C4ISR System
Shipborne Communication System GS-2400

Joint and combined military operations and multinational missions are driving the change from platform-centric operations to network enabled operations. Glocom supports ITCCS for stationary, land mobile, shipborne, airborne and soldier with high-tech information technology with excellent communication technology. Hereby, the shipborne system is designed for all kinds of shipborne applications in navy.

ITCCS (Integrated Tactical Command & Control System) GS-2000 is an integral whole of various tools used for accurate understanding of battlefield situations, decision-making, speedy and correct implementation of tasks, and conduct of operational simulations and emulations.

C4ISR system is largely composed of sensors dedicated to tactical intelligence gathering, surveillance, and reconnaissance; a command and control system for accurate understanding of battlefield situations on the basis of real-time information sharing and analysis, as well as rational decision-making and speedy transmission of orders; and a field management system comprising weapons management system, operation management system, etc., which encompass various kinds of combat equipment, personnel, and all other elements that take part in battles and wars either directly or indirectly.
At a glance

The Glocom shipborne communication system GS-2400 is designed for stationary command & control center and shipborne applications in various kinds of civil and military ships. It belongs to a new generation of military information processing system that feature innovative designs, high modularity and in particular outstanding specifications.

New concepts for network operations

Network enabled operations in joint and combined military operation require new concepts for radio communications at sea, on land, and in the air. Shipborne equipment and subsystems from Glocom fit seamlessly into the integrated onboard command, sensor, and effector network and in the wireless communication networks between allied ships. In addition, flawless communications with airborne platforms and ground-based forces is ensured. Glocom’s shipborne communication system meets these naval communications challenges using existing technology and new intelligent concepts.

New concepts for navy

All most navies are faced with wide reaching changes to their operational environments. Their missions evolve from purely national or alliance defense to a variety of out-of-area missions. For example, the armed forces of several countries are increasingly being divided into intervention, stabilization, and support forces.

For instance, when navy ships are assigned to stabilization forces for conflict prevention and crisis management missions, this nowadays means long terms of duty in deployment areas scattered around the world for the smallest possible crew contingents. Current ship designs must therefore satisfy the following criteria:

- Intensive use
  The technical design must enable a term of duty of up to two years in the deployment area, also under extreme climatic conditions, without requiring regularly scheduled shipyard maintenance.

- Dual crew concept
  The technical design of the ship must support a dual-crew concept with crew rotation every for months.

Reduced crews cannot master the broad task spectrum of these ships in stabilization missions unless they are assisted by a significantly higher degree of automation of all systems. In addition, long terms of duty place high demands on the availability and reliability of all systems.

All parties concerned thus face major challenges, since modern radio communications systems must be upgraded to high-performance, reliable, and user-friendly integrated systems by using currently available technology and taking into account the required characteristics.

System functions

- Position reporting on digital map
- Sharing of radar information
- Sharing of command & control information
- Real-time sharing of situation awareness information
- Remote control access via local area network
- Military operation planning, simulation & emulation
- Sharing of mission control data
- Evaluation/review of military operation
Benefits and key features

Unrivaled radio parameters
- Wide range of radio frequencies
- Excellent RF characteristics
- Robust design for unfavorable RF conditions
- Fully digital processing for RF

Flexible range of applications
- Free installation in anywhere
- Highly modular design enables scalable radio systems
- Local or remote operation
- Flexibility when selecting the voltage source (wide DC voltage inputs, AC power supply)
- Suitable for fixed, mobile, aircraft operated by air force, army and navy
- Software defined radio concept
- Wireless interface in range of ship

Secure communications
- EMP (ECCM) methods for anti-jam communications
- Tap- and spoof-proof communications through integrated encryption
- Methods for secure data transmission over TDMA based radio networks

Low maintenance efforts
- IP based maintenance tool
- Powerful built-in test (BIT)
- Automatic adaptation to ambient conditions
- Rugged design, suitable even for difficult environmental conditions - high reliability

Easy of operation
- Menu-oriented user interface and PC based tools
- Convenient and easy link establishment

Flexible and safe investment for the future
- Hardware and software upgrades
- Future changes in standards can be taken into account in product and program planning
- Low life-cycle costs
The Glocom GR series radios offer military customers a wide range of interfaces and associated proprietary frequency hopping waveforms, as well as radio communications schemes that conform to military standards like STANAG & MIL-STD. Military data transmission methods such as data link systems are also supported. To ensure that existing GR series radio systems remain in up-to-date, their functionality can enhanced through subsequent software downloads and, if necessary, by using new hardware modules.

