSC3 has to be active in all conditions, everywhere and every time, thus a Mobile and redundant BSC3 is required that can be replaced with the existing damaged BSC3 in a short time. For flexibility, Easy installation, rapid deployable and transportable to the command center in emergency situations, Mobile BSC3 (MBSC3) is designed. Features of the MBSC3 are similar to the BSC3.

MBSC3 includes:

1- Monitoring and surveillance (command & control) part
2- Equipment processing part
3- Radio communication and infrastructure network part
4- Operation part
5- Data Storage and Logging part
6- Shelters on Trailer



Vital EMP Protected Center

Vital EMP Protected Centers

The threat of an EMP attack is more real today than ever. EMP is a threat for vital centers such as: command and control centers, national security, data centers, telecommunications, transportation sector, bank and financial services, security systems, the electricity distribution infrastructures, hospitals, oil/gas industry, water treatment facilities and other susceptible electrical systems.
The only sensible way to protect data and equipment from a HEMP (High power EMP) or IEMI (International EMI) attack is utilizing EMP shielding room/shelter. This electronically conductive enclosure has all penetration electronically shielded to prevent an EMP from destroying or disrupting the purpose of the electronics inside.
Designing and manufacturing the shielded room/shelter protected against electromagnetic wave with 80dB shielding factor in frequency range of 10 KHz to 18 GHz which causes materials and equipment includes specific conditions and proper quality. From shielding factor and frequency range, this room/shelter is special and individual.

Shielding performance

Model	Magnetic Field			Plane Wave	Microwave			
	14KHz	100KHz	200KHz	50-1000 MHz	1-10 GHz	18GHz	26GHz	40GHz
TMG-SE-A	50dB	60dB	75dB	80dB	80dB			
TMG-SE-B	63dB	80dB	90dB	90dB	90dB			
TMG-SE-C	75dB	90dB	100dB	100dB	100dB	80dB	80dB	80dB
TMG-SE-S	50 MHz – 1 GHz>80 dB							

Air Traffic Control Tower (ATC)

Air Traffic Control Tower (ATC)

ATC can provide advisory services to aircraft in non-controlled air space. Primary purpose of ATC is to prevent collisions, organized and expedite flow of air traffic and provide information and other support for pilots.
ATC includes the following systems:

- Airfield Lighting Control
- MET Info Display
- Nav-Aids Status Monitoring & Control
- D-ATIS / VOLMET
- AMHS
- Data link Departure Clearance
- Flight Data
- Publications
- Maps
- CAT III Status Panel
- Crash Alarm / Red-Telephone
- AFTN /AMHS Display
- Direction Finder
- GPS Time
- Tower Cabin Task Lighting
- Video Surveillance
- Entrance Control
- Data logging of all I/O systems
- Alarm Monitoring & Control
- Radio Control Panels

Mobile Air Traffic Control Tower (MATC)

The mobile control tower has the same capabilities as the fixed control towers. Mobile ATC towers can be used to establish safe air traffic control for smaller airports, military deployments, airport visual control room (VCR) refurbishment, disaster relief or especial events worldwide.
All solutions are designed for simple rapid deployment by the minimum number of personnel and can be supplied with the ATC equipment based on the requirements.

Mobile, robust and reliable design

The ATC cabin is built according to the specifications and dimensions of ISO 20 (1 C) type containers, so it can be easily transported by truck, Hercules aircraft, helicopter, or by road. Once installed on a heavy duty lifting trailer, only a tow vehicle is required.

Capabilities

- Various HF/VHF/UHF radio communication systems
- Complete meteorology equipment
- Multi-layer voice communication with pilot of plane/helicopter
- Up to 6m height from the ground using hydraulic/mechanical mechanism
- Independent diesel power generator
- Obstacle Light

Marin Communication Solution

Coastal Communication Vehicles

Providing communication infrastructures in various layers and war condition for establishing secure and reliable communication with commanding/operational fixed/mobile units of naval forces, coast surveillance units, civil communication centers, and … are important. Therefore, considering need of establishing reliable communication in abovementioned conditions, TCS-442 multilayer communication solution has been designed and manufactured. Whereas this solution is equipped with various communication equipment, operating the solution for establishing regional/trans-regional communication cause increasing quality, security, and … for establishing communication infrastructures between military units.

