FM 40-1

Joint Tactical

Ground Station Operations

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DEPARTMENT OF THE

Field Manual
40-1

Headquarters
Department of the Army
Washington, D.C. 9 September 1999

Joint Tactical Ground Station Operations

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Preface

FM 40-1 is the doctrinal manual for US Army joint tactical ground station (JTAGS) operations. The document addresses all theater missile defense operational elements including passive defense, attack operations, active defense, and battle management, command, control, communications, computers, and intelligence (BM/C4I). This manual provides the doctrinal base for its integration into joint theater missile defense (JTMD) and explains how United States Space Command (USSPACECOM), through United States Army Space Command (ARSPACE) and theater commanders in chief (CINCs), commands and controls JTAGS operational units to contribute to JTMD. The policies, guidance, and information provided herein detail requirements necessary for successful coordination of JTAGS within the Army and other service components. Its contents apply to Army JTAGS operations worldwide.

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Chapter 1

Overview

The joint tactical ground station (JTAGS) is the transportable, mobile, in-theater element of US Space Command's (USSPACECOM) theater event system (TES). The JTAGS provides theater commanders a continuous 24-hour capability to receive and process direct downlinked data from space-based Defense Support Program (DSP) sensors. The JTAGS uses the downlinked data to disseminate early warning, alerting, and cueing information on tactical ballistic missiles (TBMs) and other infrared events of interest throughout the theater.

PURPOSE OF THE MANUAL

1-1. JTAGS represents a major Army contribution to theater missile defense (TMD) and is the subject of this manual. TMD refers to the identification, integration, and employment of forces, supported by theater and national capabilities, utilized to detect, identify, locate, track, minimize the effects of, and destroy enemy theater missiles. TMD is a coordinated joint service effort. The key to JTAGS theater support is its relatively direct connectivity and distribution architecture via a variety of voice reporting and data warning networks. A JTAGS section field emplacement is pictured in Figure 1-1.

Figure 1-1. JTAGS Field Emplacement

1-2. Event data is received directly from DSP satellites and covers the theater area of responsibility (AOR). The data is processed in theater and disseminated to both theater and worldwide users by both data and voice. By its in-theater location, JTAGS reduces the possibility of single-point failure in long-haul communication architectures. See Section IV of Chapter 3 for a detailed description of JTAGS' major systems.

1-3. This manual details how JTAGS is used to provide the geographic combatant commander in chief (CINC) or the joint task force commander with an in-theater capability that exploits DSP-supplied data to provide early warning, alerting, and cueing in near real time to counter and defeat the threat of TBMs. It provides doctrinal guidance to Army commanders at all levels: strategic, operational, and tactical. The manual's intended audience consists of joint theater planners, their service counterparts at combatant commands and subordinate elements who construct the CINC's theater operation plans (OPLANs), and the JTAGS detachment leader who is responsible for the mission accomplishment of the JTAGS section.

HISTORICAL PERSPECTIVE

1-4. During the Gulf War, the allied coalition committed tremendous resources to counter the Iraqi TBM threat. Strategic planners have assumed that other countries will continue to acquire and employ TBMs to threaten US or allied assets during future force projection operations. As the number of friendly force projection operations increases, TBMs will continue to pose a threat to troop concentrations and geopolitical assets. TMD will remain a priority to the joint task force commander until the TBM threat is completely nullified.

1-5. TBMs were used as weapons of terror against both military and geopolitical targets during the Gulf War and earlier in Iran and Iraq during the "War of the Cities." Now more than 25 countries have TBM capabilities and that number is expected to increase. Generally, TBM ranges are from 80 to 3,500 kilometers (km), and flight times vary from several minutes to tens of minutes.

1-6. The use of TBMs since World War II is listed in Table 1-1. Many countries continue to procure low cost TBMs, forcing military planners and strategists to consider their potential use when evaluating a potential foe's warfighting capabilities.

1-7. JTAGS meets the needs of the combatant CINC or joint task force commander for a reliable and responsive tactical capability to receive, process, and distribute information on TBMs for TMD active defense, passive defense, and attack operation purposes. The Gulf War demonstrated the need for accurate and timely reporting of TBMs launched within or into the theater. Near real-time information on TBM attacks is needed to efficiently and effectively employ TMD forces and to provide warning to threatened military forces and geopolitical centers.

Table 1-1. Ballistic Missile Use Since World War II

YEAR	EVENT	MISSILE
1944-1945	German attacks on Allies	V2
1973	Egyptian and Syrian attacks on Israel	Scud
1980-1988	Iran - Iraq War	Scud
1986	Libyan attacks on US Coast Guard base at Lampedusa, Italy	Scud
1989-1991	Afghan government use on Mujahideen	Scud
1991	Iraqi attacks during Persian Gulf War on Israel, Saudi Arabia, Bahrain	Scud
1994	Yemeni Civil War	Scud

1-8. Operation Desert Shield/Storm (ODS) highlighted the urgent need to separate TMD tactical operations from strategic warning system ground sites. For a significant portion of ODS, tactical support to theater forces by strategic space and ground-based systems was a secondary mission to strategic support. The tactical event reporting system (TERS) that supported the US missile defense capabilities during ODS provided warning information only, was subject to single-point failure, and placed a burden on long-haul communication systems. TMD systems used prior to JTAGS are shown in Figure 1-2.

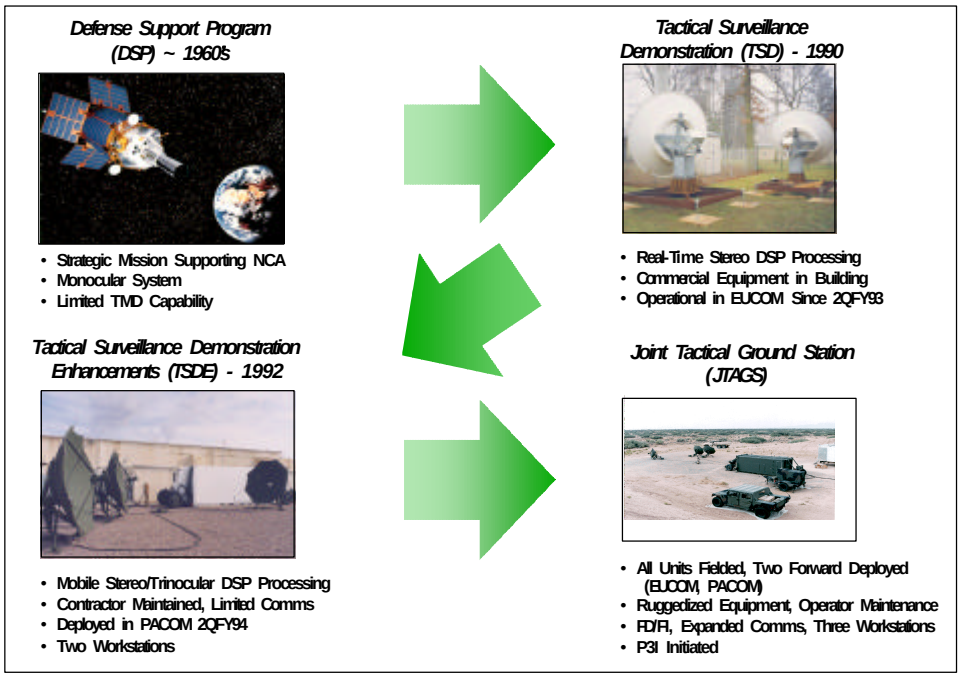


Figure 1-2. JTAGS Evolutionary History

1-9. A secondary voice reporting system, originating from the Missile Warning Center in Colorado Springs, CO, to the combatant CINC functions in the United States European Command, United States Pacific Command, United States Forces Korea, and United States Central Command (USCENTCOM). This voice reporting system was first used through the CINC CENTCOM execution network (an ultra-high frequency (UHF) satellite

communication (SATCOM) network) initiated during ODS. This voice reporting system is subject to weaknesses similar to those that were inherent to the TERS. Warfighting CINCs needed a dedicated, in-theater capability to collect and report TBM data with such accuracy and timeliness that the information could be used in real time to alert and cue theater missile defense forces and also expedite attack of the TBMs and their support infrastructure on the ground. JTAGS was created as the response to meeting those needs.