With this range of functions, GR series radio family serves as a seamless communications equipment between the various military forces and civil units.
C4ISR System
GS-2400 Shipborne System

ATCOM
UHF
Secure voice/data link
UHF
Secure voice/data link
UHF
Secure voice/data link
On-shore: Secure voice/data link
VHF/UHF
Secure voice/data link
HF

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GR-400
UHF 10W EPM data radio

GR-520
UHF 10W HCDR

GR-600
PRR

GR-610
SPR

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GR-350
VHF/UHF radio

GR-310
VHF/UHF radio

GR-**3
Remote control unit

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Unrivaled radio parameters

Wide range of radio frequencies

The Glocom radio supports the radio frequency from 1.6MHz to 2.4GHz which is very wide for all range of communication. It includes HF, VHF, UHF, 2.4GHz radio bands, and it combined in a system and managed by remote operator through network.

Excellent RF characteristics

The Glocom GR series radio family features excellent RF characteristics. The combination of analog and digital technology provides high signal purity that results in optimal transmission quality and extremely clear voice communications. Very fast frequency hopping in addition to compatible filter methods yield on optimal RF signal spectrum. This significantly reduces collocation influence that is typically caused by adjust transmit and receive stations.

The frequency generation in the Glocom GR series radios is performed by a special, state-of-the-art synthesizer module to provide spectrally-pure signals and to ensure high-quality radio links. Very rapid frequency generation and frequency setting enables the use of fast EPM(ECCM) waveforms without having to sacrifice the high quality of the RF signals.

Robust design for unfavorable RF conditions

The Glocom GR series radio systems are prepared for operation in unfavorable RF environments. Even antennas that create a high voltage standing wave ratio (VSWR) can be connected without difficulty. The negative impact of high receive levels is compensated for by the excellent RF large-signal immunity, leading to outstanding voice and data transmission quality. Protection circuits prevents damage from occurring to the Glocom GR series radio modules.

Fully digital processing for RF

The former version of Glocom HF radio GR-100 has combined the unmatched dynamic range of radios with analog mixers with the latest in digital IF and audio signal processing. The second IF frequency of 455KHz is sampled, digitized and processed using digital signal processors. This means that a wide range of IF bandwidths is available in all modes with high selectivity and optimized for voice and data communications. Digital signal processing also has provided functions for noise suppression.

But new version of Glocom HF radio GR-150 doesn’t use any mixer or IF processing. It just converts the RF signal into digital signal using high speed and high resolution A/D converter. All processing of signal has been done by ultra high speed signal processor, so it is truly SDR (software defined radio) which can be compatible with a variety of wave forms. Because of this excellent technology, Glocom radios are compatible with future oriented waveforms, and support unmatched wide dynamic range.
Flexible range of applications

Free installation in anywhere

The Glocom radios are designed to use in portable, station-
ary, vehicle, shipborne and airborne. It can be installed in
any 4-wheel vehicle, tanks, ships and airborne. Almost of
radios are designed ““jerk-and-run”” concept, so it is very
easy to configure vehicle system from portable version. If
any vehicles are defective, it can take out just, and can be
use in portable purpose.

Highly modular design enables scalable radio systems

Almost of the Glocom radios are using
same radio casing, same modules for front panel module,
keyboard module, DSP (digital signal processing) module,
power supply module. Only differences are RF module and
RF power module. In case of software defined radio, RF
module is also same, because they are using same A/D con-
verter module and DSP module. It supports great benefits
for maintenance & logistics of radio system. The only dif-
fERENCE is the software inside. It means the radios can be
upgraded for new standards or application without any
change of hardware, so we can support the update of radio
in field environments. It means feature oriented system
design for Glocom radios.

Local or remote operation

The Glocom GR series radios support local or remote operation
functions. There are clear LCD which is clear in day & night time.
There are total 18 keyboards, and it makes to edit the radio param-
eter, or to control the radio with high flexibility. The radios can be
controlled by local host computer system using GR-910 integrated
tactical data system software. The man machine interface is exact-
ly same with real one. The radios can be controlled remotely with
professional remote controllers which are designed by Glocom in
accordance with each model. It can expand the remote control
area up to 2Km using twist-pair cable.
Flexible range of applications

Flexibility when selecting the voltage source
(Wide DC voltage inputs, AC power supply)

All Glocom radios come with wide range of DC inputs. There are optional DC power supply adaptors, so it can be chosen according to the installation conditions. An external multi range AC power supply available from Glocom enables operation or the radio with conventional AC power grids. The power supply is monitored automatically by means of a BIT function in the system. The AC power supply complies with current standards and contains active power factor correction. Supply voltage fluctuations are compensated for without affecting operation of the radio.

