MCRP 2-10A.5

Remote Sensor Operations

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UNITED STATES MARINE CORPS

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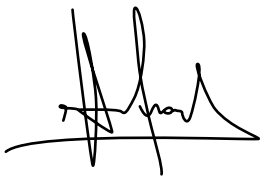
FOREWORD

Marine Corps Reference Publication (MCRP) 2-10A.5, *Remote Sensor Operations*, complements and expands upon the information included in Marine Corps Doctrinal Publication 2, *Intelligence*, and Marine Corps Warfighting Publication 2-1, *Intelligence Operations*. This publication details doctrine, tactics, techniques, and procedures for conducting remote sensor operations and supporting Marine air-ground task force.

MCRP 2-10A.5 describes aspects of remote sensor operations, including, doctrinal fundamentals, command and control, communications and information systems support, planning, execution, and training. This publication provides information that Marines require to understand, plan, and execute remote sensor operations in support of the Marine air-ground task force and provides support information to intelligence personnel who are responsible for planning and executing remote sensor operations.

This publication supersedes MCRP 2-10A.5, *Remote Sensor Operations*, dated 17 July 1997; erratum, dated 24 June 1998; erratum, dated 13 July 2004; erratum, dated 2 May 2016; and change 1, dated 4 April 2018.

Reviewed and approved this date.



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CHAPTER 1.
REMOTE SENSOR FUNDAMENTALS

Remote sensors expand the commander's view of the battlefield. Remote sensors provide a means to economically conduct continuous surveillance of vast areas, contributing key information to the intelligence collection effort. These actions decrease the number of personnel required for reconnaissance and surveillance activities, while also reducing the risk associated with conducting them. Sensors, relays, and monitoring devices are employed in an integrated network, providing general surveillance, early warning, or target indication over selected areas of the battlefield. Key considerations in employing remote sensors are the nature of the target, characteristics of the area of operations, time, and resources available for emplacing the sensor network, and the location and connectivity of the sensor monitoring sites.

REMOTE SENSOR SYSTEMS

A remote sensor system is a continuous, all-weather surveillance system that monitors activity in selected areas. The system consists of sensors, retransmission devices, and monitoring equipment; system components are emplaced at selected points on the battlefield to provide an integrated sensor network. Sensors are placed adjacent to the desired surveillance area, usually a route or point target (objective, line of communication, helicopter landing zone, or assembly area). Individual sensors are activated by seismic, acoustic, magnetic, passive infrared, infrared, or electro-optical detections of moving targets.

According to Marine Corps Warfighting Publication (MCWP) 2-10, *Intelligence Operations*, remote ground sensors are considered a key measurement and signature intelligence (MASINT) capability organic to the Marine air-ground task force (MAGTF). Measurement and signature intelligence is information produced by quantitative and qualitative analysis of physical attributes of targets and events to detect, characterize, locate, and identify targets and events; it is derived from specialized, technically derived measurements and signatures of physical phenomenon intrinsic to an object or event. Although the primary tactical application of these devices is to collect data, which is generally provided directly to operations centers for immediate decision making, the data collected can also provide significant intelligence information on enemy or adversary movements and activities.

A common application for remote sensors is immediate intelligence production, such as to support the common tactical picture. Of the two types of intelligence production, deliberate and immediate, immediate production is a time-limited, highly focused effort that satisfies an immediate tactical requirement. This type of production involves rapid processing, analysis, production, and dissemination of intelligence to influence tactical decision-making (see Marine Corps Tactical Publication [MCTP] 2-10B, *MAGTF Intelligence Production and Analysis*).

Sensors transmit detection data by very high frequency (VHF) line-of-sight radio link directly via transmission devices or via satellite communications (SATCOM) to the monitoring equipment. Operators at the monitoring site interpret the detections to determine location, direction, and speed of movement of the detected targets. They may also be able to provide an estimated number of vehicles or personnel detected and a general identification of the type of targets detected (e.g., tracked vehicles, wheeled vehicles, or personnel), depending upon the type of sensors employed and the nature of the target's activity. This information is forwarded to intelligence, operations, and fire support agencies in the form of sensor reports (SENREPs).

REMOTE SENSOR EMPLOYMENT PRINCIPLES

Remote Sensor Employment

Remote sensors can be employed in support of multiple tactical activities. Optimal placement is in areas where major movement is restricted to a few key lines of communications and the traffic pattern of military and civilian activity can be easily discriminated. Remote sensor operations are ideally suited to support relatively stable situations such as long-term defensive or security operations ashore, where the time and resources are available to develop an extensive sensor network throughout the area of operations. Remote sensors have limited utility in fast-moving, limited-duration, mobile operations unless adequate time is provided to emplace sensors prior to beginning the planned operation. Employing sensors in open terrain or heavily congested urban concentration requires detailed planning to ensure the sensor network can provide the desired information.

General Surveillance. Surveillance is "the systematic observation of aerospace, surface, or subsurface areas, places, persons, or things, by visual, aural, electromagnetic, photographic, or other means" (*Department of Defense Dictionary of Military and Associated Terms*, hereafter referred to as *DoD Dictionary*). Surveillance involves observing an area, known threats, and local populace to collect information. Sensors are used to provide passive and continuous general surveillance of lines of communications, beachheads, helicopter landing zones, assembly areas, objectives, and other named areas of interest (NAIs) and targeted areas of interest. Sensor information is used to develop the general enemy situation and support the scheme of maneuver through the detection of enemy activity near insertion points or other objectives. These activities are considered surveillance missions and are not associated with the surveillance task performed as part of a reconnaissance mission. During surveillance, sensors observe the same area, waiting for information to emerge when an entity or its signature appears.

Early Warning. Sensors are placed along avenues of approach to provide early warning of indicators and enemy movement toward friendly positions. Sensor strings may be placed forward, on the flanks, or in the rear of friendly units to facilitate force protection. In this application, sensors should be placed as far forward of friendly positions as possible, exploiting the extended range of the remote sensor system to provide maximum reaction time.

Target Acquisition. A well-developed sensor network can be used for target acquisition. Remote sensors are suitable for the initial detection of emerging potential threats that begins the execution of the dynamic targeting cycle. Sensors are implanted along key enemy lines of communications

or NAIs and sensor activations are used to initiate targeting action. Possible targets to be detected include mobile, land-based targets that are planned, on-call, and time sensitive in nature (Joint Publication [JP] 3-60, *Joint Targeting*).

Sensors do provide an excellent means of facilitating the targeting process by cueing other target acquisition sources, and, once a target is positively identified, a well-planned sensor network can track a target as it moves across the battlefield. If used for target acquisition, care must be taken not to compromise the location of sensor strings through repeated attacks on enemy forces located in the same area. Employing remote sensors for target acquisition requires integration with the fires and targeting cell during planning and the decide phase of the decide, detect, deliver, and assess activities.

Remote Sensor Capabilities

Remote Surveillance. Remote sensors provide an extended-range surveillance capability without the requirement to maintain a physical presence in the surveillance area. Using retransmission devices to maintain radio line of sight communications connectivity or SATCOM between the sensors and the monitoring site, Marines can monitor the surveillance area at great distances. This capability gives the MAGTF commander a means to economically monitor activity in the area of operations or area of interest (AOI), conserving the use of other reconnaissance and surveillance assets for other critical tasks.

Target Detection and Classification. Sensors can confirm or deny the presence of activity in the designated area and give a general indication of the type and volume of activity. Sensors can provide the number, general type, location, direction, and speed of most acquired targets. The degree of detail and accuracy of the target classification is a function of the number and type of sensors used as well as the proficiency of the monitoring site operator. While sensor data alone is rarely sufficient for target acquisition, sensors can be used to cue other surveillance and target acquisition assets to obtain the data required for targeting.

Near Real-Time Reporting. Electromagnetic transmission of sensor detections to the monitoring site provides near real-time reporting of activity in the surveillance area. Automated processing equipment can generate a sensor report for transmission within seconds to minutes of an activation.

Continuous Operations. Sensors can operate for 30-45 days depending on attached devices with built in power, and up to 9 months using an external battery box. The retransmission devices can operate for 30 days with internal batteries, and up to 9 months with the external battery box.

Target Indication. A well-developed sensor network can be used to indicate possible targets. Sensors are implanted along key enemy lines of communications or NAIs and sensor activations are used to initiate targeting action. The key limitation of sensors in this application is the inability to discriminate among hostile, friendly, and noncombatant activity. As a result, sensor data must usually be confirmed by some other surveillance asset.

Stealth. Through the employment of camouflage and concealment, properly emplaced remote sensors are extremely difficult to detect. Built-in electromagnetic countermeasures also make electromagnetic detection and counter measures against remote sensors unlikely. To enhance system security, individual sensors contain an alarm circuit which notifies the monitoring station if the sensor is tampered with.

Flexibility. Remote sensors can be employed in various means to support the concept of operations. Sensors can be hand emplaced by mobile or foot patrols or dropped from aircraft. Detections can be relayed and processed in real time, near real-time, or stored by relays for transmission on command.

Limitations of Remote Sensors

Emplacement. The time and resources required to emplace sensors and relays are the key limitations on remote sensor operations. Sensors and relay placements must be planned in detail and accomplished well in advance of when the information is needed. The tactical situation may preclude certain platforms for use in implant activities and limit the number of ground patrols that can be employed for implanting sensors.

Terrain Masking. Unless using SATCOM, remote sensors require radio frequency line of sight between sensors and the monitoring site; as a result, they are susceptible to terrain masking. Effective employment requires detailed planning of sensor, relay, and monitoring site locations and knowledge of the capabilities and limitations of the transmitters. Terrain masking can preclude extended range employment of sensors in mountainous areas.

Limited Target Discrimination. Remote sensors by themselves cannot provide positive target identification. Sensors activate in response to some type of physical presence. Using a mix of sensor types can provide a general category of the target (e.g., personnel, wheeled vehicles, or tracked vehicles), but sensors cannot determine whether the target is friendly, enemy, or non-combatant. Sensor activations must be combined with other information to provide a positive target identification.