MISSION

1-10. Each combatant CINC will establish procedures by which allied and coalition forces will receive TBM attack warning and alerting messages. JTAGS accesses and interfaces with theater communication networks to transmit early warning, alerting, and, where possible, cueing reports on launched hostile ballistic missiles. JTAGS performs near real-time tactical event reporting by using specialized processing of data obtained from the DSP constellation. JTAGS also has the capability to support operations from adjacent theaters, given appropriate communication links. Figure 1-3 depicts a notional JTAGS deployed in an operational environment.

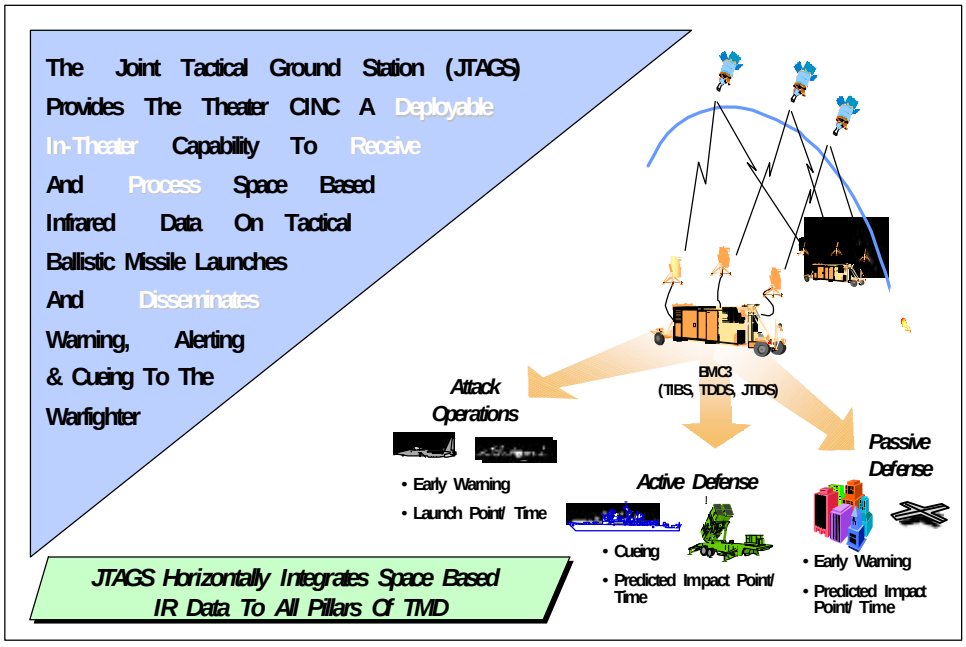


Figure 1-3. JTAGS Mission

1-11. JTAGS reports information to support the functional components of TMD: attack operations, active defense, passive defense, and the battle management/command, control, communications, computers, and intelligence (BM/C4I) structure that undergirds and facilitates the performance of each.

1-12. JTAGS reports estimated launch point coordinates, predicted ground impact point coordinates, and state vectors. Additionally, JTAGS produces and distributes reports concerning selected static infrared (IR) events.

THEATER EVENT SYSTEM

1-13. TES is USSPACECOM's missile detection and warning architecture that provides reliable, comprehensive tactical warning support (assured warning) to theater elements. USSPACECOM coordinates tactical warning via a system of systems with similar tactical support missions: JTAGS (Army and Navy), attack and launch early reporting to theater (ALERT) (Air Force), and tactical detection and reporting (TACDAR). These programs comprise the TES and mutually support each other in the mission of tactical missile and other event reporting to theater.

1-14. USSPACECOM executes the missile-warning mission through the joint strategic capabilities plan (JSCP) and is the owner/operator of the DSP satellite constellation. USSPACECOM and the North American Aerospace Defense Command (NORAD) jointly operate the Missile Warning Center-Tactical (MWC-T) as part of the Cheyenne Mountain Operations Center (CMOC) that provides day-to-day coordination of TES operations. Because JTAGS is under the combatant command (COCOM) of Commander in Chief, United States Space Command (USCINCSPACE), major taskings, such as deployment or exercise participation, are required to be coordinated through the USSPACECOM Director of Operations (J3). The components of the TES are presented in Figure 1-4.

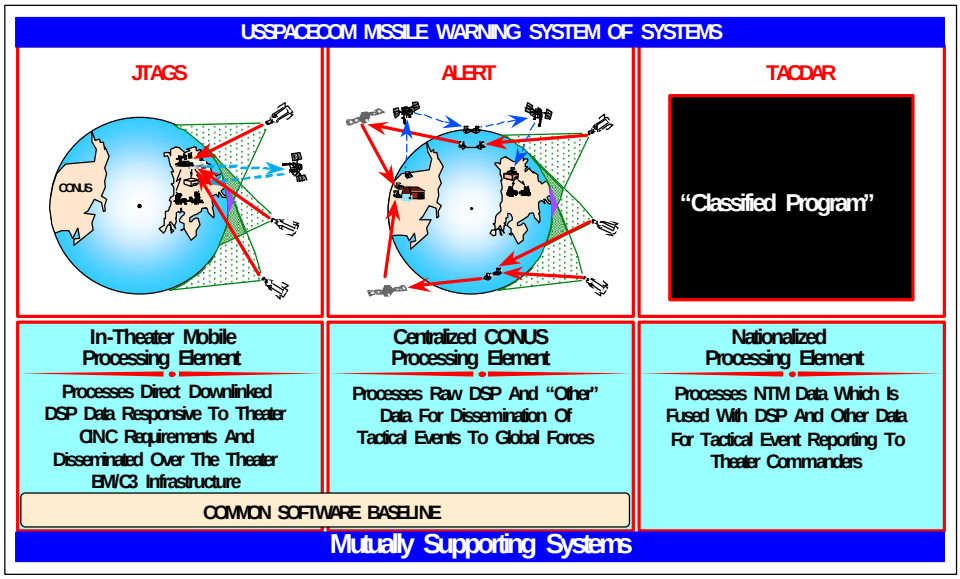


Figure 1-4. In-Theater TES

1-15. United States Army Space Command (USARSPACE) and Naval Space Command (NAVSPACECOM), both component commands of USSPACECOM, are responsible for training, manning, operating, and equipping JTAGS systems. USARSPACE is the component lead and is responsible for day-to-day operation, control, and support (OPCON) of JTAGS. Inter-service support agreements are coordinated by USARSPACE to support equipment and personnel of the forward-deployed JTAGS units.

LAYOUT OF THE MANUAL

1-16. Chapter 1 examines how the Gulf War validated the requirement for accurate and timely reporting of TBMs launched into a theater. Near real-time information on TBM attacks is needed to efficiently and effectively employ theater missile defenses. JTAGS provides this information.

1-17. Chapter 2 discusses command relationships during varying theater scenarios: peacetime and special wartime.

1-18. Chapter 3 examines JTAGS support of the operational elements of theater missile defense, JTAGS force structure, responsibilities of key section personnel, major equipment subsystems, system capabilities and limitations, JTAGS modes of operation, strategic and tactical deployment considerations, communication systems employed by JTAGS, the information distribution concept, and connectivity requirements.

1-19. Chapter 4 discusses planning considerations of which theater planners and logisticians must be knowledgeable, combat service support responsibilities, the unique maintenance procedures for JTAGS, transportation capabilities, support services required for personnel, reconstitution actions to restore damaged equipment, physical security requirements, and facility requirements.

1-20. The appendixes provide detailed information and guidance for the soldiers and sailors who are responsible for accomplishing the JTAGS mission.

Chapter 2

Command and Control

JTAGS command and control (C2) is founded on joint doctrine and the unified action of armed forces. Specifically, USSPACECOM's Concept of Operations for Command and Control of Space Forces, (CONOPS for C2 of Space Forces), dated September 23, 1998, furnishes the structure of command relationships and facilitates the full integration of JTAGS into joint and combined operations to maximize its support to warfighting forces. The command and control structure is designed to provide the flexibility and responsiveness needed to meet the dynamic environment in which JTAGS operates.

PEACETIME

2-1. USCINCSPACE, as supporting CINC to combatant (theater) CINCs, has COCOM of JTAGS. The USARSPACE commander has OPCON of JTAGS. A JTAGS element will normally remain COCOM to CINCSPACE and OPCON to ARSPACE while serving in a general support role to the theater CINC. Normal peacetime command and control relationships are depicted in Figure 2-1. This figure also reflects the routine general support relationship between the theater CINC and the deployed JTAGS element.