Software defined radio concept

All software elements of the Glocom radio system, including the waveforms and software options, can be loaded into the radio as needed by using the A/S and maintenance tool. Numerous software packages are available for this purpose. This approach also allows functional enhancements to be loaded at a later time with this approach. That means existing software functions can be enhanced without opening the radio or replacing hardware modules.

The current status of the software is shown in a comprehensive inventory report, which contains the status of all versions of the software and its components.

Suitable for fixed, mobile, aircraft operated by air force, army and navy

Military ship and aircraft place a variety of demands on the radio with respect to environmental impact such as g-force, vibration and temperature range. Furthermore, army, air force and navy platforms must sometimes support special applications in the variable frequency ranges. The Glocom radios offer a wide bandwidth to support a variety of applications.

Wireless interface in range of ship

The electric wiring in small space of air force, ship borne, vehicle would be brought on the intricate problems. Especially, electric wiring in air-tight space of air force is very difficult for modernization of old airborne and ships. The connecting the tactical terminal and equipment with individual solders of airborne, ship borne and special forces is also inconvenience and dangerous from them. Glocom supports the clear solutions using Wi-Fi technology. The wireless intercom system using wireless interface is very convenient in ship, vehicle and stationary, so it is very flexible to installation in field environment.

Stationary system (interior configuration)
Secure communications

EMP (ECCM) methods for anti-jam communications

Electronic protective measure (EPM) protect radio links from electronic counter measures (ECM) such as jamming and unlicensed listening. Frequency hooping is an EPM (ECCM) method that is available as an standard in all Glocom radios. This function in other brand radios are an built-in standard function which is very strict to permit, and very expensive. All other companies supports this function with optional, and it is very expensive. The frequency hopping algorithm is compatible with defacto-standard method like STANAG or MIL-STD. It is also available to be customized in accordance with the end user’s requirements. These methods ensure a jam-free radio link in any environments.

Glocom also developed the Glocom Intelligent Frequency Hopping (IFH) technology, which provides effective radio link use against active jamming even in confused frequency band. It can also encrypt voice and data transmission up to 1000bit/s. It has been tried and tested around the world for many year. This method is integrated in Glocom radios, and it is open for the end customers to provide the flexibility to participate in national and international missions. When using the Glocom frequency hopping technology method, voice communications are compressed by means of a MELP 1000, MELP 2000 or CVSD vocoder and then transmitted digitally.

Tap- and spoof-proof communications through integrated encryption

To protect radio links from tapping and spoofing, the information being transmitted can be encrypted. With Glocom radio family, Glocom was one of the first manufacturer to offer embedded encryption. It eliminates the need for an additional encryption device. The Glocom radio therefore saves space, reduce weight and is easy to install in the small space like ship, vehicle and aircraft. The encryption algorithm is also customizable by end user, so no need to worry for national compatibility.

The standard encryption method is compatible with defacto-standard like 3DES(256bits). To load the encryption keys, different protocols are provided, like keyboard, computer or wireless fill-gun (OTAR).

Methods for secure data transmission over TDMA based radio networks

The following picture shows TDMA data link system which supports the secure data transmission for tapping and spoofing proof. It’s a essential technology for the construction of C4ISR system.
Low maintenance efforts

The Glocom radios were developed with low maintenance effort in mind. A variety of control and monitoring functions are available that furnish the user with detailed status information about radios. In addition, built-in test functions permit service and maintenance tasks to be carried out in a targeted manner. The radio systems can be remotely analyzed, eliminating the need for on-site service. Resistance to vibrations and a wide operating temperature range allow the systems to be used in diverse applications.

IP-based maintenance tool

The IP-based Glocom service and maintenance tool is a vital accessory for the Glocom radio systems. It works in any standard IP network, requires standard cable or device drivers and is ready to be used on conventional laptop computers.