Marin Communication Solutions

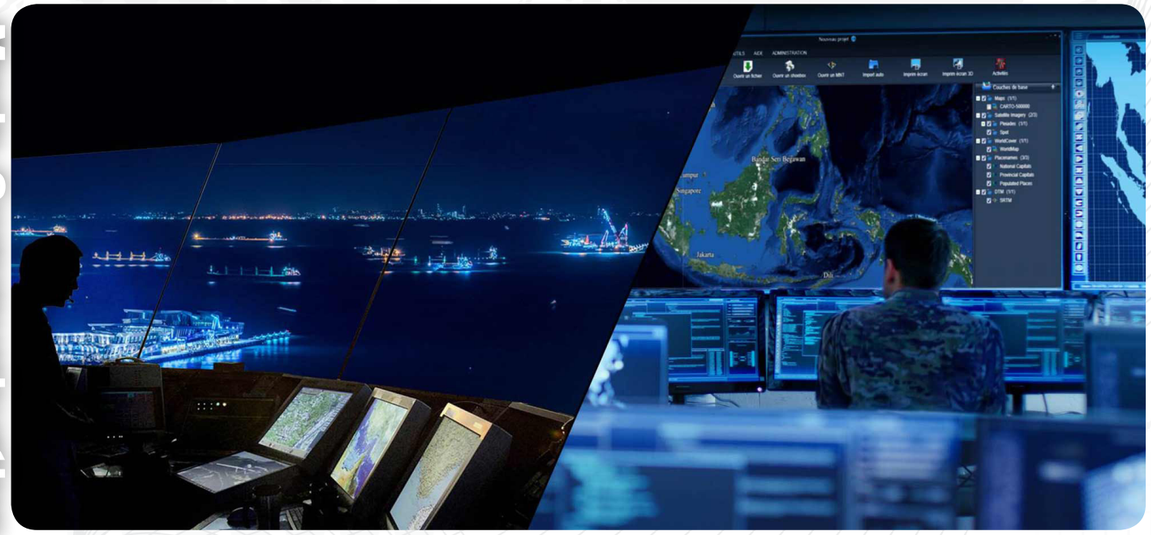
Capabilities

- Capability of establishing communication in the HF/VHF/UHF bands
- Capability of establishing communication via pair wire, fiber optics, and Ethernet
- Equipped with the tactical voice ICS
- Equipped with power generator for providing emergency power supply

Dimension of the solution

Indoor dimension of the communication shelter: length: 4.5m, width: 2.2m, height: 2.2m

Marine Internal and External Communication Systems



In order to establish radio communication between the vessels, vessel and coast station, helicopter, and fighter a set of radio solutions are needed to cover the desired communication layers. Considering mission of the surface vessels, different communication layers are used for establishing communication so that each one is called a communication layer. It can be categorized into one of the A1 to A4 classes according to marine rules and distance of the vessel from coast.
Effect of electromagnetic interference and the considerations related to propagation in the sea as the EVAPORATION DUCT, marine standards, GMDSS, and SOLAS along with the last changes in marine conventions are considered in designing radios of each communication layer. For easy operation, all communication layers are accessible via the ICS (Integrated Communication System).