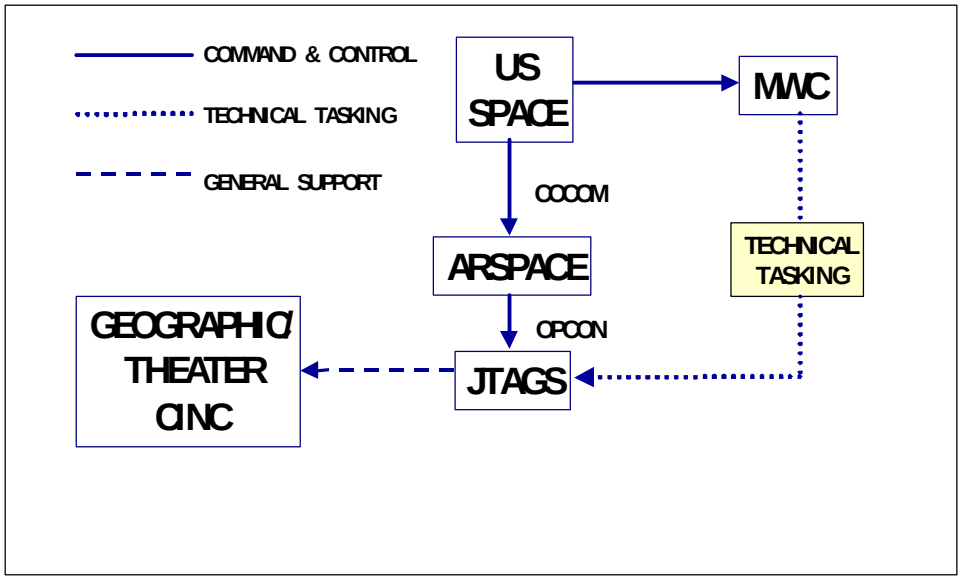


Figure 2-1. Peacetime C2 and General Support

2-2. JTAGS is positioned and operated to meet the specific taskings of USSPACECOM and its support agreements with combatant CINCs. One

JTAGS detachment headquarters with one JTAGS section is deployed in the Far East and the other is in Europe. These forward-deployed JTAGS elements provide general support to their respective CINCs by conducting continuous 24-hour operations.

2-3. Two sections, located in the continental United States (CONUS), train to maintain combat readiness for immediate contingency deployment. These sections also support both CONUS and outside continental United States (OCONUS) exercises. A third CONUS-based section, whose primary role is to support contingency operations, also performs a supporting role in JTAGS individual qualification training.

SPECIAL WARTIME

2-4. During periods of increased tension or active conflict with a chance of tactical missile activity, one or more of the CONUS-based JTAGS sections may deploy forward. The JTAGS system currently in theater may remain in place or deploy to another location within theater. Because JTAGS receives data directly from space-based sensors and can use long-haul communications, equipment limitations do not require JTAGS to be geographically located within a theater of conflict in order to provide support. For example, a JTAGS section could support a conflict in Korea from positions off the peninsula and still provide support throughout the PACOM AOR. Because of improved timeliness and assuredness of warning receipt, however, JTAGS is normally and best utilized by positioning it in theater where it can link directly into the combatant CINC's tactical operations center (TOC).

2-5. Major tasking, such as redeployment of a JTAGS element, must be coordinated through the USSPACECOM J3. Continuous mission support during alert and deployment will be provided to meet the combatant CINC's requirements under the direction of USSPACECOM through its component command until such time that a JTAGS section is operational in theater. Upon implementation of a combatant CINC's OPLAN, designated JTAGS assets will deploy in accordance with it. A JTAGS section may be forward deployed on a temporary or rotational, basis to satisfy anticipated mission requirements and to preclude airflow competition with combat forces. COCOM will be retained by USCINCSPACE, and OPCON retained by ARSPACE. Command relationships are summarized in Figure 2-2.

2-6. Military doctrine prescribes that a commander directly responsible for accomplishing a mission should have operational control of forces supporting that mission whenever practical. Because of the global nature of space forces, one of which is JTAGS, CONOPS for C2 of Space Forces states that two conditions must normally be met in order for the transfer of OPCON from USSPACECOM to a CINC to be practical:

- The employment of the space force would have a regional effect only, with JTAGS primarily supporting a specific joint operating area.
- JTAGS must be located or deployed inside the joint operating area.

2-7. These two conditions will normally be met in the specific and special circumstance of transferring OPCON from USSPACECOM to a combatant CINC. This scenario is the exception rather than the rule. As previously stated, the routine JTAGS relationship with the combatant CINC is one of general support. In exceptional circumstances, OPCON may be granted to the combatant CINC.

Figure 2-2. JTAGS Command and Control

2-8. CONOPS for C2 of Space Forces states that the actual transfer of space forces (OPCON) can only be done by the Secretary of Defense (SECDEF). When JTAGS is transferred to a supported combatant CINC, the SECDEF will specify the appropriate command relationship and limits of authority. Upon SECDEF approval, OPCON is assigned to the combatant CINC, or joint task force commander, and JTAGS becomes a support asset for the commander. The Director of Operations (J3), Joint Forces Air Component Commander (JFACC), or Area Air Defense Commander (AADC) may exercise OPCON on behalf of the combatant CINC. Special wartime command and control relationships are depicted in Figure 2-3.

2-9. A combatant CINC will request allocation and deployment of JTAGS resources based on consideration of the assessed capabilities and intentions of the threat along with the probability of tactical missile employment. JTAGS systems are forward deployed in order to facilitate airlift into theater. JTAGS system deployment will be preplanned and prioritized in the time-phased force deployment list (TPFDL). The in-theater deployment location of a JTAGS unit will be allocated in accordance with the theater CINC's needs.

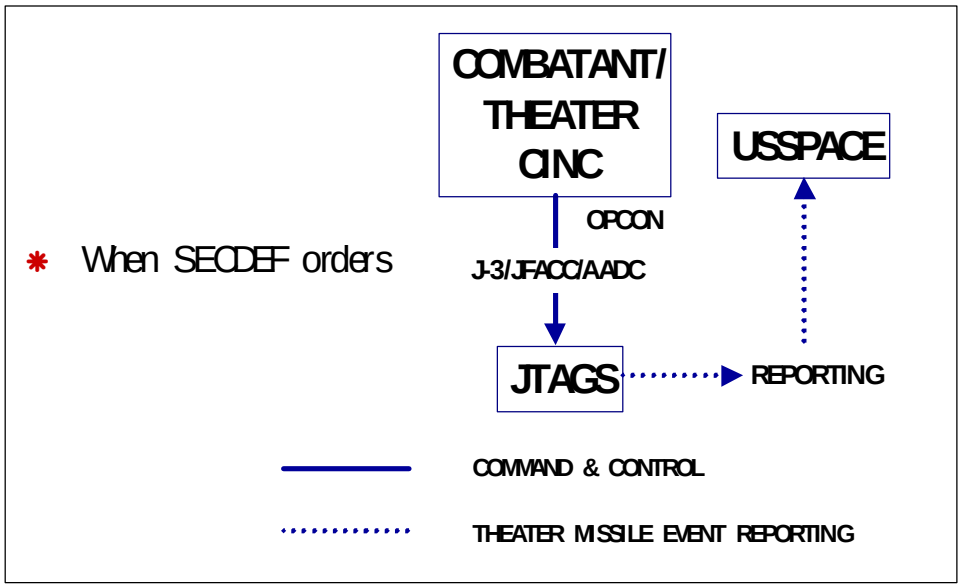


Figure 2-3. Special Wartime Command and Control

2-10. JTAGS deployments are depicted in Figure 2-4.