Wealth of useful functions are available that can not only track the status of the radios in detail, but also transfer configurations from one radio to another. This function, described as cloning, permits the fast, time-saving and error-free dissemination of radio-specific settings to the Glocom radio systems. Cloning makes it easier to replace a system with another system of the same type such as when service and maintenance is required. The Glocom service and maintenance tool is also used to load the radio software.

Powerful built-in test (BIT)

In addition to the normal power-up BIT (PBIT) and continuous BIT (CBIT), the Glocom radio also features an initiated BIT (IBIT) for checking the receive and transmit functions of the system. The transmitter and receiver are tested simultaneously by means of an internal loopback that routes the transmitter signal directly back to the receiver. The radio then analyzes the signal in the receive side and documents any deviations. The IBIT can be carried out after expanding and reconfiguring the radio, following a software download or also in regular cycles, all without external test equipment.

Automatic adaptation to ambient conditions

When ambient conditions such as temperature, supply voltage or VSWR are outside the permissible range, the transmitter will decrease its own power stepwise in order to maintain operation as long as possible. If ambient conditions return to normal, the transmitter will revert to normal condition without requiring any manual intervention. The user is notified of this status via a message. The radio monitored by means of temperature sensors. Cooling levels are automatically adapted to the ambient conditions.

Rugged design, suitable even for difficult environmental conditions - high reliability

The Glocom radios feature a robust design and high quality components. The result is high MTBF. The radios are tested in accordance with various military and civil standard such as MIL-STD-461 and MIL-STD-810.

To prevent damage, the devices automatically continue to operate at reduced power if overheating occurs. When the temperature normalizes, the device automatically returns to the original power level without manual intervention.

The military aviation sector demands a high level of device reliability, particularly in extreme environmental conditions. Whether they are exposed to high g-force in jet aircraft or to heavy vibrations in helicopters and transport aircraft, Glocom radios were designed for such operating environments. This is a key reason why the Glocom radios are deployed by air force, army and navy units around the world.

The MTBF achieved in practice is more than 50,000 operating hours.
Easy of operations

The Glocom radios offer many diverse functions that help ensure straightforward, secure, and error-free operation. The functions are available via hierarchically structured menus and context-sensitive keypads. The well-thought-out concept and the arrangement of the control elements allow the intuitive control of the radio even under difficult conditions from outside.

Menu-oriented user interface and PC-based tools

The user interface of Glocom radios is menu-oriented and easy to use. There is no any mechanical switches except power On/Off rotary switch. Most of functions can be setup using the keypad by one-touch concept. These modes contain the complete setting of parameters such as the transmit power, the channel frequencies, the link mode, the EPM (ECCM) procedure, encryption keys, and other net-specific adjustments. These preset pages are conveniently prepared with a PC or at a central location using GR-910 ITDS software, and are loaded into the radio over the data connector before a mission starts.

Convenient and easy link establishment

The setup of the main functions like mode exchange, link establishment and SMS is very convenient and easy compare other brands. The operator chooses and press the proper keypad, and one more press after ensure, and everything else is done automatically. The result is reported with sound and display, so the operator can ensure the current mode.

For example, the radio modes of all slave radios in a net will be exchanged automatically, if the master radio is going to change the working mode. It is very convenient feature for the user, so any beginner can use Glocom radio after 1-2 hours training. This function is only from Glocom in the world.
Flexible and safe investment for the future

Hardware and software upgrades
- ALE, 3rd generation STANAG 4538 (fast link setup)
- Data link protocols LDL, HDL from STANAG 4538 (without IP interface)

Low life-cycle costs
- User-friendly operating concept reduces training costs
- High MTBF and low MTTR value (<30min)
The Glocom radios contain less modules and components than a conventional radio since almost all of the functionality is implemented using embedded software. This considerably simplifies the supply and warehousing of spare parts. Problem with obsolete hardware modules are now a thing of the past. Radios with older software versions can be upgraded simply by downloading new software. The different standards that make up the “HF house” also available for Glocom radio family.