Communication layers for military vessels are as follows:

Tactical communication layers

- First communication layer in the range of 2-30 MHz and tactical HF band equipped with modem for data transmission
- Second communication layer in the range of 30-80 MHz and tactical VHF-LB equipped with modem for data transmission, encryption system for security, and frequency hopping capability for establishing reliable communication in jamming condition
- Third communication layer in the range of 108-138MHz and airborne VHF band
- Fourth communication layer in the range of 225-400 MHz and tactical UHF band

Communication layers based on the GMDSS regulations and A1 to A4 marine classes

- First communication layer in the range of 147-174 MHz and marine VHF band
- Second communication layer in the range of 2-30 MHz and marine HF band
- Third communication layer in the range of the Inmarsat C satellite
- Fourth communication layer including the NAVTEX, SART, and EPIRB marine transponders
- Integrated communication console based on the marine regulations

ICI plays role of equipping this class of destroyer mainly from external communication and intercommunication.

External communication

In order to establish radio communication between the vessels, vessel and coast station, helicopter, and fighter a set of radio solutions are needed to cover the related frequency bands. Considering mission of the surface vessels, different frequency bands are used for establishing different types of communication so that each one is called a communication layer.
Effect of electromagnetic interference and the considerations related to propagation in the sea as the EVAPORATION DUCT, marine standards, GMDSS, and SOLAS along with the last changes in marine conventions are considered in designing radios of each communication layer.
For easy operation, all communication layers are accessible via the ICS (Integrated Communication System).
Frequency bands used for each communication layer are as follows:

- Range of 2-30 MHz of tactical HF band equipped with modem for data transmission
- Range of 30-80 MHz of tactical VHF-LB equipped with modem for data transmission, encryption system for providing security, and frequency hopping capability for establishing reliable communication in jamming condition
- Range of 108-138 MHz of airborne VHF band
- Range of 225-400 MHz of marine tactical UHF band

Intercommunication

Considering complication of cabling and difficulties of analogue systems in intercommunication of wave one vessel, in this vessel, IPBASE digital systems are used to operate all computer networks, CCTV, and intercommunication of the vessel through this infrastructure simultaneously without interference as well as establishing a low size cable network.

Intercommunication of this vessel includes interphone system, intercommunication system, public announcement, interphone, and emergency telephone. A set of warning alarms including life buoy and check fire are considered too in this solution for safety in the sea. Except emergency alarms and emergency telephone, they function according to IPBASE system and under the LAN. In addition, some facilities such as television, radio, and music player are considered in this infrastructure.

Used equipment in this vessel is as follows:

1- MRC-150 150W marine HF radio and KUM-803 antenna
2- MRC-400 400W marine HF radio and KUM-803 antenna
3- VRC-2500 VHF-LB radio and AT30~90 antenna
4- SRC-120 marine VHF radio and AT136~174 antenna
5- IM-805 VHF radio along with the related modem and AT136~174 marine antenna
6- IP-795 VHF-LB handheld radio
7- PRC-58 VHF-LB manpack radio
8- GBR-1000 UHF stationary radio with the R&S antenna
9- GBR-160 VHF-HB radio with the R&S antenna
10- PRC-110 HF manpack radio
11- ICS central switch
12- Voice terminal, ICS operating console, and PANEL PC for the ICS remote control
13- SAILOR 6000 GMDSS console
14- R&S EK896 VHF-HF receiver
15- Intercommunication equipment including intercommunication system, interphone, public announcement system, entertainment facility, CCTVs, emergency voice telephone, life buoy alarm system, and check fire

Repair Center

Various Repair Centers

Based on the mission type, repair centers include two main groups that are as follows:

- Fixed Repair Station
- Mobile (moveable) Repair Station

Repair centers are classified as follows:

Class A: in this centers, all process of building the fixed repair center including designing and planning, foundation, structure, and … and all process of the mobile repair centers including to provide proper vehicle, designing and manufacturing the shelter and equipping it, and … are accomplished by the supplier.
Class B: in this centers, all process of renewing, optimizing, and equipping the building available inside the buyer location are accomplished by the supplier.
Class C: in this centers, considering that proper building and trained persons are available inside the buyer location, providing and delivering the measuring/repairing equipment are accomplished by the supplier according to the list agreed with the buyer.