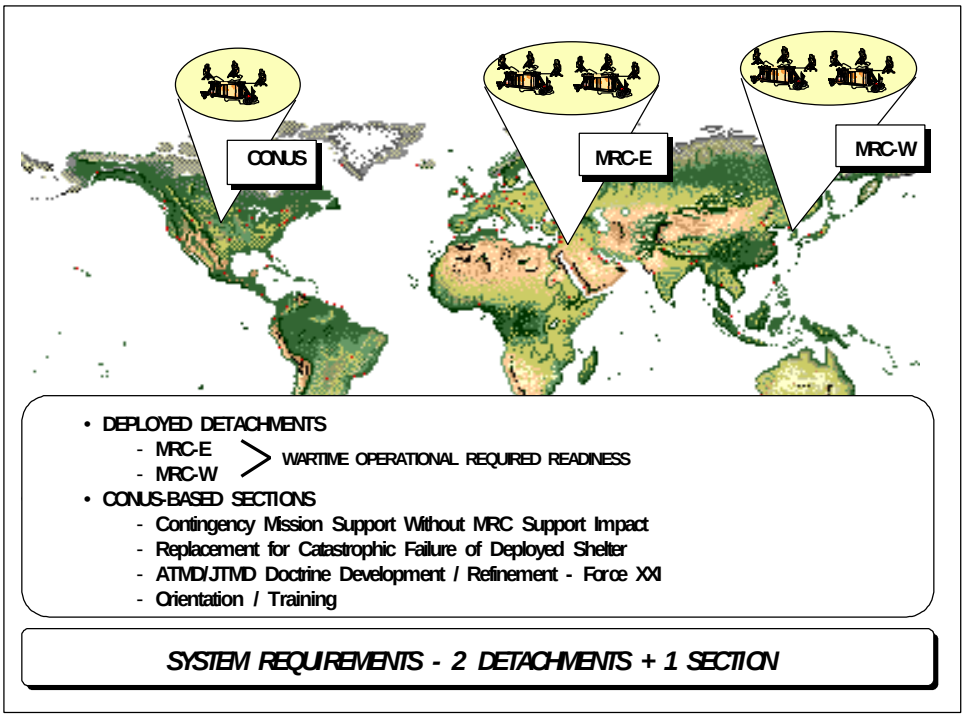


Figure 2-4. JTAGS CINC Support

2-11. In-theater site selection will be based on sensor access, communications system access, base support and security services, and environmental and survivability criteria. Generally, JTAGS will be deployed to a secure rear area that provides requisite communications access. See paragraphs 3-60 and 3-62 and Appendix B for details.

CONTROL

2-12. USSPACECOM and NORAD jointly operate the Missile Warning Center (Tactical) (MWC-T) as part of the Cheyenne Mountain Operations Center, which provides day-to-day coordination of TES operations. In coordination with the theater CINC, USSPACECOM and NORAD:

- Establish areas of interest (AOIs) for each JTAGS detachment.
- Provide intelligence on theater-specific missiles.
- Designate intelligence periods of interest.

2-13. Theaters should coordinate TES issues through the USSPACECOM J3. In their general support roles to theater CINCs, JTAGS units coordinate deployment/positioning within the theater, requests for support of specific voice reporting networks, and other operational functions with the theater command.

Chapter 3

JTAGS Detachment Operations

Commanders seek to apply overwhelming combat power to achieve victory over the enemy with minimum casualties to friendly forces and assets. Combat power combines the elements of maneuver, firepower, protection, and leadership to achieve battlefield dominance. While contributing to all four elements of combat power, TMD makes its greatest contribution through force protection. Protection conserves the fighting potential of fielded elements, enabling the commander to apply overwhelming combat power at the decisive time and place. Force protection includes all the active and passive actions that units and individuals take to preserve combat power and deny the opposition the ability to successfully attack friendly forces.

SECTION I ¾ THEATER MISSILE DEFENSE OPERATIONAL ELEMENTS

3-1. JTAGS supports all TMD operational elements: passive defense, attack operations, active defense, and BM/C4I.

3-2. The key to JTAGS theater support is its relatively direct connectivity and distribution architecture via a variety of voice reporting and data warning networks, particularly when it is deployed in theater and linked directly to a TOC. Event data is received directly from DSP satellites covering the AOR, processed in theater, and disseminated to both theater and worldwide users by data and by voice. By its in-theater location, JTAGS reduces the possibility of single-point failure in long-haul communication architectures.

PASSIVE DEFENSE

3-3. Passive defense measures are initiated to reduce vulnerability and to minimize the damage caused by TBM attacks. Passive defense includes TBM early warning, nuclear, biological, chemical (NBC) protection, countersurveillance, deception, camouflage and concealment, hardening, electronic protection, mobility, dispersal, redundancy, recovery, and reconstitution. It provides for essential individual and collective protection for friendly forces, population centers, and critical assets. Passive defense measures should be planned whenever US forces face a threat.

3-4. Passive defense measures may be employed by ground forces and threatened civilian populations either as preparatory activity or in direct response to receipt of a TBM attack warning message from the JTAGS. A warning report contains the predicted ground impact point and time, allowing for selective redistribution of information to the targeted area. The

intent is to maximize the warning time and, thereby, minimize the effects of TBMs not destroyed in flight and collateral effects from TBM engagements.

3-5. The highest echelon elements using JTAGS information to initiate passive measures will receive JTAGS information directly and primarily by data, while lower and lowest echelons will receive JTAGS information indirectly and primarily by voice broadcast. In accordance with Joint Publication 3-01-5, Joint Theater Missile Defense (11-7), component commanders are responsible for providing warning to assigned and attached forces in sectors vulnerable to attack. Recipients of voice warning messages received directly from the JTAGS will retransmit these warnings to subordinate echelons via their own organic networks. The difference in size between Desert Storm era and JTAGS warning areas is shown graphically in Figure 3-1.

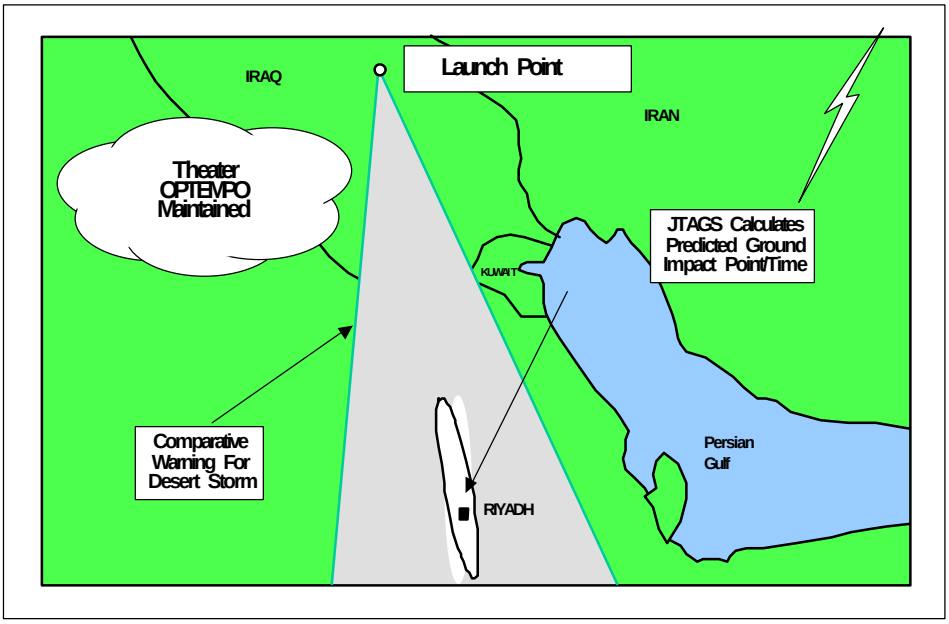


Figure 3-1. Passive Defense

3-6. Although voice reporting messages are expected to predominate in the passive defense arena, some units may also receive data warning messages, convert these to voice formats, and then initiate the implementation of their internal warning procedures. Host-nation and combined forces will normally be beneficiaries of JTAGS information, and theater commanders will determine how to best disseminate warning information to them.

ATTACK OPERATIONS

3-7. Attack operations apply to operations initiated to destroy, disrupt, or neutralize TBM launch platforms and their supporting command, control, and communication nodes; logistic structures; and reconnaissance, intelligence, surveillance, and target acquisition platforms. Attack operations require a fully integrated architecture for acquisition, processing attacks, and attack assessment of these targets. Not a mission unto itself, attack

operations characterize and integrate all actions initiated against TBM launch platforms and their supporting infrastructure. Attack operations can be preemptive or reactive as part of other military actions. Attack operations are challenged to detect TBM systems since they are normally dispersed, mobile, electronically quiet, and redundant, all of which makes striking them difficult.

3-8. Attack operations command and control nodes will be provided with JTAGS-produced launch point/time information to facilitate planning and execution of fire missions and other offensive missions (e.g., air strike or special operation force attacks) against TBM launchers and infrastructure. Army attack operation units equipped with tactical information broadcast service (TIBS) receivers (commanders tactical terminals (CTTs)) have the capability to receive information from the JTAGS via broadcast networks, thereby shortening response times on receipt of a fire mission. TIBS receivers are expected to be employed at corps, division, and brigade fire support elements (FSEs) and attack aviation regiment/brigade/battalion TOCs. A notional picture of how JTAGS-provided TBM launcher location is utilized in attack operations is shown in Figure 3-2.