Responsiveness. Remote sensors are generally not responsive to changing requirements because of the time required to plan and execute implant activities. The best means of anticipating future sensor requirements and planning sensor support is through detailed study of mission, enemy, area of operations and commander's intent.

Sensor Positioning. Accurate sensor positioning is crucial to obtaining coverage of the desired area. Knowing the exact location of the implanted sensor is critical to successful relay and monitoring activities. As a result, sensors must be planted according to a plan and the location of the implants must be accurately reported to the monitoring agency. Inventory sensor assets are limited. The I and II Marine expeditionary forces (MEFs) have sufficient sensors for emplacing approximately 225 sensor strings of 3 to 4 sensors each, while III MEF has enough sensors for approximately 150 sensor strings of 3 to 4. Furthermore, while expendable, sensors are expensive and only a small war reserve stock is planned.

Failure Rate. Inherent in all electromagnetic systems is the potential for component failure. Loss of any single electronic component can render the device inoperable and degrade the operation of the overall system.

CONCEPT OF EMPLOYMENT

The ground sensor platoons' (GSPs') main objective is to provide an analysis, production, and dissemination capability that gives the company commander situational awareness of the battlespace. Developing accurate situational awareness with limited and uncertain information under severe time constraints is the fundamental challenge of information management. Some level of situational awareness can be achieved by analyzing raw data; however, an intelligence cell can reduce information ambiguity through more complete analysis, thus providing greater situational awareness. Enhanced situational awareness enables the company commander to assess situations more accurately and visualize future conditions and operations more effectively.

The GSP executes current operations and post-mission actions in support of the company commander. Current operations include the mission pre-brief, collections planning, intelligence function support, and, as required, mission field support (e.g., participating in patrols to gather intelligence or conducting site exploitations within means and capability). Post-mission actions include conducting mission de-briefs, updating the intelligence preparation of the battlespace (IPB) and collections plans, submitting reports to higher headquarters, and adjusting target packages.

GROUND SENSOR PLATOON ORGANIZATION, ROLES, AND RESPONSIBILITIES

Command and Control

Control. The GSP or GSP detachment centrally controls and maintains remote sensor assets and associated equipment, plans remote sensor employment, assists in hand implant activities, and monitors and reports information generated by sensor activations. Operational control of remote sensor operations is exercised by the MAGTF command through the surveillance and reconnaissance coordination cell (SARCC). The command element directs GSP employment through the support relationships as discussed in the following paragraphs.

General Support. Because of the scope of sensor operations and the need to integrate sensor information with other deep surveillance assets, GSP typically operates in general support of the MAGTF. In general support, the MAGTF commander, through the G-2/S-2, determines priority of support, locations of sensor strings and monitoring sites, and information dissemination flow.

Direct Support. The entire platoon or portions of it may be placed in direct support of a designated unit. Under direct support, priority of support goes to the unit's requirements. A GSP liaison element is provided to the supported unit. A monitoring site is collocated with the command post of the supported unit, or the unit receives sensor information directly from a designated monitoring site.

Mission

The mission of GSP is to provide MASINT support to the MEFs, in the form of SETs, that employ unattended ground sensors, in semi-permissive environments. The platoon plans, operates, advises, trains, and maintains the MEFs on ground sensors.

Tasks

The GSP performs the following tasks:

- Plans employment of remote-sensor systems in support of MAGTF operations.
- Conducts remote-sensor monitoring activities.
- Maintains remote sensor equipment.
- Trains personnel to emplace remote sensors and data relays.
- Assists in the planning and execution of sensor-emplacement missions.
- Provides liaison teams to the MAGTF command element and units designated to receive direct support from the remote-sensor system.

Organization

There is one GSP per MEF. A GSP consists of a headquarters section and three sensor employment squads (SESs). Each SES consists of a squad headquarters and three sensor employment teams (SETs). Each SET operates one tactical remote sensor system (TRSS) suite of equipment. Each can deploy nine SETs and nine full TRSS suites.

Headquarters Section. The headquarters section consists of the headquarters group (platoon commander and platoon sergeant), planning section, and administrative section. The headquarters section performs the following functions:

- Plans remote-sensor operations for the MAGTF as a whole.
- Manages execution of the sensor surveillance plan.
- Provides liaison element to command element or senior supported headquarters.
- Performs second- through the fourth echelon maintenance on remote sensor equipment.
- Provides supply support for the platoon.
- Training management.
- Embarkation.
- Platoon administration.

Sensor Employment Team. The SET is the basic unit of employment for remote sensor operations. A SET is made up of four Marines and operates one TRSS suite of equipment. A SET is designed to support a MEU-sized MAGTF. A SET can provide the following capabilities:

- Develop a limited-scope sensor surveillance plan.
- Help plan and execute implant activities.
- Provide sensors and relays for employing up to 24 hand-emplaced sensor strings.
- Operate a single-monitoring site on a continuous basis.

- Operate a remote-monitoring site for limited periods.
- Perform first echelon maintenance on remote sensor equipment.

Sensor Employment Section. An SES consists of three SETs. The squad headquarters provides an enhanced planning and liaison capability over that of the SET. In addition, it provides greater flexibility in establishing of remote monitoring sites.

Concept of Employment

A SET is task-organized to provide remote sensor support. While a SET or SES is configured to support a notional MEU or larger MAGTF, the specifics of the situation will determine the configuration of the sensor assets employed. The SET is the basic unit of remote-sensor employment. It is also the smallest element capable of independent employment. A SET is configured to support a MEU-sized MAGTF. A SES is designed to support a MEF (forward). A MEF is usually supported by an entire GSP.

Support Relationships. During tactical activities, the GSP or GSP detachments remain under OPCON of the MAGTF commander, normally in general support of the entire force. The MAGTF G-2/S-2 exercises OPCON for the MATGF commander through the SARCC.

The entire platoon, detachment, or portions of them could be placed in direct support of a subordinate unit. The SESs and SETs are configured for the direct support role.

Planning

Sensor activities are planned to satisfy the intelligence collection requirements of the supported command. The IPB process provides the key elements to support remote sensor operations planning, identifying of entry points, lines of communications, and threat avenues of approach; designating NAIs; and evaluating of communications line-of-sight conditions in the area of operations. The IPB data is analyzed to determine the optimal locations of sensor strings, relays, and monitoring sites. Requirements for implant activities are developed along with concepts for the monitoring and dissemination of sensor data. These elements are combined into a sensor surveillance plan.

Emplace Activities

Emplacement activities are tasked, coordinated, and controlled by the SARCC or equivalent collection management and tasking authority of the directly supported unit. Emplacement activities are planned jointly by the GSP and the designated implant unit.

Hand-Implant Activities. Hand-implant activities offer the following advantages:

- Greater accuracy of sensor placement.
- Ability to employ full sensor suite (air-droppable sensors are limited to seismic detectors).
- Flexibility to adapt implant plan to conditions in the surveillance area.

Sensors can be emplaced by any trained element. As sensors are designed for employment far forward of friendly positions (deep in the area of influence or in the AOI), hand-implant activities are optimally accomplished by reconnaissance units. Ground sensor platoon personnel provide training in implanting sensors and brief units tasked with implant missions.

Ground sensor platoon personnel are not organized, trained, or equipped to operate or undertake implant missions in deep or distant reconnaissance areas. However, a remote sensor operator should accompany any patrol tasked with a sensor-implant mission to ensure correct sensor emplacement and functioning. Because of the importance of proper relay siting and testing, a remote sensor operator should be included in any patrol assigned to implant a ground retransmission device. Ground sensor platoon personnel may carry out emplacement missions when access to the implant area does not require unique reconnaissance skills or security measures beyond the platoon's organic capabilities; due to the limited number of remote sensor operators, the use of personnel to carry out sensor emplacement may detract from ongoing sensor planning and monitoring activity.

Monitoring Activities

Processing Sensor Data. The GSP monitors sensor activations received by the Tactical Remote Sensor System (TRSS) in accordance with the sensor surveillance plan. The monitoring equipment provides real-time, on-screen monitoring of sensor activations, data storage, and automated assistance in the analysis of sensor data generation of sensor reports.

Monitoring Sites. A monitoring site consists of sensor monitoring equipment, communications equipment, and one or more sensor operators. A portable workstation can be remoted from each primary monitoring site to provide limited, standalone monitoring capability at remote locations. Monitoring sites are chosen to maintain communications line-of-sight with sensors or relays. Every effort is made to position monitoring sites in proximity to supported unit command posts to facilitate rapid reporting of sensor-derived information.

Dissemination of Sensor Information

The GSP disseminates sensor-derived information in accordance with the intelligence dissemination plan via area networks, sensor reporting radio net, or reconnaissance radio net. In general support, these reports go to the SARCC for further dissemination throughout the force. In direct support, reports go directly to the supported unit as designated by that unit's G-2/S-2. However, any unit can enter the sensor reporting net to receive sensor reports.

CHAPTER 2.
TACTICAL REMOTE SENSOR SYSTEM

A remote sensor system consists of sensors, communications data-relay devices, and monitoring equipment (see Figure 2-1). The current Marine Corps remote sensor system, or TRSS, provides the capability to establish an integrated sensor network in support of the MAGTF intelligence collection plan. TRSS equipment includes various hand-emplaced sensors, ground relays, and portable and mobile monitoring devices.