Features and Necessities of the Fixed Repair Centers

This type of repair center should be equipped with measuring equipment and necessary tools and facilities for repairing and testing the communication equipment in the frequency range and power needed for military customers in up to module level (replacing the modules).
Used equipment and tools especially measuring equipment should be high quality and high accuracy.
Needed spare components and modules especially fast use modules/equipment should be available.
Various communication equipment used by military customers should be available as reference equipment.
The center should be equipped with protecting equipment (such as the UPS with proper power, fire alarm system, standard wiring/earthing, power dispatcher, and …
The center should be equipped with power generator with proper power for using when the Mains power is not available.
Environmental conditions of the center (acceptable stability of the building, enough light, neatness/cleanliness, air condition system, and …) should be proper.
The center should include proper space for storing the spare modules/components.
A set of standard masts preferably guyed masts (with proper height) should be available inside the center for performing field tests of the repaired radios.

Features and Necessities of the Mobile Repair Centers

This type of repair center should be equipped with measuring equipment and necessary tools and facilities for repairing and testing the communication equipment in the frequency range and power needed for military customers in up to module level (replacing the modules).
Used equipment and tools especially measuring equipment should be high quality and high accuracy.
Needed spare components and modules especially fast use modules/equipment should be available.
The center should be equipped with protecting equipment (such as the UPS with proper power, fire alarm system, standard wiring/earthing, power dispatcher, and …
The center should be equipped with power generator with proper power for using when the Mains power is not available.
Environmental conditions of the center (enough light, neatness/cleanliness, air condition system, and …) should be proper.
Mobile repair center including a set of vehicle and shelter should be designed so that when the vehicle is moved through rugged and rocky paths, shelter and its equipment are protected against every damage.
Shelter of the mobile repair center should be resisted against bad climate conditions (snow, rain, and dust).
The center should include proper space for storing the spare modules/components.
A set of telescopic pneumatic/winch masts (with proper height) should be available with the center for performing field tests of the repaired radios.

Field Hospital

Mobile Hospital

Field Hospital

Mobile hospital is actually combination of medical centers, which easily could be transported, arranged, connected and established; and could be ready to provide medical services.
Mobile hospital solutions are designed to serve fast and reliable medical services for civil treatment, and far areas in critical/pandemic situation especially for COVID-19. According to the mobile design, mobile hospital allows to use on-board medical services, and it provides quick succession and solutions in difficult conditions with a self-sufficient way independently.

Features

- Easy and quick transportation and installation
- Could be transported via truck, trailer, train, ship, airplane
- Operating in chemically/biologically polluted area
- Supporting facilities like air-conditioning system, electricity and water
- Expandable to increase number of beds
- Different arrangement based on the situation and field status
- Operating in different environmental situations

MISSIONS AND FUNCTIONS

- Providing periodical medical services for the deprived areas which could not receive continuous services
- Providing medical services for the war-affected or natural disaster affected areas
- Preventing outbreak of infectious diseases and performing the process of quarantine
- Supporting the country hospitals by hospitalization of emergency patients while infectious disease increment
- Cooperating in identification and treatment of patients infected with corona-virus
- Providing humanitarian services to the countries which need medical services
- Providing medical services in occasional gathering and marches
- Suitable substitution for field hospitals of the military units

Different medical units can be implemented on the trailers such as: Surgery unit, Support for surgery unit, Radiology, Patient ward, Clinic, Triage & Emergency, ICU, Laboratory, CT-scan, Dentistry, Optometry, Pharmacy, Corridor and Management. In addition to the medical units, welfare units and units for the hospital accessories can be implemented, such as: Generator, on call for men and women, Restrooms, Rest unit for employees, Clean and dirty warehouse, bathroom, Medical clothing and equipment storage.