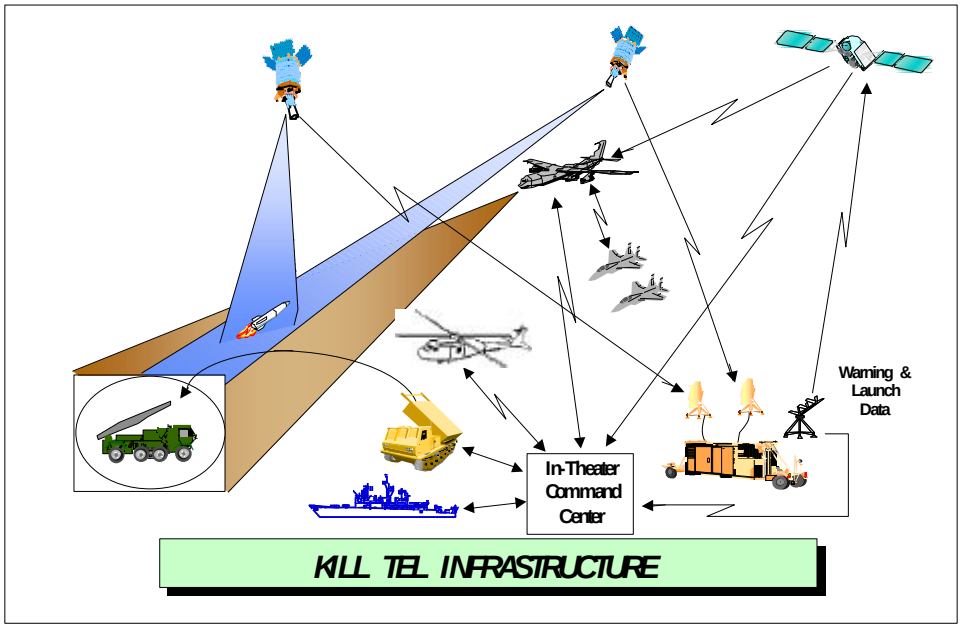


Figure 3-2. Attack Operations

ACTIVE DEFENSE

3-9. The role of active defense operations is to protect selected assets and forces from attack by destroying TBM airborne launch platforms and TBMs in flight. Active defense includes defense in depth against all classes of TBMs by using all available TMD assets in theater. Defense in depth provides multiple opportunities to negate TBMs with differing capabilities, increases probability of kill, and prohibits the enemy from being able to counter the defensive system with a single technique. It also includes electronic warfare attack to disrupt hostile remote or onboard guidance systems.

3-10. Active defense TMD units (e.g., Patriot) use positional information to initiate radar search actions to acquire TBMs. Army active defense units receive and process JTAGS data warning directly at brigade and battalion TMD task force TOCs primarily from the TIBS and the joint TMD C4I TADIL-J net. The battalion then processes the information and passes it to the lower tier fire unit (battery) level to cue radar search and initiate an engagement sequence as appropriate. TBM task forces receive JTAGS information directly from broadcast networks in order to reduce acquisition and engagement timelines. JTAGS-provided TBM launcher location data is used to provide early detection in active defense operations and is depicted in Figure 3-3.

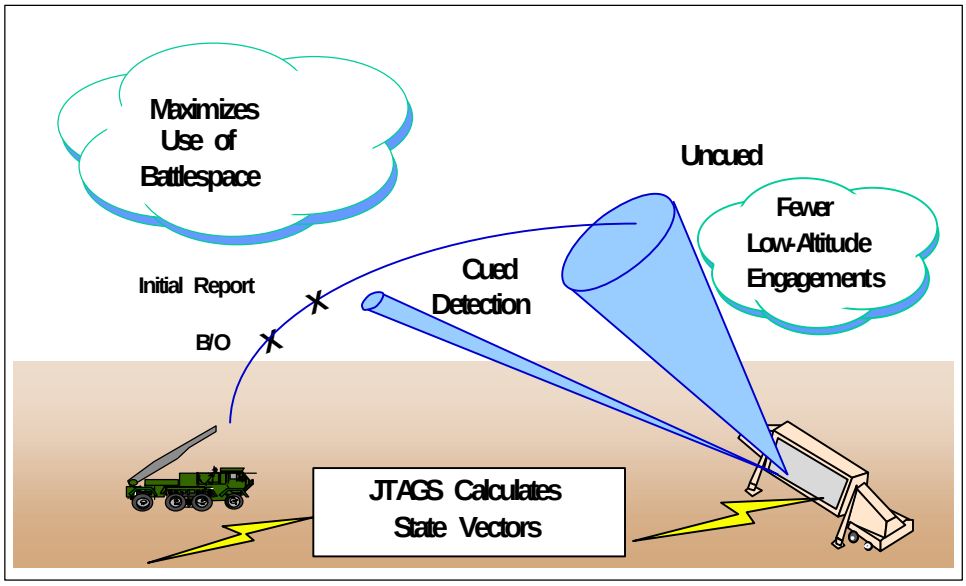


Figure 3-3. Active Defense

COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, AND INTELLIGENCE

3-11. C4I is the architecture and structure that allows the theater CINC and theater forces to manage, coordinate, and conduct integrated operations.

3-12. For TMD missions, C4I is an integrated system of doctrine, procedures, organizational structures, facilities, communications, computers, and supporting intelligence assets. The integration must be accomplished using existing joint and service systems and resources efficiently to ensure integration with other operational functions. The Army's C4I system links passive defense, active defense, and attack operations to provide timely assessment of the threat; rapid dissemination of tactical warning; and mission assignment, targeting data, and poststrike assessment to the appropriate TMD element. C4I capabilities must support the principles of centralized planning, decentralized execution, and coordinated efforts by forces assigned TMD tasks.

3-13. An anticipated application of JTAGS information in the C4I arena is to cue joint srveillance target attack radar system (JSTARS) and other theater intelligence systems with TBM launch point/time information. Such information may, for example, enable these systems to acquire and to track a TBM launcher back to a reload point, hide site, or haven and then pass this new location/target to attack operation elements. Table 3-1 summarizes theater missile defense operational elements.

Table 3-1. JTAGS Theater Support

TMD OPERATION	INFORMATION	BATTLE MANAGEMENT UTILITY
Passive Defense	Launch Warning	Allows personnel to take cover and assume appropriate MOPP.
	Impact Point/Time	Impact area prediction allows warnings to be selectively focused.
Attack Operations	Launch Point	Launch point information with sufficient accuracy and timelines allows sensor hand-offs to support attack operations and intelligence analysis.
	Launch Time	Launch time enables evaluation and selection of appropriate response.
Active Defense	State Vector Launch Time	State vector and launch time would allow active defense system sensors to acquire faster and farther out, thus enabling earlier engagements.
	Impact Point/Time	Impact point prediction supports readiness for specific elements of the active TMD force.
C4I	Support C2 Processes, Situational Awareness, and Intelligence Preparation of the Battlefield by Distributing Event Information	Proper application of C4I enables the commander to selectively apply and maximize his combat power at critical points in time and space on the battlefield to counter the TBM threat. C4 is used to integrate all other elements by: Supporting passive operations; Directing and prioritizing appropriate attack operation activities; Increasing employment effectiveness of active defense elements; Supporting collection missions of other platforms (e.g., JSTARS).

SECTION II ¾ ORGANIZATION OF JTAGS DETACHMENT

3-14. Each JTAGS detachment consists of a small detachment headquarters element and one or more, usually two, JTAGS operational sections based on contingency or operational requirements. A JTAGS section is manned by a warrant officer officer in charge (OIC), operations sergeant, equipment records/parts sergeant, and 12 operators. Crews are multiservice (Army and Navy) with four shifts available for sustained 24-hour operations.

DETACHMENT HEADQUARTERS

3-15. Two detachment headquarters are needed to support two simultaneous major theaters of war. JTAGS is capable of operating 24 hours per day for extended periods only when deployed as a detachment. Each shift consists of a senior operator (crew chief) and two operators. Additionally, each detachment can include support personnel (assigned or attached) to provide for minimal sustaining operations in the event JTAGS is deployed independently of a US support infrastructure, such as in peacekeeping operations.

PERSONNEL REQUIREMENTS

3-16. The JTAGS detachment shown below in Figure 3-4 consists of two sections and a detachment headquarters. Personnel requirements by position and rank are also shown.