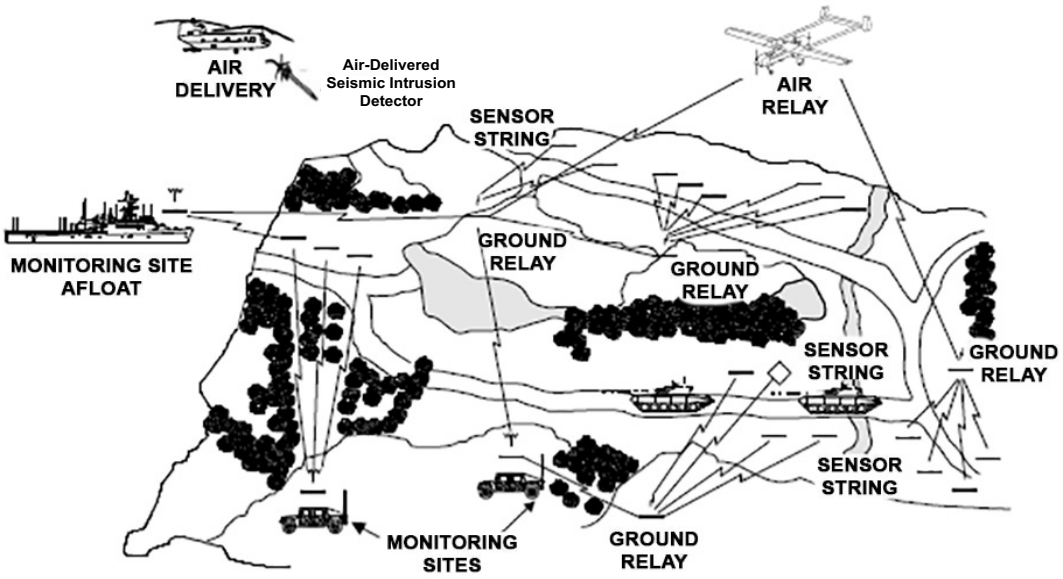

Figure 2-1. An Integrated Sensor Network Example.

TACTICAL REMOTE SENSOR SYSTEM EQUIPMENT SUITE

A TRSS is made up of—

- Sensors.
- Communications data-relay devices.
- Monitoring equipment.
- External power sources.

One complete TRSS suite, which comprises the equipment listed in Table 2-1, has sufficient equipment to create and monitor 25 hand-emplaced sensor strings, and is intended to support a Marine expeditionary unit (MEU). Each MEU operates six TRSS suites.

Table 2-1. Tactical Remote Sensor System Equipment Suite.

Equipment	Distance (in meters)
Seismic/Acoustic transducer assembly	100
IRID-II	50
MagID-II	50
ETU-II	100

SENSORS

A sensor consists of a detection device, an encoder transmitter unit version II (ETU-II), an antenna, cabling, and associated connectors. Sensors detect changes in the physical environment through various means. When activated by a target, the sensor sends an electromagnetic impulse to the ETU-II. The impulse is encoded and transmitted to a relay or monitoring site via VHF radio or SATCOM signal.

Detection devices are placed within detection range of the target area, either on or in the round, depending on the type of detector. With hand-emplaced sensors, the detector is attached to the ETU-II by means of a cable and the encoder transmitter is buried in the ground or concealed in vegetation with its antenna extended.

Detector Types

Seismic. The ETU-II is the basic seismic and acoustic detector. The ETU-II is equipped with a seismic geophone which enhances detection of ground vibrations caused when personnel or vehicles pass within the geophone's detection range. The seismic/acoustic transducer assemblies have a detection radius of .5-10 meters for personnel and 2.5-50 meters for vehicles. The detection radius varies with soil type; the sensor's sensitivity can be adjusted to suit specific environmental conditions.

Magnetic. Magnetic sensors are confirming sensors, primarily used to detect the presence of vehicles or distinguish between vehicles and personnel. They detect disturbances in a self-generated magnetic field caused by the presence of ferrous metals. They can also determine direction of movement across their magnetic fields (i.e., left-to-right, or right-to-left). Magnetic detectors have a limited radius: 1-5 meters for personnel and 3-30 meters for vehicles.

Infrared. Infrared sensors are another type of confirming sensor; they are particularly useful for counting the number of objects (personnel or vehicles) moving through a sensor string. Infrared sensors use a passive infrared detector to sense changes in ambient temperature caused by an object moving through its field of view. Infrared detectors can also determine direction of

movement across their field of vision. Infrared detectors have a unidirectional detection range of 20 meters for personnel and 50 meters for vehicles. Infrared detectors must be above ground with their sensor head situated to provide an unobstructed field of view to the surveillance area.

Encoder Transmitter Units-Version II

The ETU-IIs contain the logic, circuitry, and power source necessary for transmitting data captured by the detector. A common ETU-II is used with all types of hand-emplaced detectors; it can be attached to each ETU-II and one detector (infrared intrusion detector-version II [IRID-II] or magnetic intrusion detector-version II [MagID-II]) that can be attached to each ETU-II in addition to the geophone transducer. The ETU-IIs transmit using one of 599 available VHF radio channels; the channel is selected prior to implant and cannot be changed without recovering the ETU-II. In addition to detections, ETU-IIs transmit periodic messages to confirm proper operating status and a specially coded message to indicate when a sensor has been tampered with. The ETUs are powered by standard 9-volt lithium or alkaline batteries. Battery power is sufficient for 30 days of continuous operation; because the battery is used primarily to transmit sensor activations, battery life may be extended significantly if sensor detections are limited.

RELAYS

Relays provide line-of-sight communications connectivity between sensors and monitoring sites, extending the range of the TRSS and permitting its use in restricted terrain. Relays consist of a receiver or transmitter, control circuitry, power source, and antenna. The relay can be programmed to relay incoming data in real time or store the data until remotely commanded to transmit the data to an available monitoring site. Relay is accomplished via VHF, ultrahigh frequency radio link or SATCOM; ultrahigh frequency is used to transmit stored data at a faster data rate. Relay functions such as channel selection and operating mode can be controlled remotely via VHF link from the monitoring site. Relays are hand-emplaced; the relay and power source is concealed on or under the ground with only the antenna extending from the camouflaged relay equipment. A single battery pack provides 30 days of continuous operation; additional battery boxes can be connected to provide extended operational periods.

IMAGERS

Imagers receive activations from ETU-IIs and produce either a thermal, monochrome, or colored image of the target. Any type of sensor can be used, however magnetic identifications (MAGIDs) and infrared imaging and detection systems (IRIDS) are the preferred imagers because they can isolate a specific avenue. There are four camera options available within the Imager-II: short range electro-optical, short-range infrared, long range electro-optical, and long-range infrared.

Short Range Electro-Optical

The short range electro-optical camera can take colored pictures of personnel out to 150 meters and vehicles out to 500 meters. It is primarily used during the day, as it relies on outside light sources.

Short Range Infrared

The short-range infrared camera can also take pictures of personnel out to 150 meters and vehicles out to 500 meters. It is primarily used during the night, as it uses infrared light to capture images.

Long Range Electro-Optical

The long range electro-optical camera can take colored pictures of personnel out to 450 meters and vehicles out to 1,000 meters. It is primarily used during the day due to reliance on outside light sources.

Long Range Infrared

The long-range infrared camera can take pictures of personnel and vehicles out to 1,000 meters. It is primarily used during the night, as it uses infrared light to capture images.

MONITORING EQUIPMENT

Monitoring equipment receives data from sensors and relays, processes the data to derive the maximum amount of information and generates an automated sensor report. Sensor operators verify the reports and disseminate them to the appropriate agency. The TRSS uses two types of monitoring equipment: the sensor monitoring group (SMG) and the hand-held programmer monitor. Both can receive, decode, and display sensor data from the US Army Improved Remotely Monitored Battlefield Sensor System and the Miniature Intrusion Detection System.

Sensor Monitoring Group

The SMG provides equipment for receiving, storing, processing, displaying, and reporting remote-sensor activity. The sensor mobile monitoring system is a self-contained system of monitoring, processing, and communications equipment with in the SMG. A system has two workstations, each of which can monitor up to 504 sensors. Either one of the monitoring workstations can be displaced from the shelter to provide limited, standalone monitoring capability at remote locations.

Hand-Held Programmer Monitor

The hand-held program monitor is a unit that receives, decodes, and displays sensor identification code transmissions. It is primarily used to conduct field operational checks at the sensor implant site. It can be used to monitor sensor activations on a limited basis, but all data received by the portable monitor must be processed manually.

CHAPTER 3.
COMMAND AND CONTROL
REMOTE-SENSOR OPERATIONS

COMMAND AND CONTROL

Marine Corps remote-sensor assets are assigned and employed under the centralized control of the GSP. The GSP is responsible for planning and executing remote-sensor activities in support of MAGTF operations.

Command

The GSP is commanded by the GSP platoon commander, whose authority and responsibilities are similar to those of other commanders.

Operational Control

Operational control (OPCON) of GSP rests with the MAGTF commander. The MAGTF commander exercises OPCON through the G-2/S-2 and the SARCC OPCON includes the authority to plan and execute remote-sensor operations, assign a tactical. mission to the platoon, and designate support relationships.

Administrative Control

Administrative control (ADCON) is exercised through the administrative chain of command. Currently, the intelligence company exercises ADCON over the GSP and is responsible for training, equipping, and ensuring the required order, discipline, maintenance, and sustainment of the platoon.

Attachment

Temporary command relationships, such as the attachment of the platoon or detachments from the platoon to MAGTFs smaller than a MEF or major subordinate commands form depending on the tactical situation. In an attachment, the command assumes full command (OPCON and ADCON) responsibility for the attached element.

Attachment of GSP sub elements typically provide remote-sensor capability to deploying MAGTFs smaller than a MEF. When the entire MEF deploys general and direct relationships allow the GSP to tailor remote sensor support.

Detachments should be built around standing elements (SESs and SETs). When attaching a GSP detachment to a standing MAGTF (e.g., a MEU), which will be a recurring evolution, make every effort to establish a habitual relationship between that MAGTF and the detachment's base SES or SET.