Radio/Television Solution

Mobile Radio Transmitting Solution

This solution is considered for public announcing the last news, information, and … to a zone residents where infrastructures of radio/television communication are destroyed due to flood, earthquake, storm, and war. In addition, in order to perform psychological operation for residents of the zones at common border with belligerent countries in war, the solution operated. After establishing this tactical solution at desired locations, it functions as a radio station using powerful transmitters to cover the news by performing psychological operation for the zone residents. Desired solution can transmit radio signals through an operational radius up to 40Km2 as well as voice propagation through maximum 200m using a mixer system and powerful loudspeakers. Whereas radio signals should be received by general public, frequency range of the radio transmitters installed inside the solution is considered the non-military FM band. In order to establish reliable/secure communication with the command center, this solution is equipped with radio equipment in different HF and VHF communication layers.

Capabilities

- ✓ Establishing the FM radio transmitter in zone with maximum 40Km2
- ✓ Capability of controlling the solution remotely through up to 100m radius
- ✓ Equipped with radio equipment in HF and VHF communication layers
- ✓ Transmitter operation using wireless microphone in a long communication distance
- ✓ Equipped with pneumatic mast for installing the antenna
- ✓ Equipped with emergency supply system when the Mains power is not available

Dimension of the solution

Indoor dimension.....length: 2290mm, width: 1480mm, height: 1400mm
Vehicle type.....TOYOTA

Mobile Studio Solution

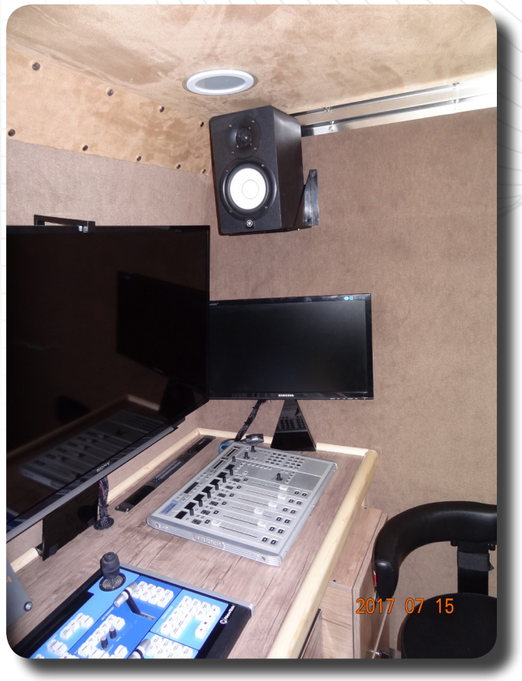
Actually mobile studio solution including a cabin included vehicle equipped with various filming/editing systems can film from three points with 50m distance as Full HD simultaneously, perform live editing process, change it to common formats, and finally copy the output. In this solution, proper facilities and capabilities have been considered for generating media with Full HD quality.

Capabilities

✓ Filming equipment and its accessories including camera, camera base, microphone, and related cables
✓ Editing/converting/recording equipment compatible with all current formats
✓ Lighting equipment
✓ Providing input supply of the solution whenever, everywhere, and in every climate condition considering two-purpose supply cables via the Mains power and or 6KVA power generator as well as two 3KVA and 10KVA UPSs
✓ Considering a set of necessary equipment such as air condition system and vehicular refrigerator for relative welfare of the operators
✓ Proper holders for fixing the equipment installed inside the solution to prevent them from probable defection due to vibration while moving the vehicle/solution
✓ Protecting all metallic components of the solution such as screws, nuts, and rivets against corrosion
✓ Protecting the solution against rain
✓ Insulating the solution from noise

Dimension of the solution

Indoor dimension.....length: 3m, width: 1.9m, height: 1.8m
Vehicle type.....VAN



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IRAN
ELECTRONICS
INDUSTRIES

Nobonyad Sq., Tehran, Iran
Tel: +98 (21) 22817947
Fax: +98 (21) 26751806
P.O.Box: 19575/131
E-mail: Info@telecom-ici.com
www.telecom-ici.com