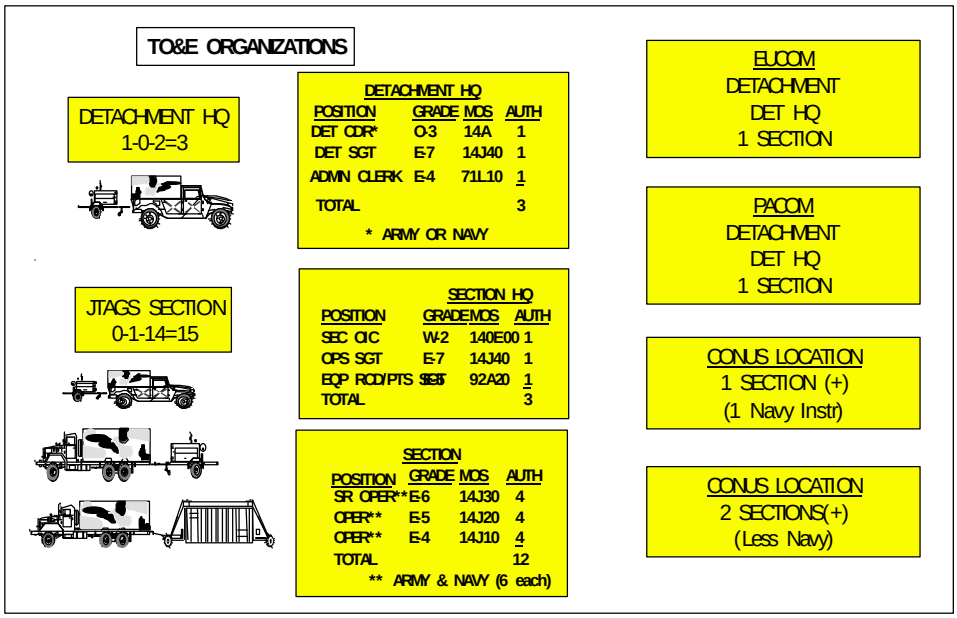


Figure 3-4. JTAGS Detachment Personnel

SECTION III ¾ PERSONNEL

MANPOWER

3-17. The force structure to support JTAGS consists of active duty personnel from the Army and the Navy. Because of joint service manning, there are joint service force structure and training implications for the unit that JTAGS leadership must consider (i.e., deployment differences in permanent change of station and temporary duty; personnel efficiency reports; and physical fitness testing).

PERSONNEL

3-18. Army enlisted soldiers assigned to JTAGS detachments as operators have air defense artillery military occupation specialties. Naval enlisted personnel have an operational specialist, electronic warfare, or intelligence specialist rating.

SENIOR OPERATOR (CREW CHIEF)

3-19. He is responsible for all shift actions and omissions that impact mission accomplishment. The crew chief has message release authority. The crew chief is also responsible for facilitating situational awareness within the theater of responsibility by applying information drawn from daily intelligence summaries to specific areas and periods of interest. The crew chief focuses the attention of the crews and monitors and reports on the status of communication links and the JTAGS system. In event of absence or incapacitation of operators, the crew chief must be able to perform event processing and reporting.

SYSTEM OPERATORS

3-20. System operators interpret and react to TBM warnings displayed on computer-generated console displays. JTAGS internal operations are performed by two operators, each at a work station independently capable of providing either a theater overwatch or "zooming" capability to focus on selected areas of the battlefield (e.g., suspected TBM launch areas). These two operators are also able to monitor independent, but simultaneously occurring events in a large geographic area of responsibility. The area of exploitation for the operators is dependent on the coverage provided by DSP, the location of operations for deployed forces, and the location of enemy launch areas. Each operator position can function independently with common data and communication accesses. The operators can choose to selectively view event data. The operators perform event reviews, validate events as TBM launches, and initiate transmissions of warning information according to theater-established reporting requirements and rules and selected modes of operation. JTAGS can be programmed to operate in an “automatic mode” that sends warning messages without operator intervention.

VOICE REPORTING AND DATA WARNING

3-21. For voice reporting, one operator transmits on the radio broadcast network while the other operator optionally initiates a telephone conference call. These functions can also be performed by the crew chief. Actual voice reporting operations and procedures are based on theater requirements. In data warning, an operator manually releases messages; however, automatic message generation and release are available as an optional selectable mode to handle multiple, near simultaneous launches or as the primary operational mode once missiles have been fired. In the full automatic mode, operators continuously review the situation and manage by exception. JTAGS records DSP sensor downlink data, message outputs, and systems operation, data for postevent analysis, maintenance, and training applications.

SECTION IV ¾ MAJOR ITEMS OF EQUIPMENT

3-22. JTAGS mission equipment is grouped into seven major subsystems: antenna, receiver/decryptor, processor, power, shelter, mobilizer set, and communications. The subsystems are pictured below in Figure 3-5. Equipment dimensions and weights may be found in appropriate technical manuals (TMs).

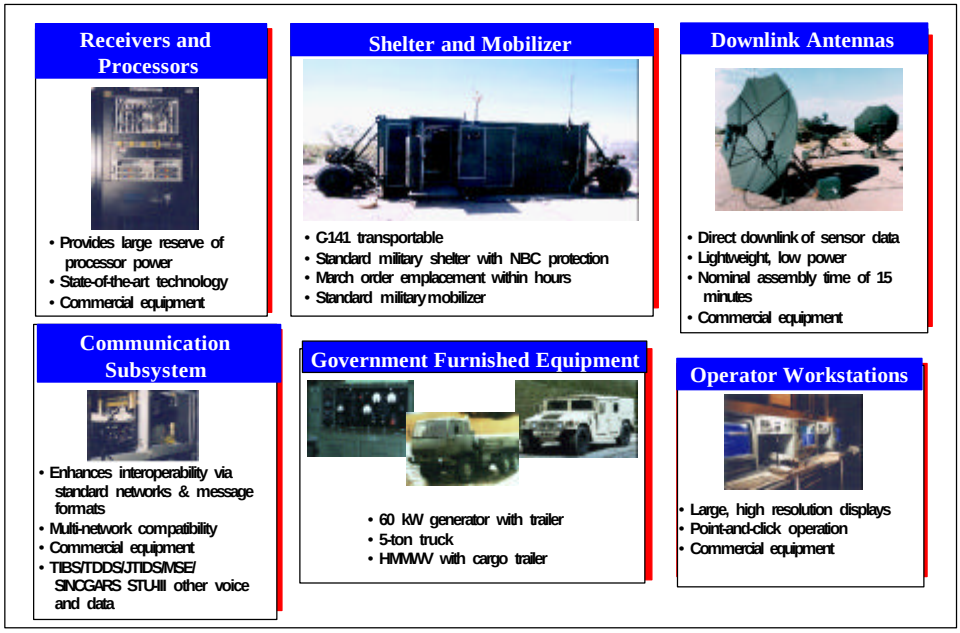


Figure 3-5. JTAGS Hardware

ANTENNA

3-23. The antenna subsystem accepts DSP downlink data streams, converts the data stream from S-band to intermediate frequency (IF), provides radio frequency filtering, and controls antenna switching, positioning, and signal combining.

RECEIVER/DECRYPTOR

3-24. The receiver/decryptor decodes and decrypts data streams and distributes data and timing signals for DSP Link 1 and Link 2 data from up to three DSP satellites (DSP-1 and sensor evolutionary development (SED)). The JTAGS receiver allows global positioning of JTAGS without regard to DSP satellite type or degraded mode of performance. An input from the global positioning system (GPS) provides accurate Greenwich mean time (GMT) and determines the JTAGS unit location and initial antenna pointing reference.

PROCESSOR

3-25. The data processing subsystem includes the data processing hardware and the operational software. The data processing hardware, computers, and peripherals provide the general purpose resources needed by the operational software to detect and report targets from the DSP data. The subsystem is designed with more than 100-percent computer expansion to ensure it can incorporate future TMD requirements. Four computer software components (CSCs) of the JTAGS operational software computer software configuration items (CSCIs) perform the data processing functions.

POWER

3-26. Commercial power, 120/208 volts alternating current (Vac), 60 hertz (Hz), three phase, is the preferred power source for JTAGS. The power unit (PU-805) is a source of electricity for the JTAGS shelter if compatible commercial power is lost or is unavailable in the theater. This is a standard military generator and has not been altered for use with the JTAGS system. The power subsystem provides a reliable, conditioned power source.

3-27. The PU-805 power unit is comprised of an MEP-816A tactical quiet generator (TQG) mounted on a modified 2½ ton, two-wheel trailer (M200A1). The TQG is rated at 60-kilowatt (kW) capacity at 50/60 Hz. The trailer has been modified with generator mounting rails, special fenders, an accessory box, and fire extinguisher brackets. The towing connections for the generator set are standard pintle-hitch air and electrical connectors.