Support Relationships

Factors Influencing Support Relationships. No single mode of support is appropriate to all situations. Key considerations in determining the appropriate support relationship are as follows:

- Concept of operations.
- Remote sensor application being employed.
- Depth of the sensor network forward of friendly lines.
- Requirement for timeliness of sensor information.

As the most common use of remote sensors is to provide general support of the AOI and because sensor information must normally be combined with other intelligence to gain full benefit of this information, general support is the preferred support relationship. The use of direct support could be appropriate in the following circumstances:

- To support a unit designated as the main effort for a particular operation or phase of an operation.
- When conducting independent or geographically separated operations by a subordinate element.
- To provide early warning of enemy activity to the unit(s) responsible for that sector of the area of operations.
- To provide target acquisition support to fire support agencies responsible for that sector of the area of operations.

Responsibilities under general support and direct support are shown in Table 3-1.

Table 3-1. Responsibilities Under General Support and Direct Support.

Responsibility	General Support	Direct Support
Establishes liaison	GSP liaison and control element with SARCC or MAGTF G-2/S-2*	Liaison team with supported unit G-2/S-2
Develops sensor surveillance plan	SARCC	Supported unit G-2/S-2 or SARCC**
Directs sensor emplacement missions	SARCC	Supported unit G-2/S-2 or SARCC**
Positions monitoring sites	GSP commander in coordination with SARCC	GSP commander in coordination with supported unit
Determines sensor data flow	MAGTF G-2/S-2 or SARCC	Supported unit G-2/S-2
Provides administration and logistics support responsibility	Commander with ADCON	Commander with ADCON
NOTE *When no SARCC is established, MAGTF G-2/S-2 performs SARCC functions. **The SARCC or supported unit G-2/S-2 may perform these functions depending on the tasking authority given to the supported unit.		

TASKING REMOTE-SENSOR ASSETS

Tasking Authority

Tasking authority for remote-sensor assets rests with the commander who exercises OPCON over the GSP or GSP detachment. Tasking authority includes directing the—

- Emplacement of sensor and relays.
- Establishment of monitoring sites.
- Dissemination of sensor information.

Under direct support, the supported commander may be given complete or partial tasking authority over the supporting remote-sensor assets. For example, a unit with a detachment in direct support can be given authority to position monitoring sites and direct the dissemination of sensor data, but not be authorized to emplace new sensors. In establishing the support relationships, the MAGTF commander must designate the degree of tasking authority delegated to the supported commander.

Exercise of Tasking Authority

Tasking authority is typically exercised by the SARCC, based upon commander's guidance, direction from the G-2, the intelligence collection plan, and the concept of operations. Most remote-sensor tasks are assigned by the sensor surveillance plan. Modifications to the plan or new taskings are given to the GSP in the form of fragmentary orders, usually via a GSP liaison and control element located in the SARCC.

Requesting Remote-Sensor Support

Remote-sensor support is requested through the operational chain-of-command, using established intelligence collection support procedures.

Subordinate units usually identify general intelligence collection requirements rather than ask specifically for remote-sensor support. This permits the MAGTF collections officer to determine the best asset to satisfy the requirement; the best asset might be an unmanned aerial vehicle or a recon team but not remote sensors.

In certain circumstances, it might be appropriate for a subordinate unit to specifically request remote-sensor support. In asking specifically for remote-sensor support, a subordinate unit can request that sensor surveillance be established in a particular location(s), a GSP detachment be placed in direct support, or that sensor reporting be provided through a specific communications link. For example, the ground combat element (GCE) may want to incorporate sensors in support of its covering force during defensive operations; in this case, the GCE should request a GSP detachment be placed in direct support, with authority to emplace its own sensor network.

Any type of remote-sensor support request should be coordinated between the collections section of the MAGTF and the requesting unit.

REMOTE-SENSOR CONTROL AGENCIES

The following agencies are usually established to exercise control over remote-sensor operations.

SARCC

The SARCC serves as the focal point for the planning and execution of intelligence collection activities within the MAGTF. The SARCC exercises operational control for the MAGTF commander over remote-sensor assets. The SARCC develops the sensor surveillance plan, supervises the execution of the plan, develops and issues new remote-sensor taskings, and maintains the current status of the established sensor network and remaining remote-sensor assets. When no SARCC is established, the G-2/S-2 section of the supported unit carries out these functions.

Liaison and Control Element

The GSP provides a liaison and control element to the SARCC. This element, headed by the platoon or detachment commander, performs the following functions:

- Plans remote-sensor operations.
- Exercises command and control of GSP elements.
- Maintains status of remote-sensor assets.
- Receives sensor reports from monitoring sites.

Headquarters

The platoon or detachment headquarters provides administrative and logistical support to remote sensor operations. A GSP command post is typically established in proximity to the SARCC.

Monitoring Sites

Monitoring sites maintain the status of and provide reporting from their assigned portions of the sensor network. A senior monitoring site can be designated to coordinate the activities of all the monitoring sites; otherwise, this function is carried out by the GSP liaison and control element of the SARCC.

Liaison Teams

Liaison teams are provided to units assigned implant missions and to units receiving direct support from a GSP element. Responsibilities for liaison teams to implant agencies are listed in Chapter 5. Responsibilities of liaison teams for supported units parallel those of the GSP liaison and control element of the SARCC.

COMMUNICATIONS FOR REMOTE-SENSOR OPERATIONS

The success of remote-sensor operations depends upon the maintenance of effective command and control of monitoring activities and the timely dissemination of sensor data. Detailed planning is required to ensure that the necessary communications architecture is established to support remote sensor operations.

Sensor Data Transmission

Sensor data from the encoder transmitter units and relays is transmitted in a unique frequency band; no other US military equipment uses this frequency band. Therefore, there is no requirement to establish a unique "sensor data transmission" net. However, the GSP must still request allocation and coordinate the use of frequencies and channels for sensor data transmission with the communications officer in accordance with established procedures for use of electromagnetic emitters.

Sensor Reporting

The timeliness requirement for sensor reporting dictates the means used to disseminate sensor reports. The following dissemination options are available:

- Direct Dissemination. Whenever possible, a monitoring site should be collocated with the SARCC or command post of the supported unit. A monitoring site in proximity to the supported unit can directly disseminate sensor reports via messenger, telephone, or local area network.
- Radio or SATCOM. Transmitting sensor reports via radio nets or SATCOM may be the only way to disseminate sensor information in a timely manner, particularly when monitoring sites are dispersed throughout the area of operations.

If a high volume of time-sensitive reporting is anticipated, a sensor reporting net should be established; otherwise, time-sensitive reports can be sent over the supported unit's intelligence or reconnaissance net while non-time-sensitive reports can be disseminated via messenger or other means. The supported unit's intelligence or alert (broadcast) net should be used to transmit critical early-warning or target acquisition reports. Data transmission should be used whenever possible to minimize transmission time and ensure accuracy of the reporting.

Command and Control

The GSP or GSP detachment commander must maintain effective command and control over the subordinate elements. While this can sometimes be accomplished by using the communications assets of the supported unit(s), positive control typically requires a separate GSP command net be established.

Radio Nets

The following unique radio nets may be required to conduct remote sensor operations:

- Sensor Reporting Net:
  - Purpose. Provides a means for rapid reporting of sensor data to supported units. This net operates in a broadcast mode whenever possible; any unit with the capability can enter the net to copy pertinent sensor reports.
  - Composition. This net consists of the following:
    - SARCC (net control).
    - Monitoring sites.
    - Supported units.

- Command Net:
  - Purpose. Provides means for GSP commanders to exercise command, monitor status of remote-sensor activities, and coordinate administrative and logistics requests of subordinate elements.
  - Composition: This net consists of the following:
    - SARCC (GSP liaison and control element).
    - Platoon or detachment headquarters (net control).
    - Monitoring sites or deployed SES and SETs liaison teams.

CHAPTER 4.
PLANNING FOR
REMOTE-SENSOR OPERATIONS

Conducting remote-sensor operations requires detailed planning and key intelligence developed through the IPB process. The mission, area of operations, threat, commander's intent, and concept of operations must be analyzed to determine the potential for remote-sensor employment and which sensor information requirements must be satisfied. To develop a sensor surveillance plan, a sensor employment planning cell headed by the intelligence collections officer uses a six-step sensor employment planning cycle. The sensor surveillance plan provides the employment concept and detailed instructions for the execution of remote-sensor operations. Requirements for implant activities are developed along with concepts for the monitoring and dissemination of sensor data and these elements are combined into the sensor surveillance plan.

EMPLOYMENT CONSIDERATIONS

Detailed Planning

Detailed planning is essential to effective remote-sensors employment. The time and resources necessary to emplace a comprehensive sensor network requires a focused planning effort. Employment of remote sensors must be linked to both the anticipated enemy activity (as indicated by the results of IPB analysis) and the concept of operations.

Precise Sensor and Relay Emplacement

Precise emplacement of sensors and relays is crucial to ensure that sensor surveillance is established at the proper locations and that communications line-of-sight is maintained between the sensors and the monitoring sites. Detailed coordination between the sensor planning agency and the units conducting implant activities facilitates proper execution of the sensor surveillance plan.

Comprehensive Monitoring Regime

A comprehensive monitoring regime must be established to ensure receipt, processing, and reporting of sensor data. The sensor monitoring plan should ensure data is received in time to impact the planning or decision-making process. The plan must attempt to establish redundancy in the monitoring system to ensure no data is lost as a result of displacements, equipment failure, or enemy action.

Effective Analysis of Sensor Data

Sensor activations alone provide minimal information. It is the analysis of activations from strings of mixed types of sensors that yields detailed and useful intelligence information. Skilled sensor operators can provide not only activation times and locations, but estimated number of personnel or vehicles, vehicle classifications, as well as speed and direction of movement.

Integrating Sensor Data with Other Intelligence

While sensor data may provide important information concerning enemy activity, sensors alone rarely disclose the full nature of the activity or enemy intentions. However, the value of sensor data significantly increases when combined with other intelligence information. In particular, sensor activations can be used to focus other intelligence collection assets on an area or activity of interest. The use of sensors should be based upon detailed IPB analysis and fully integrated with the overall collection plan to provide surveillance of NAIs and cue other collection assets.