Future changes in standards can be taken into account in product and program planning
For example, the “HF house” is a structured overview of different HF standards that have been ratified by the developed countries. There are living standards which are revised at regular intervals. These changes are taken into account as part of the product and program planning for the Glocom radios and provided to customers in the form of software updates.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STANAG 4203</td>
<td>Technical standards for HF radio equipment</td>
</tr>
<tr>
<td>STANAG 4415</td>
<td>Robust waveform, 75bit/s</td>
</tr>
<tr>
<td>STANAG 4285</td>
<td>Single tone modem, up to 3600bps</td>
</tr>
<tr>
<td>STANAG 4529</td>
<td>Single tone modem, up to 1800bps</td>
</tr>
<tr>
<td>STANAG 4539</td>
<td>Single tone modem, up to 12800bps</td>
</tr>
<tr>
<td>MIL-STD-188-110A/B</td>
<td>Single tone modem, up to 12800bps (STANAG 4539)</td>
</tr>
<tr>
<td>MIL-STD-188-141A/B</td>
<td>Automatic link establishment</td>
</tr>
<tr>
<td>STANAG 5066</td>
<td>Profile for HF radio data communications</td>
</tr>
<tr>
<td>STANAG 4538</td>
<td>Automatic radio control system (ARCS)</td>
</tr>
<tr>
<td>STANAG 4444</td>
<td>HF show hopping waveform</td>
</tr>
</tbody>
</table>
Glocom radio communication system on patrol boat for navy

In 2010 match, the customer signed a contract with Glocom for supply and through-life support of new patrol boats for the navy. Radios from Glocom are also on board. The customer says “The purchase of Glocom radio system for patrol boat has enabled us to further develop our excellent working relationship with Glocom. Their products provide a high degree of reliability and availability necessary for modern military communications systems”

The patrol boat is equipped with a modular, flexible communications system that was designed by Global Communications Co. Glocom communication system is a key capability of the new patrol boats that integrates the vessel’s secure and non-secure internal communications system and allows the crew to communicate with military and civil aircraft, as well as with government organizations. Access to the system is available from various locations on the ship, allowing greater flexibility for the crew. The Glocom system integration technology provides distributed switching and multiplexing functions permitting the integration of Glocom radios, filters, and antennas.

Details on the communications equipment from Glocom for the patrol boats

- GR-150 20W HF software defined radio, 1000W RF amplifier, 1000W automatic tuning unit, dipole antenna
- GR-200 20W VHF radio, 50W VHF RF amplifier, whip antenna
- GR-300 20W VHF/UHF radio, 50W VHF RF amplifier, whip antenna
- GR-400 20W UHF data radios, whip antennas
- GR-500 20W UHF DSSS high capacity data radio, whip antenna
- GR-601 2.4GHz personal role radios
- GR-611 UHF secure personal radios
- GR-690 2.4GHz wireless intercom gateway
- Server computer, operation computers, computer network equipment and cables
- Power supply system
- Installation frames and kits
Sample application
(Destroyer communication system)

- **SMS**: Short Message Service (digit direction)
- **CH**: Channel
- **PTT**: Push-to-Talk
- **SQ**: Squelch
- **MC**: Mode exchange
## Ordering Information