3-28. Emergency power is provided by an uninterruptable power supply (UPS) system that is installed in the shelter. This unit provides emergency power to the computer system for approximately 7.5 minutes in the event of a power failure. The UPS is continually charged by either commercial power or by the PU-805 TQG. When power is interrupted, the UPS provides sufficient power to assure a graceful shutdown of all computers, thus preserving memory and preventing damage to equipment.

SHELTER

3-29. An International Standard Organization (ISO) shelter houses the following JTAGS components:

- Environmental control (air conditioning) unit.
- UPS.
- Three operator workstations.
- Power panels.
- Electromagnetic pulse (EMP) shielding.
- Communication equipment rack.
- Ground, electricity, lighting, and alarms.
- Three operator workstations.
- Data processor equipment or hardware rack.

MOBILIZER SET

3-30. JTAGS is equipped with a mobilizer set that allows the shelter to be towed. When traveling over improved roads, the maximum safe speed is 40 miles per hour.

COMMUNICATIONS

3-31. See Section X of this chapter.

SYSTEM DESCRIPTION

3-32. The shelter contains processing and communication equipment and provides a restricted and protected environment for the conduct of operations. One DSP downlink antenna dish and receiver is required to receive data from each satellite in the JTAGS field of view. A JTAGS section has three DSP downlink antenna dishes and receivers. The above-described assemblage of equipment, together with associated personnel, constitutes a JTAGS section. A detachment's equipment is depicted below in Figure 3-6.

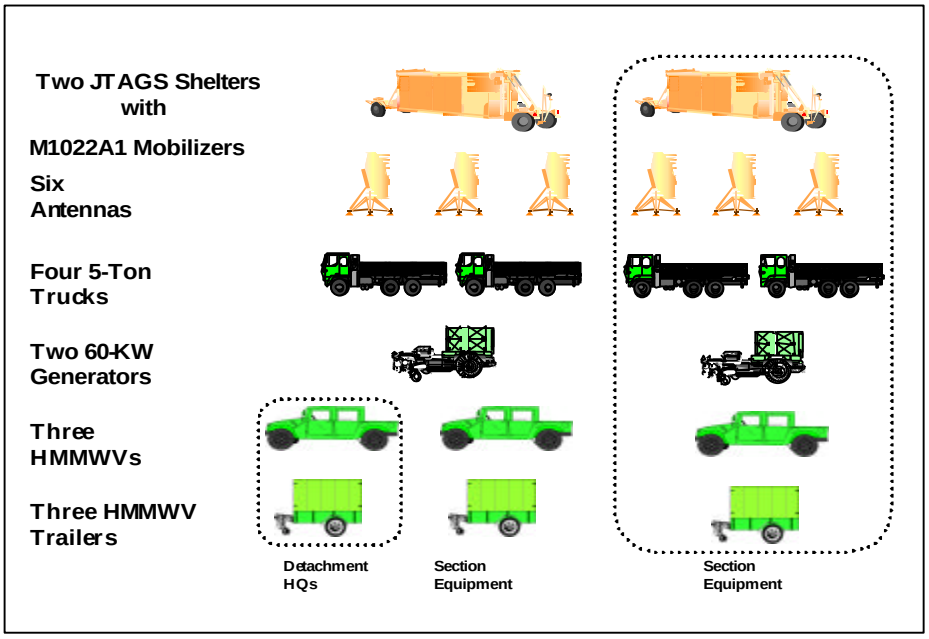


Figure 3-6. Detachment Major Items of Equipment

SECTION V ¾ SYSTEM CAPABILITIES AND LIMITATIONS

CHEMICAL AND NUCLEAR ATTACKS

3-33. Potential adversaries may have the capability to disrupt, destroy, or exploit the JTAGS by either electronic or physical means. The type of enemy conventional weapons used for physical destruction will be dependent upon the geographical location of the JTAGS. JTAGS communication and automation equipment is not vulnerable to chemical attacks except for

possible corrosive effects if surfaces are not cleaned. EMP generated by a high-altitude nuclear burst could cause electronic circuitry damage by entering systems through antennas and unshielded connectors and traveling through entire networks. EMP can damage any electronic equipment that is not properly shielded and could disrupt the data received from reporting satellites.

ELECTRONIC ATTACK

3-34. Additionally, the communication systems used to receive and transmit the information produced by JTAGS will be susceptible to interception, direction finding, and jamming. The sensor downlink receiving antennas integral to JTAGS will be susceptible to radio frequency (RF) interference. A disruption in the flow of either downlink data or output information at critical times would impair the effectiveness of the JTAGS.

SABOTAGE

3-35. The automated equipment, shelters, and support equipment of the JTAGS could be vulnerable to sabotage by enemy agents inserted into rear areas. Human exploitation methods may also target system operators in order to learn about the vulnerabilities associated with the operating system, software programs, or data bases.

WEATHER

3-36. Antenna systems may be susceptible to damage from ice, snow, and water accumulation and are not likely to be protected from the weather because they are located on the ground in uncovered positions.

SECTION VI ¾ CONCEPT OF DETACHMENT OPERATIONS

EMPLOYMENT IN THEATER

3-37. JTAGS sections are expected to be echeloned into theater, but should eventually be employed in pairs as a full detachment. Each of the two sections is capable of independent operations at separate locations within a theater. Both JTAGS sections receive and process DSP data; however, only a single JTAGS will normally be tasked to broadcast voice reporting and data warning information. Actual mission profiles are situationally dependent. Multiple employment options in accordance with (IAW) theater OPLANs provide for a high degree of operational flexibility.

RECEIPT AND PROCESSING OF DSP DATA

3-38. JTAGS receives and processes DSP IR data streams from one or more DSP satellites. The DSP IR data is processed to identify TBMs during missile boost phase and to identify other IR events of tactical interest.

3-39. JTAGS classifies DSP data as TBM launches or other IR events. TBM launch reports are broadcast immediately as an initial warning message

announcing TBM(s) in flight. The initial message includes estimated launch point and time of launch and, if sufficient data is available, predicted ground impact point and time of impact. This message is sent out over all communication means available to and designated by the theater CINC or his designated representative. The Area Air Defense Commander, in accordance with joint doctrine, is responsible for ensuring that allied and coalition forces receive TBM warning. Figure 3-7 displays how DSP satellites monitor their respective AORs for TBM launches and transmit data to the JTAGS.

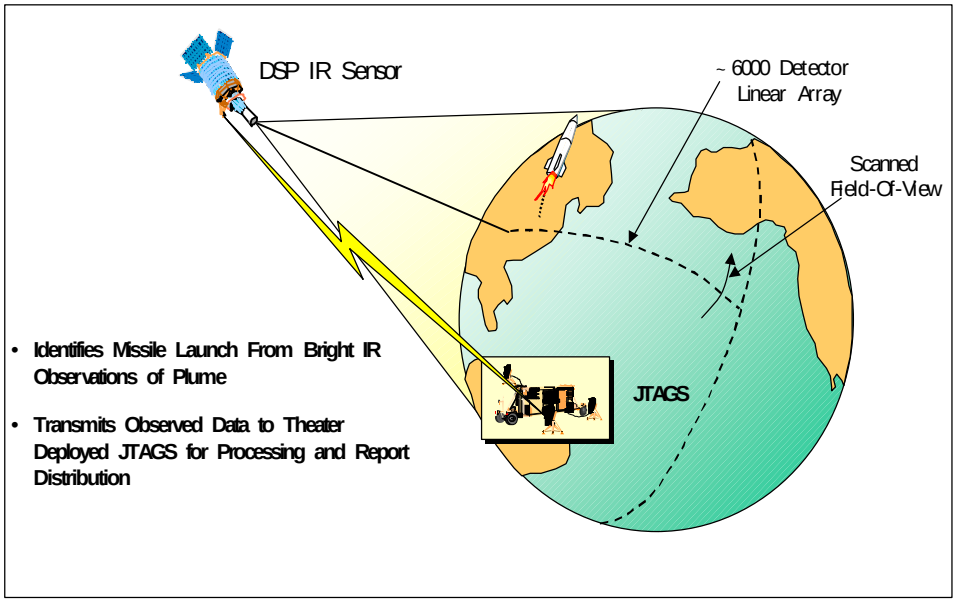


Figure 3-7. DSP Connectivity

3-40. JTAGS continues to receive IR data throughout the TBM boost phase. Based upon this information, JTAGS refines, updates, and broadcasts changed information. Broadcast of update information is accomplished according to reporting rules established by the combatant CINC in coordination with CINCSPACE. The update messages provide positional information for cueing sensor systems and potential correlation of JTAGS trajectory predictions with tracking sensors. Additionally, repetitive broadcasts provide for increased probability of message receipt, alert newly tuned-in listeners on the communication net, and allow for the addition of track amplifying information from other reporting sources.