SUPPORT TO OPERATIONS

The nature of the mission determines the tactical application and scope of remote-sensor operations. For each type of mission, there are unique considerations for the employment of remote sensors.

Offensive Operations

Offensive and amphibious operations are the most difficult to support with remote sensors. The rapid pace and fluid nature of modern offensive operations may result in emplaced sensor networks being quickly uncovered by enemy or adversary forces; sufficient time and resources may not be available to reestablish the network to support exploitation and pursuit. In addition, monitoring activities and the dissemination of sensor data are complicated by frequent displacements of advancing units. When a sensor network can be established in advance of the operation, remote sensors can provide the following support:

- Monitoring Objectives. Sensors can confirm or deny the presence of activity in an objective and avenue of approach, by detecting and classifying the nature of activity on and around the objective.
- Surveilling Entry Points. As with objectives, sensors can provide surveillance of beaches, helicopter landing zones, and drop zones to help determine their suitability.
- Surveilling the AOI. Sensors emplaced deep in the battle area can help guide the planning effort by characterizing the location, nature, and intensity of enemy activity in the area of operations. Once execution begins, the sensor network helps monitor enemy response to the attack, providing early warning of reinforcement or counterattacks, identifying retrograde operations, and assisting in target acquisition efforts.

Defensive Operations

The TRSS is well suited to support defensive operations. As in offensive operations, sensors provide the best support when they can be emplaced deep in the AOI. In the defense, sensors are implanted along likely avenues of approach and in and around probable assembly areas to provide early warning of enemy attacks. An extensive sensor

network can be used to track enemy formations as they move across the battlefield, providing basic targeting data and cueing other target acquisition assets. In a mobile defense, sensors can also be used to provide surveillance of gaps between units or of open flanks or rear areas.

Amphibious Operations

Employing remote sensors in support of amphibious operations presents many of the same challenges as supporting offensive operations, coupled with the following complications:

- Increased size of operating area and number of objectives, entry points, lines of communications, and NAIs to be covered.
- Limited access to the amphibious objective area for implant activities.
- Risk of compromising operations security (OPSEC) by emplacing sensors.
- Difficulty maintaining communications line of sight between sensors or relays and shipboard monitoring sites.
- Conducting shipboard monitoring activities due to limited bandwidth.
- Widely dispersed advanced naval bases during advanced base operations.

Other Operations

The TRSS can be used to support forces engaged in other operations, (e.g., disaster relief, humanitarian assistance, noncombatant evacuation). Generally, it is the nature of the threat, the characteristics of the area of operations and the duration of the operation rather than the mission that determine the applicability of remote sensor support to an operation. Missions which have a large area of operations and are conducted over an extensive period such as peacekeeping or support to counterinsurgency are more likely to benefit from TRSS employment. Conversely, the opportunity to emplace and develop an effective sensor network in support of short-duration, limited-scope activities like raids or recovery operations is minimal.

PLANNING CONSIDERATIONS

Terrain

Terrain factors have a significant impact on sensor employment. Primarily, the terrain determines potential sensor locations, implantation means, sensor detection radius, the requirement for relays, and the positioning of monitoring sites. Terrain factors to be considered are as follows:

- Soil Type and Composition. Hard, compacted soils offer best detection conditions for seismic sensors because they are least likely to block signal transmission.
- Ambient Interference. Seismic noise due to volcanic activity, earth tremors, surf action, or running water (either natural, e.g., rivers and streams, or man-made systems such as sewer or water supply systems) degrades the quality of seismic sensor performance. Emissions from power lines and other electromagnetic sources can disrupt magnetic sensors.
- Vegetation. Vegetation provides concealment for sensors and relays but may inhibit antenna placement and interfere with communications line of sight.

- Lines of Communications. The traffic pattern in the area of operations is a critical factor in determining the best sensor emplacement locations. In general, areas with limited lines of communications and restricted cross-country mobility provide the best sensor information. Choke points along lines of communications are particularly lucrative sensor targets.
- Waterways and Water Table. In addition to the ambient noise problem, the drainage pattern and water table must be analyzed to ensure potential sensor locations do not become inundated during operations.
- Communications Line of Sight. Unless airborne relays are employed, communications line of sight is a critical factor in sensor employment. The topography of the area must be analyzed to determine the feasibility of sensor employment and best positioning of sensors, relays, and monitoring sites.

Weather

While TRSS components are designed to operate in all weather conditions, extreme weather conditions can impact the system's performance. Adverse weather can—

- Cancel or delay implant activities.
- Displace antennas and above ground sensors or relays.
- Degrade sensor performance.

Threat

The nature of the threat can also affect the success of remote sensor operations. An enemy force made up of mechanized or motorized units with an established doctrine for movement and pattern of activity is much more susceptible to detection by the TRSS than a small, foot-mobile insurgent group. Detailed threat analysis must be used to determine whether sensors can be employed effectively against a given enemy and how to employ the TRSS to obtain the best possible sensor information. The enemy's ability to detect and interdict implant activities must also be considered. The potential for OPSEC compromise and loss of assets during emplacement activities must be balanced against the benefits to be gained from sensor employment.

Implant Activities

Establishing a comprehensive sensor network requires time and a significant investment of resources. In addition to the OPSEC concerns discussed above, reconnaissance and aviation assets must be available to conduct implant activities and there must be sufficient time to establish the network before sensor information is required.

SENSOR EMPLOYMENT PLANNING CYCLE

Employing remote sensors requires detailed planning and is a shared responsibility of the G-2 collections officer or ground reconnaissance and surveillance officer (usually the officer in charge of the SARCC, if one is assigned) and the GSP platoon commander or detachment commander. A six-step sensor employment planning cycle is used to plan remote-sensor operations. At the MAGTF level, a sensor employment planning cell might be established.

Determine Sensor Information Collection Requirements

The first step in the sensor employment planning cycle is to develop specific collection requirements for remote sensors. The intelligence collection officer—

- Analyzes the intelligence collection requirements, considering the sensor planning factors described above, commander's intent, and guidance from the G-2/S-2 to determine which requirements could be satisfied by remote-sensor employment.
- Breaks the general collection requirements down into specific sensor information collection requirements, which are then used to develop a rough task list for the GSP detachment. The intelligence collection officer also tries to establish priorities among the potential tasks.
- Considers the command and support relationships to be used, based on the commander's intent, ongoing operational planning, and the sensor information collection requirements. If placing all or part of the GSP detachment in direct support of a particular unit is appropriate, the intelligence collection officer provides this planning guidance to the sensor planning cell.
- Provides a detailed briefing for the sensor planning cell. The briefing should cover the—
  - Command mission.
  - Orientation to the area of operations.
  - Friendly and enemy situations.
  - Commander's intent and guidance.
  - Concept of operations or courses of action under consideration.
  - Intelligence collection requirements.
  - Collection strategy.
  - Sensor information collection requirements and GSP detachment tasks.
  - Priorities and risk assessment.

Conduct Sensor Employment IPB

Drawing heavily on IPB conducted by the supported unit's intelligence section, the planning cell analyzes the area of operations to determine environmental and threat factors affecting sensor employment. Key IPB products used in this analysis include soil analysis studies, lines-of-communications overlays, combined obstacle overlays, enemy situation templates, and line-of-sight profiles. When this process is completed, the planning cell will have a detailed understanding of the influence of terrain, weather, and enemy forces on sensor employment and will have identified potential locations for sensors, relays, and monitoring sites.

Determine Asset Availability

Using the results of the sensor employment IPB process, the planning cell next determines sensor asset availability and assesses whether the assets are sufficient to accomplish the assigned tasks. The availability of units to conduct implant missions must be considered along with the number of sensors, relays, and monitoring sites required.

Prepare Sensor Surveillance Plan

The key elements from the first three steps in the planning cycle are integrated to develop a draft sensor surveillance plan. These steps provide the sensor information collection requirements, potential TRSS element locations, and availability of sensor assets and implant agencies.

The sensor surveillance plan specifies the—

- Type and location of sensors, relays, and monitoring sites.
- Time of emplacement and unit responsible for emplacing each sensor string and relay.
- Frequency and channel assignment for each sensor and relay.
- Command and support relationships for GSP detachments.
- Conduct of monitoring activities.
- Sensor data dissemination flow.

The planning cell attempts to ensure that the plan will accomplish all assigned taskings within the constraints of available sensor assets, implant agencies, and time. When assets are insufficient to carry out the entire plan, the cell must make recommendations as to which locations offer the highest potential for collection of sensor data and prioritize among them. It must also conduct a risk assessment for each implant mission, attempting to determine the potential for compromise of the individual implant mission and the potential impact on OPSEC.

Other Actions

Other actions include completing the sensor surveillance plan and submitting it to the commander for decision or approval.

CHAPTER 5.
EXECUTING REMOTE-SENSOR OPERATIONS

Executing remote-sensor operations includes conducting emplacement activities, monitoring activities, and reporting and dissemination of sensor information. Each aspect must be carried out successfully to produce useful sensor information. Information produced from remote-sensor operations is combined with other intelligence to build a complete picture of the area of operations and the threat. Depending on the concept of operations, sensor information may be used to provide general surveillance, early warning, or limited target acquisition.

EMPLACEMENT ACTIVITIES

Emplacement Methods

Mounted Patrol. Mounted patrols can rapidly establish the sensor network over a wide area. Mounted patrols are subject to detection and interdiction by enemy defenses and are restricted to areas accessible by vehicle. Mounted patrols should be used to implant sensors whenever the terrain and threat permit the conduct of such patrols. Because of their speed, range, and self-defense capabilities, light armored reconnaissance battalions are primary sensor-implant units; however other units can implant if their skill sets are better suited to the mission.