**GS-2400-01 destroyer communication system**

<table>
<thead>
<tr>
<th>№</th>
<th>DESCRIPTION</th>
<th>MODEL</th>
<th>BRAND</th>
<th>UNIT</th>
<th>QTY</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>HF EMP radio, 1000W, 1.6-30MHz, SSB, AME, PSK, FH 10bps, Digital secure, 110-4800bps, ALE, ACS</td>
<td>GR-150,GR-101E, GR-102E</td>
<td>Glocom</td>
<td>Set</td>
<td>1</td>
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<tr>
<td>2</td>
<td>VHF EMP radio, 50W, 30-88MHz, FM, FH 100bps, Digital secure AES 256bits, 600-9600bps</td>
<td>GR-250,GR-201B</td>
<td>Glocom</td>
<td>Set</td>
<td>1</td>
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<tr>
<td>3</td>
<td>VHF/UHF EPM radio, 50W, 30-512MHz, FH, Digital secure, 600-9600bps</td>
<td>GR-310,GR-301B</td>
<td>Glocom</td>
<td>Set</td>
<td>1</td>
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<tr>
<td>4</td>
<td>UHF EMP data radio, 20W, 430-480MHz, FH 100bps, Digital secure 256bits, TDMA 64 time slots, 600-9600bps</td>
<td>GR-400</td>
<td>Glocom</td>
<td>Set</td>
<td>4</td>
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<tr>
<td>5</td>
<td>2.4GHz PRR, 100mW, 2.4GHz, DS-SS, Full-duplex up to 4 users, unlimited listeners, 256bps, 300-1000m range</td>
<td>GR-601</td>
<td>Glocom</td>
<td>Set</td>
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<td>6</td>
<td>UHF SPR, RF 2W, 440-470MHz, Digital secure 256bits, Full-duplex up to 6 users, Data rate 256kbps, Range 300-3000m</td>
<td>GR-611</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>7</td>
<td>ADS-B receiver, 1090MHz, MODE-S, 250nm, 19” rack-mount</td>
<td>GR-452</td>
<td>Glocom</td>
<td>Set</td>
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<td>8</td>
<td>AIS receiver, 161.975MHz, 162.025MHz, 12.5KHz, 25kHz, GMSK, 9600bps, TDMA, 400-8000Km</td>
<td>GR-456</td>
<td>Glocom</td>
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<td>9</td>
<td>Server system, Intel 2xXeon 2130MHz, 8GB, 500GB</td>
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<td>Branded</td>
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<td>10</td>
<td>Tactical computer, Intel core i3-3.2GHZ, 21.5” LED display, 500GB HDD, 1x2GB DDR</td>
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<td>Branded</td>
<td>Set</td>
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<td>11</td>
<td>24 port Switching hub</td>
<td>GE-100</td>
<td>Glocom</td>
<td>Set</td>
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<td>12</td>
<td>RS-232 to Ethernet converter</td>
<td>GE-402</td>
<td>Glocom</td>
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<td>13</td>
<td>Remote control unit</td>
<td>GR-x03</td>
<td>Glocom</td>
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<td>14</td>
<td>Co-site filters</td>
<td>GR-x91</td>
<td>Glocom</td>
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<td>15</td>
<td>Power supply (UPS, battery, AC/DC converter)</td>
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<tr>
<td>16</td>
<td>Integrated Tactical Data System (ITDS) software</td>
<td>GR-910</td>
<td>Glocom</td>
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<td>17</td>
<td>Wireless Gateway System (WGS)</td>
<td>GR-920</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>18</td>
<td>Integrated Tactical Command &amp; Control System (ITCCS)</td>
<td>GR-930</td>
<td>Glocom</td>
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Sample application
(Missile/Patrol boat communication systems)
# Ordering Information

**GS-2400-02 missile/patrol boat communication system**

<table>
<thead>
<tr>
<th>№</th>
<th>DESCRIPTION</th>
<th>MODEL</th>
<th>BRAND</th>
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<tr>
<td>1</td>
<td>HF EMP radio, 100W, 1.6-30MHz, SSB, AME, PSK, FH 10bps, Digital secure, 110-4800bps, ALE, ACS</td>
<td>GR-150,GR-101C, GR-102C</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>2</td>
<td>VHF EMP radio, 50W, 30-88MHz, FM, FH 100bps, Digital secure AES 256bits, 600-9600bps</td>
<td>GR-250,GR-201B</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>3</td>
<td>VHF/UHF EPM radio, 50W, 30-512MHz, FH, Digital secure, 600-9600bps</td>
<td>GR-310,GR-301B</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>4</td>
<td>UHF EMP data radio, 20W, 430-480MHz, FH 100bps, Digital secure 256bits, TDMA 64 time slots, 600-9600bps</td>
<td>GR-400</td>
<td>Glocom</td>
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<td>2.4GHz PRR, 100mW, 2.4GHz, DS-SS, Full-duplex up to 4 users, unlimited listeners, 256bps, 300-1000m range</td>
<td>GR-601</td>
<td>Glocom</td>
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<td>GR-611</td>
<td>Glocom</td>
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<td>ADS-B receiver, 1090MHz, MODE-S, 250nm, 19” rack-mount</td>
<td>GR-452</td>
<td>Glocom</td>
<td>Set</td>
<td>1</td>
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<td>8</td>
<td>AIS receiver, 161.975MHz, 162.025MHz,12.5KHz, 25kHz, GMSK, 9600bps, TDMA, 400-800Km</td>
<td>GR-456</td>
<td>Glocom</td>
<td>Set</td>
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<td>9</td>
<td>Server system, Intel 2xXeon 2130MHz, 8GB, 500GB</td>
<td>Branded</td>
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<td>Set</td>
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<td>10</td>
<td>Tactical computer, Intel core i3-3.2GHZ, 21.5” LED display, 500GB HDD, 1x2GB DDR</td>
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<td>Set</td>
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<tr>
<td>11</td>
<td>24 port Switching hub</td>
<td>GE-100</td>
<td>Glocom</td>
<td>Set</td>
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</tr>
<tr>
<td>12</td>
<td>RS-232 to Ethernet converter</td>
<td>GE-402</td>
<td>Glocom</td>
<td>Set</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Remote control unit</td>
<td>GR-x03</td>
<td>Glocom</td>
<td>Set</td>
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</tr>
<tr>
<td>14</td>
<td>Co-site filter</td>
<td>GR-x91</td>
<td>Glocom</td>
<td>Set</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Power supply (UPS, battery, AC/DC converter)</td>
<td></td>
<td>Glocom</td>
<td>Set</td>
<td>1</td>
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<tr>
<td>16</td>
<td>Integrated Tactical Data System (ITDS) software</td>
<td>GR-910</td>
<td>Glocom</td>
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<tr>
<td>17</td>
<td>Wireless Gateway System (WGS)</td>
<td>GR-920</td>
<td>Glocom</td>
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<tr>
<td>18</td>
<td>Integrated Tactical Command &amp; Control System (ITCCS)</td>
<td>GR-930</td>
<td>Glocom</td>
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Sample application
(Unmanned surface vessel (USV) communication systems)
Ordering Information