Foot Patrol. Foot patrols provide a clandestine means to implant sensors forward of friendly lines. The key limitations on implantation by foot patrol are the time and assets required to establish the sensor network. A typical foot patrol can carry 2 or 3 sensor strings; it can take 24-72 hours to emplace those strings. Unless numerous patrols can be dedicated to implant activities, only a limited sensor network can be established in a short period of time. Foot patrols should be employed to emplace key sensor strings and relays when the terrain or threat precludes use of other implant methods. Because they are trained to operate at significant depths in front of friendly lines, ground reconnaissance units are the preferred agencies for these implant activities; however, any unit with the capability to conduct ground patrols can carry out this mission.

Implant Agency Selection Criteria. The following criteria should be used in determining the implant method—

- Implant location.
- Threat.
- Time available.
- Implant unit availability.
- Requirement for use of confirming sensor types.

Planning Emplacement Activities

Tasking. Sensor implant missions are assigned in the sensor surveillance plan. Implant requirements that arise subsequent to the publication of the sensor surveillance plan are developed by the SARCC or cognizant G-2/S-2 section and tasked via the appropriate operational chain of command. Coordination between the sensor planning cell and units tasked with implant missions should occur early in the planning process to ensure the feasibility of the implant tasking and the availability of assets to perform the implant missions.

Combining Sensor Implant Missions with Other Tasking. A sensor implant mission can be combined with other tasks during a single patrol or sortie; however, such dual tasking should be coordinated with the SARCC and everyone involved must understand and agree on the relative priorities of each task assigned.

Mission Planning. The unit tasked with the implant mission is responsible for planning the mission. A sensor implant mission is planned like any reconnaissance mission, with the focus of actions in the objective area on emplacing of the sensors or relays, while following the five phases of reconnaissance missions per Marine Corps Reference Publication (MCRP) 2-10A.6, *Ground Reconnaissance Operations*. Consideration must be given to the additional preparation time required to hand off sensor equipment, coordinate implant requirements, and provide instructions on sensor-emplacement techniques.

Liaison Responsibilities. The GSP or GSP detachment provides liaison element to the unit tasked with the sensor implant mission. The liaison element—

- Provides sensor equipment.
- Gives instructions on emplacing sensor equipment.
- Loads the proper settings into each sensor or ETU.
- Coordinates details of emplacement locations.
- Discusses alternate implant locations, equipment troubleshooting, abort criteria, and other operational contingencies.

If appropriate, and with prior coordination, member(s) of the GSP liaison element might participate in the implant mission. When the mission involves emplacement of a ground relay, a remote-sensor operator should accompany the patrol to ensure proper relay siting and testing. At a minimum, GSP personnel should observe a rehearsal of the actions in the implant area to ensure the unit can properly emplace the sensors or relays.

Execution of Implant Missions

Implant missions are conducted like any other tactical mission, with special consideration given to the actions in the objective area required to emplace the sensor equipment.

Actions in the Objective Area. The following actions are performed in the objective area:

- Confirm conditions in the implant area.
- Emplace sensor equipment in accordance with the mission tasking.
- Verify the location of the implant (preferably with Global Positioning System).

- Conduct operational checks of the equipment.
- Prepare a sensor tag and sketch diagram of the implant site.

Command and Control. Hand-implant missions are controlled by the SARCC or the unit operations section exercising control over that area of the battlefield. The GSP or GSP detachment should monitor the progress of ongoing implant missions, providing input to any modifications required during mission execution.

Post-Mission Activity. Upon completion of the implant mission, the unit debriefs, completes the sketch diagram, and prepares a sensor implant report. The sensor implant report will be forwarded to the SARCC and GSP detachment by the most expeditious means. The debrief report, sensor tag, and sketch diagram are delivered to the GSP detachment as soon as practical.

MONITORING ACTIVITIES

Monitoring Techniques

Near Real Time. Near real-time (NRT) monitoring is the receipt, processing, and analysis of sensor activations as they occur. It is the preferred monitoring technique, as it provides rapid reporting of sensor data, and is the only fully effective method to employ when sensors are used for early warning or target acquisition. Near real-time monitoring is accomplished by establishing a monitoring site with communications line-of-sight to the sensors and relays in its assigned area; this site provides continuous monitoring of its portion of the sensor network. The disadvantages of this technique include the need to maintain line-of-sight to all sensors and relays and the requirement to conduct non-interrupted activities.

Store and Exploit. Sensor relays have the capability to store sensor activation data for retrieval at a later time via interrogation by an airborne relay or ground monitoring, for example:

- When sensors are employed for general surveillance and speed of reporting is not critical.
- When the depth of the sensor network precludes NRT monitoring of all sensors or relays in the network.
- During monitoring site displacements.
- To recover data not collected during interruptions in NRT monitoring activities.

The principal drawback of this technique is the lack of timeliness of the data.

Fixed Site. Establishing a fixed monitoring site occupied by a sensor mobile monitoring system (SMMS) provides the most reliable means of monitoring sensor activations. The monitoring site must have communications line-of-site to the monitored sensors and relays. Every effort should be made to collocate or establish the site near the supported unit to facilitate reporting of sensor data.

Remote Site. One of the two receiver terminals in the mobile monitoring system can be displaced from the system to provide a remote monitoring site capability. This capability provides redundancy for monitoring activities and can be used to provide a direct feed of sensor data to

supported units when the requirement for timeliness of the data or lack of communications connectivity precludes providing support from the fixed site. The portable monitor can also be used to conduct remote site monitoring; however, but the portable monitor is limited in the number of sensors it can handle and all process must be conducted manually. The remote site must have communications line of sight to the sensors or relays. Additional monitoring personnel are required to conduct remote site activities over an extended period.

Mobile Monitoring. Sensors cannot be monitored while the monitoring site is moving. However, by employing the store- and- exploit method, it is possible to perform monitoring activities during short halts on the march. Communications line of sight must be established at each new monitoring position, and there must be sufficient time allotted to recover and process all stored sensor data. This technique is effective in supporting high-tempo mobile activities or in servicing a widely dispersed sensor network that cannot be monitored from established fixed site(s).

Shipboard Monitoring. It is possible to monitor sensor activations from offshore; however, shipboard monitoring activities require detailed planning and coordination. As with other monitoring techniques, the principal difficulty is maintaining communications line of sight. Unless the ship will be continuously positioned close to the coastline, the store-and-exploit method must be used. At periodic intervals, the ship can approach the coastline to establish line of sight, or an airborne relay can interrogate the sensor relays. Other complications in shipboard monitoring include the requirement to deck-mount antennas, coordinate of transmissions with shipboard emission control conditions, extensive electromagnetic interference, and the lack of spaces from which to conduct monitoring activities. Extensive coordination with the ship's activities and deck divisions are required to ensure proper ship positioning and the availability of effective locations for antennas and monitoring equipment.

Planning Monitoring Activities

Principles. Principles for planning monitoring activities include the following:

- Provide Monitoring and Dissemination of Data to Meet Requirements. The monitoring plan must ensure sensor data is collected, processed, and reported to satisfy the requirements set forth in the commander's guidance and collection plan. Particular attention must be paid to the timeliness of the data provided.
- Monitoring Activities. The monitoring plan must consider the location and activities of the supported units. Monitoring sites must be positioned where they can best collect sensor data and report that data to the supported units. Enemy activity may be anticipated at certain phases of the operation; monitoring personnel must have a situational awareness of both intelligence estimates and ongoing activities to focus their efforts at a particular time and area. Finally, the requirement for timeliness in processing and reporting may vary, depending on the stage of the operation; monitoring personnel must be aware of current timeliness requirements.
- Provide Redundancy in the Monitoring Plan. The monitoring plan should ensure that there are at least two sites that can monitor data from each sensor or relay, whenever possible. This helps prevent data loss should one site fail to receive the data transmission, experience equipment malfunction, or be required to interrupt monitoring activities. Being able to provide this redundancy relies on numerous factors, to include the number of sensor mobile

- Make Full Use of All Monitoring Equipment. Sensor monitoring equipment is not usually be held in reserve. Establishing multiple monitoring sites helps provide redundancy in the monitoring system and facilitates rapid sensor data dissemination throughout the force.

Planning Considerations. Planning considerations include the following:

- Selection of Monitoring Technique. The choice of monitoring technique is dictated primarily by the concept of operations and the remote sensor application being used (general surveillance, early warning, or target acquisition). While continuous monitoring from fixed sites is the preferred monitoring technique, this technique is probably only applicable to relatively static defensive situations. In most cases, a mix of monitoring techniques must be employed throughout the course of an operation—the technique used in each phase being based on the operational situation and the sensor information requirements pertinent to that phase of the operation.
- Location of Monitoring Sites. Selecting locations for monitoring sites is based on several factors. The most important consideration is the requirement to establish communications line of sight. The second most important factor is the ability to provide sensor data to the supported unit. Every effort is made to collocate the monitoring site with the supported unit's command post or one of its subordinate elements; collocation simplifies and speeds the dissemination of sensor reporting. If collocation is not possible, communications plans must be developed to ensure expeditious sensor data dissemination. Other important considerations in site selection are security, accessibility, and supportability.
- Allocation of Monitoring Responsibilities. Ideally, all emplaced sensors should be monitored from a single site, providing a completely integrated monitoring effort; line of sight considerations rarely permit such centralization of the monitoring regime. Thus, responsibility for monitoring different segments of the sensor network must be divided among monitoring sites. Line of sight and the support relationships in effect at the time are the main factors considered in determining how monitoring responsibilities are allocated among the monitoring sites. Allocation decisions should provide for redundancy by assigning primary and secondary monitoring responsibilities for each sensor string to two different monitoring sites.
- Displacement Requirements. The requirement to displace monitoring sites is contingent on the concept of operations. Consideration must be given to the timing and conduct of displacements to ensure there is no loss of monitoring capability, particularly during critical phases of the operation.

The Sensor Monitoring Plan. Based on guidance provided by the sensor planning cell, the GSP or GSP detachment commander develops the monitoring plan. This plan becomes part of the sensor surveillance plan. The plan should include—

- Monitoring technique(s) to be employed.
- Time and location for establishing monitoring sites.
- Sensor monitoring responsibilities by site and string.
- Designation of the senior monitoring site.
- Sensor data reporting thresholds and procedures.

- Displacement procedures
- Instructions for coordination with supported units and units located in proximity to monitoring sites.

Conduct of Sensor Monitoring Activities

Automated Monitoring. The TRSS provides automated support for most monitoring functions. Computers in the SMMS process correlate, and display sensor activations for analysis by the operator. They also provide automated support for the generation of standard sensor reports. The monitoring can also be performed manually. In manual monitoring, the operator must record and process all data and generate reports by hand. Because automated monitoring is faster, more accurate, and can process data from more sensors, it is the preferred method. The manual mode should be used only to support remote monitoring activities or in the event of automated equipment failure.

Near Real-Time Monitoring Procedures. In NRT monitoring, sensor activations are processed and analyzed as they are received. Sensor operators generate and disseminate reports according to the monitoring and dissemination plan. The emphasis is on rapid dissemination of. sensor data. While detailed analysis can provide additional information regarding the movement and classification of detected targets, sensor operators must ensure that extensive analysis does not delay the reporting of basic data. Additional information can be forwarded to amplifying reports.

Store and Exploit Monitoring Procedures. In this technique, sensor operators must quickly review all stored activations, analyze any patterns of activity detected, and identify key information concerning critical movements or areas. Key information is reported first; detailed analysis and reporting of non-time sensitive data is performed later.

Monitoring Site and Operator Responsibilities. In addition to carrying out the monitoring and reporting plan, each monitoring site or operator—

- Coordinates for use of area of operations. Even if the location of a monitoring site is directed by the monitoring plan and coordinated by the SARCC, site personnel must still coordinate with the operations section of the unit responsible for the area in which the site will be established. Details to be coordinated include precise location of site, displacement procedures, information exchange, site security, and logistics.
- Maintains situational awareness. The monitoring site must be aware of the operational situation to anticipate enemy activity, hand off targets or monitoring responsibilities from one site to another, denotes changes in supporting relationships, requirements to increase timeliness in reporting, and possible displacements. Situational awareness is maintained through contact with the SARCC or other controlling agency and coordination with the friendly units located in proximity to the monitoring site.
- Provides initiative reporting. In addition to primary reporting responsibilities, monitoring sites should provide sensor reports on information of interest to units located in proximity to the site.
- Maintains status of sensors and relays. The monitoring site tracks the status of all sensors and relays in its assigned sector of the sensor network. The site must provide appropriate status

and change-of-status reports to the SARCC and GSP detachment headquarters to ensure the supported unit is aware of the current state of the sensor system.

- Remains responsive to changing requirements. The monitoring site must be prepared to assume responsibility for monitoring sensors assigned to other sites, use a different monitoring technique, shift reporting responsibilities in accordance with changing support relationships, or displace to maintain contact with the supported unit. This responsibility includes the use of mobile monitoring sites through use of organic assets such as the joint lightweight tactical vehicle and increases the survivability of SETs.

DISSEMINATING SENSOR INFORMATION

Reporting Techniques

Format. The SENREP is the standard format used to report sensor data (See Figure 5-1). This format is used for voice, data, and hard copy reports. The general state of the sensor network, changes in the status of specific sensor strings and relays, and planned sensor activities can be reported using the sensor status report. Other information concerning the sensor network and monitoring activities of primary interest to GSP personnel (implants, changes in monitoring responsibilities, etc.) is reported using the Joint Remote Sensor Report Request. The common intelligence workstation is equipped with software to process both SENREPs and Joint Remote Sensor Report Request. Using these standard formats permits the direct exchange of sensor information between monitoring sites and units equipped with the intelligence analysis system, facilitating rapid integration of this information with other intelligence.

TITLE	SENDER ID	SEQ NO	CLASS	RELEASABLY DOR	ENVIR/OPNAME
1. SENREP	1STGSPHQ	016	U	UK 941117	TAND
METHSTSTR-NO	TIME	QTY	TGT-TYP	SUB-TYP	SPD DIR COL-LGTH
2. MM114A	1411Z	004	VECHICL	WHEEL	030 SE 300M
ETA-LOC	ETA				
3. COMMENTS					
4. CONT OF ACTIVITY RPTD SENREPS 013-15/MAJ ACTIVITY NOTED MOVING SE ALONG HWY 101 THRGHOUT AM HOURS//					
LEGEND **ETA** estimated time of arrival **LOC** line of communications					

Figure 5-1. Sensor Report Example.

Report Preparation. Preparing a report is discussed in the following paragraphs.

Sensor Report. Prepare SENREPs when the sensor operator determines activity has been detected by a particular sensor or sensor string. Operators will typically use the SMMS' automated processing capability to generate these reports.

Sensor Status Reports. Sensor status reports are employed only when the requirement to keep MAGTF elements informed of the state of the sensor network cannot be met by liaison with the various GSP elements or other regular intelligence collection status reporting The MAGTF G-2/S2 direct the use of the sensor status report. The senior GSP element prepares this report, which typically covers a 24-hour period.

Joint Remote Sensor Report/Request. The joint remote sensor report/requests are used primarily to exchange technical data between sensor units. They are prepared on an as-required basis by the appropriate GSP element.

Report Timeliness. Timeliness of sensor data reporting is critical, particularly when sensors are used in early warning or target-acquisition applications. The sensor monitoring and reporting plan should specify reporting thresholds (i.e., criteria for sensor activations that should trigger a report, and the timeliness required for the report based up on the type of information contained in the report). Table 5-1 depicts an example of sensor reporting criteria. Sensor operators must ensure the prompt reporting of critical sensor data is not delayed in order to perform extensive analysis.

Table 5-1. Sensor Reporting Criteria Example.

Activity	Size	Report Timelines
Personnel Movement	Less than platoon size	20 minutes
Personnel Movement	Platoon size or larger	15 minutes
Vehicle movement	4 vehicles or fewer	10 minutes
Vehicle movement	5 vehicles or more	Immediately

Information Flow

Reporting Chain. The support relationship in effect at the time determines the reporting chain to be used.

General Support. In general support, SENREPs is usually sent to the SARCC and the MAGTF all-source fusion center for correlation with other sensors and reconnaissance and surveillance information and dissemination throughout the force. If no SARCC is established, the senior monitoring site might act as the central reporting node for sensor information; however, the GSP commander must ensure that centralization does not adversely affect the timeliness of the reporting.

Direct Support. In direct support, reports go directly to the supported unit, as directed by that unit's G-2/S-2. Typically, SENREPs will be sent to the supported unit's SARCC, or if no SARCC is established, to the intelligence watch section of the combat operations center.

Broadcast and Lateral Dissemination. Sensor information should be made available to any unit that wants it. To the maximum extent possible, sensor reports are transmitted in a broadcast mode, and any unit with the capability of entering the sensor reporting net is permitted to receive the SENREPs. When broadcast reporting is not possible, monitoring sites attempt to provide lateral dissemination of critical SENREPs to the units most directly affected by the reports.

Dissemination Means. Sensor reports lend themselves to processing and dissemination over data circuits; data circuits should be used to transmit sensor information whenever possible. If data transmission is not available, voice radio should be used to pass key SENREPs with other sensor reports being sent by other means.

Disseminating the Information

Sensor information is used like any intelligence information: it is analyzed and combined with other intelligence information in an effort to build a complete picture of the area of operations and the threat. Sensor reports are typically sent from the SARCC to the supported unit's G-2/S-2 watch. The intelligence watch integrates the report with other intelligence to refine the target classification and analyze the significance of the detection. After analysis, the sensor information is passed to the appropriate operations agency for action or combined with other information in standard intelligence reports. The specific utilization of sensor information is based on the concept of operations and sensor application being employed.

General Surveillance. Sensors are used to help define the nature and level of activity in the surveillance area as well as identify the high- and low-density lines of communications. This information is used in the overall threat assessment; to formulate the concept of operations; select beaches, helicopter landing zones, and objectives; and refine the intelligence collection plan to target specific areas of enemy activity. In this application, the timeliness of the sensor data is not typically as critical as the completeness of the information.

Early Warning. To provide early warning, sensors are emplaced at considerable distance (15-100+ km) from friendly positions along potential enemy avenues of approach. In this application, sensors are typically used to provide initial indications of enemy movement down these avenues. The SENREPs can be used to trigger various responses, to include focusing additional intelligence assets on the threatened area, raising the alert status of the appropriate units, or initiating of pertinent defensive plans.

Target Acquisition. Extensive analysis and integration with other intelligence is required to use sensors for target acquisition. Sensors must be placed in areas of known enemy activity and the network developed in sufficient density to permit detection and tracking of a target into established supporting arms target areas. Typically, SENREPs are used to cue other target acquisition assets to focus on a particular area; unmanned aircraft system, ground reconnaissance elements, air or ground observers are dispatched to confirm the nature and identity of the target and control the fire mission(s). Occasionally, sensor information alone can be used to initiate the use of long-range fires. However, the result of this process is generally unobserved fire on unconfirmed targets. When employing sensors to assist target acquisition efforts, care must be taken not to compromise the locations of sensor strings by repeated or continuously attacking targets located near a particular string. Emerging capabilities allows GSP an increased target acquisition capability through use of unmanned aircraft systems.

CHAPTER 6.
COMBAT SERVICE SUPPORT

Routine combat service support is provided to the GSP or GSP detachments by the commander with ADCON. The TRSS is designated as a critical low density (CLD) item, which affects both maintenance and supply support as detailed below. There are no other unique administrative or logistics requirements associated with remote sensors.