GS-2400-03 unmanned surface vessel communication system

<table>
<thead>
<tr>
<th>№</th>
<th>DESCRIPTION</th>
<th>MODEL</th>
<th>BRAND</th>
<th>UNIT</th>
<th>QTY</th>
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<tbody>
<tr>
<td>1</td>
<td>Video/status transmitter, 935-955MHz, 5W, 2Mbps(video), 9600bps(command), DS-SS/QPSK, BPSK, FEC, DS-SS</td>
<td>GR-510-01</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>2</td>
<td>Command receiver, 2120-2160MHz</td>
<td>GR-510-02</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>3</td>
<td>Control receiver antenna coupler</td>
<td>GR-510-11</td>
<td>Glocom</td>
<td>Set</td>
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</tr>
<tr>
<td>4</td>
<td>Video/status antenna</td>
<td>GR-510-21</td>
<td>Glocom</td>
<td>Set</td>
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<tr>
<td>5</td>
<td>Command antenna</td>
<td>GR-510-22</td>
<td>Branded</td>
<td>Set</td>
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<td>6</td>
<td>RF cable set</td>
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<tr>
<td></td>
<td>Modulator (SMA)-RF amplifier (SMA) cable (10cm), Control antenna coupler (SMA) - control receiver (SMA) cable (20cm), Control antenna coupler ANT-SMA - control antenna cable (SMA) (1m), Video/status transmitter (SMA) - video/status antenna cable (SMA) (1m))</td>
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<td></td>
<td>Glocom</td>
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<td>7</td>
<td>4way power cable(2m), 2way power cable(2m), 2way - 2way power cable(10cm), 7way-8way connect cable(10cm), 5way-5way Tx control cable(10cm), 8way control &amp; data cable(2m)</td>
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<td></td>
<td>Branded</td>
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<td>Command transmitter, 2120-2160MHz</td>
<td>GR-510-04</td>
<td>Glocom</td>
<td>Set</td>
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<td>Video/status antenna coupler</td>
<td>GR-510-12</td>
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<td>Set</td>
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<td>4</td>
<td>Video/status antenna</td>
<td>GR-510-23</td>
<td>Glocom</td>
<td>Set</td>
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<td>Command antenna</td>
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<td>RF cable set</td>
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<td>4way power cable(2m), 2way power cable(2m), 2way - 2way power cable(10cm), 7way-8way connect cable(10cm), 5way-5way Tx control cable(10cm), 8way control &amp; data cable(2m)</td>
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<td>Glocom</td>
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</tbody>
</table>
About Glocom

Global Communications Co. (Glocom) was established in 1996. Glocom is a technology-oriented company that develops, manufactures and supplies various kinds of radio and wire communication equipment, navigation equipment, command and control equipment and other customized equipment for military and paramilitary organizations, secret service and security organizations and specially authorized civilian organizations at home and abroad. Currently Glocom provides customers with hi-tech wireless voice and data radios, modern soldier radios, navigation equipment, IFF interrogators/transponders, air-traffic control equipment, reconnaissance receivers, ultra-high speed parallel processors, various kinds of programs, as well as complete sets of integrated systems such as a battle management system.