MAINTENANCE

The GSP is authorized to perform both organizational and intermediate maintenance on CLD TRSS components. Sensor operators perform first echelon maintenance within the SETs while sensor maintenance technicians, in the GSP's headquarters section, carry out second- through fourth- echelon maintenance. A limited depot maintenance float is available to support fourth- and fifth- echelon maintenance. Maintenance support for all other non-TRSS unique equipment is provided in accordance with normal maintenance procedures.

SUPPLY

Supply support for critical low-density TRSS components are initially provided through contractor support. Thereafter, supply support is provided through routine supply procedures. After initial provisioning, the maintenance float and a small war reserve become the only sources of replacement items. Other supply requirements are provided by the commander with ADCON. Remote-sensor equipment does not use any unique consumables; standard batteries used by sensors and relays are the primary TRSS consumables.

TRANSPORTATION

TRSS is transportable by airlift and sealift and presents no special embarkation problems. The GSP table of equipment provides sufficient organic motor transport to move sensors, relays, and monitoring equipment. External support is required to move TRSS maintenance shelters.

CHAPTER 7.
TRAINING

TYPES OF TRAINING

Training for remote-sensor operations encompasses—

- TRSS orientation and familiarization.
- TRSS planning and employment.
- Operator training.
- Maintenance training.
- Sensor emplacement training.
- MAGTF training.
- Infantry Tactics training.
- Scouting training.
- Advanced Communication training.

TACTICAL REMOTE SENSOR SYSTEM ORIENTATION AND FAMILIARIZATION

Intelligence Personnel

All intelligence personnel receive instruction on the capabilities, limitations, and employment of remote sensors as part of their formal military occupational specialty school training. In addition, TRSS orientation and familiarization should be incorporated into unit intelligence training programs and employment should be incorporated into instruction on organic intelligence capabilities in formal professional military education (PME) courses. Unit PME programs should include TRSS orientation and familiarization in any classes covering intelligence collection or reconnaissance and surveillance. The GSP can provide support to unit PME programs.

SENSOR EMPLACEMENT TRAINING

Units with primary or secondary responsibilities for emplacing sensors and relays (e.g., light armored reconnaissance battalions and reconnaissance companies or platoons) incorporate sensor emplacement training as part of their regular training syllabus. This training is conducted jointly with a GSP element. The TRSS employment should be incorporated into all types of MAGTF training. The goal of this training should be to integrate remote sensor operations with other

reconnaissance and surveillance activities of the MAGTF as well as enhance the capability to conduct emplacement and monitoring operations. Remote sensors should be used in all applications and in varied support relationships during the course of major training evolutions.

MAGTF TRAINING

Command Post Exercises and Staff Exercises

Remote-sensor employment should be included in all command post exercise and staff exercises. The emphasis in this type of exercise is on planning remote-sensor operations and disseminating and using sensor data. During a command post exercise or MAGTF Staff Training Program, the intelligence collections section should exercise the sensor planning cycle and develop a realistic emplacement plan, rather than administratively placing sensors on the exercise map board. Some GSP representatives should be provided to any exercise control group to validate the sensor surveillance plan and generate simulated sensor reports.

Field Training Exercises

Field training exercises should be used to practice sensor emplacement, monitoring, and reporting as well as planning and coordination procedures. Opportunities to conduct tactical vice administrative implant missions must be exploited whenever possible. The GSP must be aggressive in seeking and utilizing training evolutions of other units to provide remote sensor operations training. The GSP detachments can be used in exercises down to the battalion level and in support of the exercise and opposing forces to provide maximum operator training.

GLOSSARY

Section I: Acronyms and Abbreviations

ADCON	administrative control
CLD	critical low density
DoD	Department of Defense
G-2	assistant chief of staff, intelligence/ intelligence staff section
GCE	ground combat element
GSP	Ground Sensor Platoon
IPB	intelligence preparation of the battlespace
MAGTF	Marine air-ground task force
MCRP	Marine Corps reference publication
MEF	Marine expeditionary force
MEU	Marine expeditionary unit
NAI	named area of interest
NRT	near real time
OPCON	operational control
OPSEC	operations security
PME	professional military education
S2	intelligence officer/office
SATCOM	satellite communications
SARCC	surveillance and reconnaissance coordination center
SENREP	sensor report
US	United States
VHF	very high frequency

The following acronyms pertain specifically to this publication.

SES	sensor employment squads
SET	sensor employment teams

SMG	sensor monitoring group
SMMS	sensor mobile monitoring system
TRSS	tactical remote sensor system

Section II: Terms and Definitions

area of influence
An area of inclusive of and extending beyond an operational area wherein a commander is capable of direct influence by maneuver, fire support, and information normally under the commander's command or control. (DoD Dictionary)

area of interest
That area of concern to the commander, including the area of influence, areas adjacent to it, and extending into enemy territory. Also called **AOI**. (DoD Dictionary)

area of operations
An operational area defined by a commander for the land or maritime force commander to accomplish their missions and protect their forces. Also called **AO**. (DoD Dictionary)

avenue of approach
An air or ground route of an attacking force of a given size leading to its objective or to key terrain in its path. Also called **AA**. (USMC Dictionary)

command and control
(See DoD Dictionary for core definition. Marine Corps amplification follows.) The means by which a commander recognizes what needs to be done and sees to it that appropriate actions are taken. Command and control is one of the seven warfighting functions. Also called **C2**. (USMC Dictionary)

course of action
1. Any sequence of activities that an individual or unit may follow. 2. A scheme developed to accomplish a mission. Also called **COA**. (DoD Dictionary)

direct support
A mission requiring a force to support another specific force and authorizing it to answer directly the supported force's request for assistance. Also called **DS**. (DoD Dictionary)

emission control
The selective and controlled use of electromagnetic, acoustic, or other emitters to optimize command and control capabilities while minimizing, for operations security: a.detection by enemy sensors, b. mutual interference among friendly systems, and/or c.enemy interference with the ability to execute a military deception plan. Also called **EMCON**. (DoD Dictionary)

General support
Support given to the supported force as a whole and not to any particular subdivision thereof. Also called **GS**. (DoD Dictionary)

intelligence preparation of the battlespace
(See DoD Dictionary for core definition. Marine Corps amplification follows.) The systematic, continuous process of analyzing the threat and environment in a specific geographic area. Also called **IPB**. (USMC Dictionary)

named area of interest
(See DoD Dictionary for core definition. Marine Corps amplification follows.) A point or area along a particular avenue of approach through which enemy activity is expected to occur. Activity or lack of

activity within a named area of interest will help to confirm or deny a particular enemy course of action. Also called an **NAI**. (USMC Dictionary)

operational control
(See DoD Dictionary for core definition. Marine Corps amplification follows.) With respect to a flight, the exercise of authority over initiating, conducting, or terminating a flight. Also called **OPCON**. (USMC Dictionary)

operations security
A capability that identifies and controls critical information, indicators of friendly force actions attendant to military operations, and incorporates countermeasures to reduce the risk of an adversary exploiting vulnerabilities.Also called **OPSEC**. (DoD Dictionary)

processing
A system of operations designed to convert raw data into useful information. (DoD Dictionary)

reconnaissance
A mission undertaken to obtain information about the activities and resources of an enemy or adversary, or to secure data concerning the meteorological, hydrographic, geographic, or other characteristics of a particular area, by visual observation or other detection methods. (DoD Dictionary)

remote sensor
Device that detects the physical presence of an object by means of energy reflected or emitted by the object, and then transmits information derived from the detection to a specially equipped monitoring site located beyond visual observation range of the sensor. (Upon approval of this revised publication, this term and its definition will be included in the USMC Dictionary.)

sensor
Equipment that detects, and may indicate, and/or record objects and activities by means of energy or particles emitted, reflected, or modified by objects. (USMC Dictionary)

sensor string
A grouping of two or more remote sensors emplaced within the same area to provide coverage of a specific surveillance target such as a road intersection, choke point or objective. (Upon approval of this revised publication, this term and its definition will be included in the USMC Dictionary.)

surveillance
(See DoD Dictionary for core definition. Marine Corps amplification follows.) The systematic visual or aural observation of an enemy force, adversary, named area of interest, or an area and the activities within it to collect intelligence required to confirm or deny enemy/adversary courses of action or identify their critical vulnerabilities and limitations. (USMC Dictionary)

target
An entity or object that performs a function for the threat considered for possible engagement or other action. (DoD Dictionary)

target acquisition
The detection, identification, and location of a target in sufficient detail to permit the effective employment of capabilities that create the required effect. (DoD Dictionary)

targeting
The process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (DoD Dictionary)

The following acronyms pertain specifically to this publication.

remote sensor system
Integrated system of sensors, relays and monitoring equipment which provides a sensor surveillance capability.

sensor net (or network)
An integrated system of sensors strings, relays, and monitoring sites established to provide sensor surveillance over all or part of the area of operations.

Section III: Nomenclature

ETU-II	Encoder Transmitter Unit II
IRID-II	Infrared Intrusion Detector Version II
MagID-II	Magnetic Intrusion Detector Version II

REFERENCES AND RELATED PUBLICATIONS

Joint Issuances

Joint Publications (JPs)

2-0 Joint Intelligence

3-0 Joint Campaigns and Operations

3-06 Joint Urban Operations

3-59 Meteorological and Oceanographic Operations

3-60 Joint Targeting

4-0 Joint Logistics

5-0 Joint Planning

Miscellaneous

DoD Dictionary of Military and Associated Terms

Marine Corps Publications

Marine Corps Warfighting Publications (MCWP)

2-10 Intelligence Operations

Marine Corps Tactical Publication (MCTP)

2-10B MAGTF Intelligence Production and Analysis

Marine Corps Reference Publications (MCRP)

2-10A.6 Ground Reconnaissance Operations

Miscellaneous

Marine Corps Supplement to the DoD Dictionary of Military and Associated Terms