3-41. At the conclusion of receipt of IR data, TBM messages and message sets containing final predicted ground impact point(s), predicted impact time(s), and state vector(s) are produced and broadcast. Depending on the protocols for the communication systems/networks, a "drop track" message may be sent soon after the final messages are sent.

3-42. Recipients of JTAGS data must perform necessary track data fusion/correlation and trajectory extrapolations. Fusion/correlation of JTAGS data with data from other sensors is not a current JTAGS capability; however, later system improvements could incorporate a fusion capability to

improve accuracy. Figure 3-8 depicts the relationships between strategic and tactical systems that enable the JTAGS to fulfill its mission.

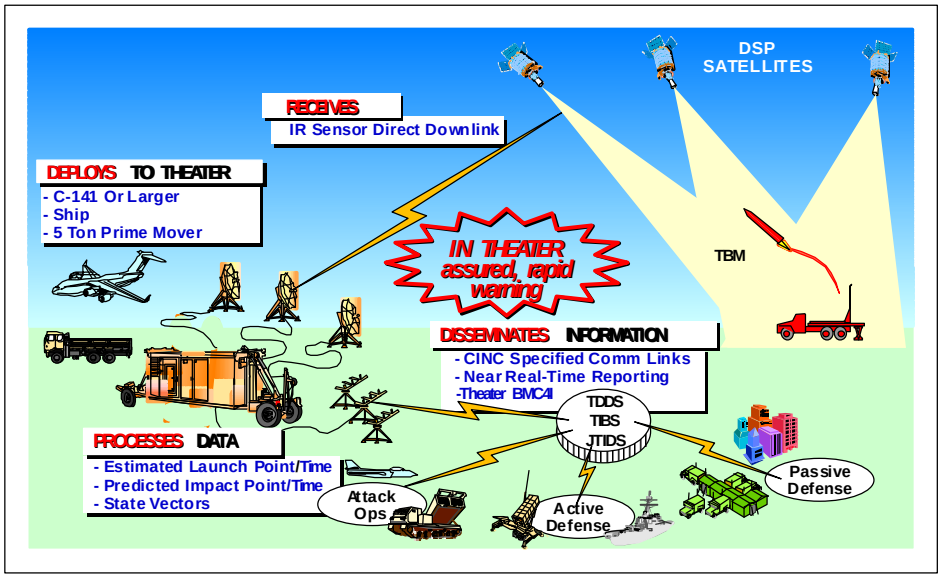


Figure 3-8. JTAGS Concept

SECTION VII ¾ JTAGS MODES OF OPERATION

3-43. The operators use the JTAGS operational software and the operator workstations to set up and control the three JTAGS modes of operations. The modes of operation are: operational mode; analysis, training, and test mode; and maintenance mode.

OPERATIONAL MODE

3-44. During the operational mode, the operator initializes the system and sets control variables such as area-of-interest (AOI) definition, BM/C4 nodes, communication interfaces, and automatic and manual report release. The operator then controls the manual and automatic operations of JTAGS. The operator's key objectives are (1) to validate the IR target detections in the designated AOI as TBM launches, IR events of interest, or special events and (2) to initiate transmission of early warning, alerting, and cueing messages in accordance with established theater reporting procedures. The operator also manages the recording of data for future analysis.

ANALYSIS, TRAINING, AND TEST MODE

3-45. During the analysis, training, and test mode, the operator can train by using the JTAGS-embedded training feature or play back recorded or simulated data for analysis, further training, or operator proficiency testing.

3-46. Embedded training allows the operator to operate, monitor, and generate reports by using the JTAGS system with data recorded on tape for training purposes. To operate the system in the training mode, an AOI must be identified and activated. Any current live operations must be terminated. When the training scenario is started and a launch is detected, data is collected automatically. At the end of the scenario, popup data appears for the operator to analyze the event. The training scenario can then be terminated and live operations can continue. Figure 3-9 summarizes JTAGS sustainment training.

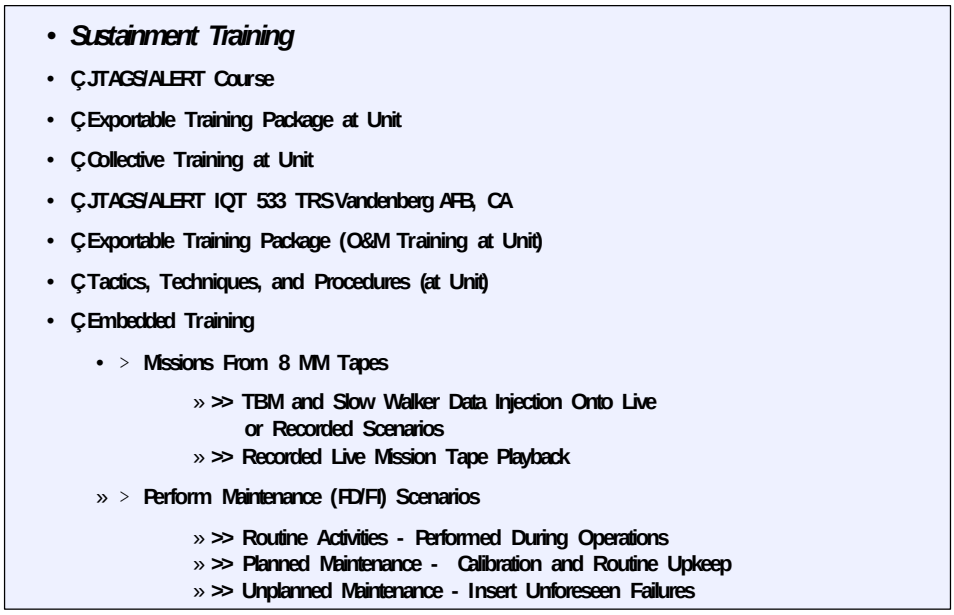


Figure 3-9. Training

MAINTENANCE MODE

3-47. See discussion under FIXING in Chapter 4.

SECTION VIII ¾ DEPLOYMENT

STRATEGIC DEPLOYMENT TO A THEATER OF OPERATIONS

3-48. When considering forward deployments of JTAGS, combatant CINCs request allocation and deployment of JTAGS resources based on the assessed capabilities and intentions of the threat and the probability of tactical missile employment. JTAGS is strategically deployable and can be airlifted to a theater. JTAGS deployments are preplanned and prioritized in the time-phased force deployment list. The location of JTAGS in theater is determined by the theater CINC's needs and is generally influenced by security, logistics, and communication support considerations.

GENERAL PLANNING CONSIDERATIONS

3-49. JTAGS can be operational within 24 hours of arrival in a theater, excluding travel time. JTAGS is not capable of performing its primary functions during transport. JTAGS march order, emplacement, and operate (i.e., into action time) times are consistent with other theater-level tactical support systems.

AIR MOVEMENT

3-50. The JTAGS shelter is certified for transport on C-141, C-17, and C-5 aircraft. The shelter must be lowered to the aircraft floor during flight to relieve the dolly set's hydraulic system of flight-induced stress.

Note: Department of the Air Force, Headquarters Aeronautical Systems Center, Wright Patterson Air Force Base, Ohio, Transportation Engineering Agency (Attn: MTTE-DPE) requires that a copy of the Air Transport Certification of the ESCO M1022A1 dolly set, dated 25 January 1996, accompanies the dolly set each time it is airlifted.

C-141, C-17, C-5 LOAD PLANS

3-51. The C-141 aircraft has a weight limit of 45,000 pounds during peacetime and 58,000 pounds (lb) for wartime. For C-141 transport, the JTAGS and prime mover should not exceed 42,750 lb when loading on the C-141. This allows for additional cargo and equipment to accompany the JTAGS shelter. In peacetime, three C-141s are required for deployment because of weight restrictions. In wartime, two C-141s can deploy a JTAGS section. The JTAGS system has a roll-on/roll-off capability for air movement. Standard K-loaders available for C-141 aircraft are sufficient for handling the JTAGS system. See Figures 3-10 through 3-12 for specific load plans.

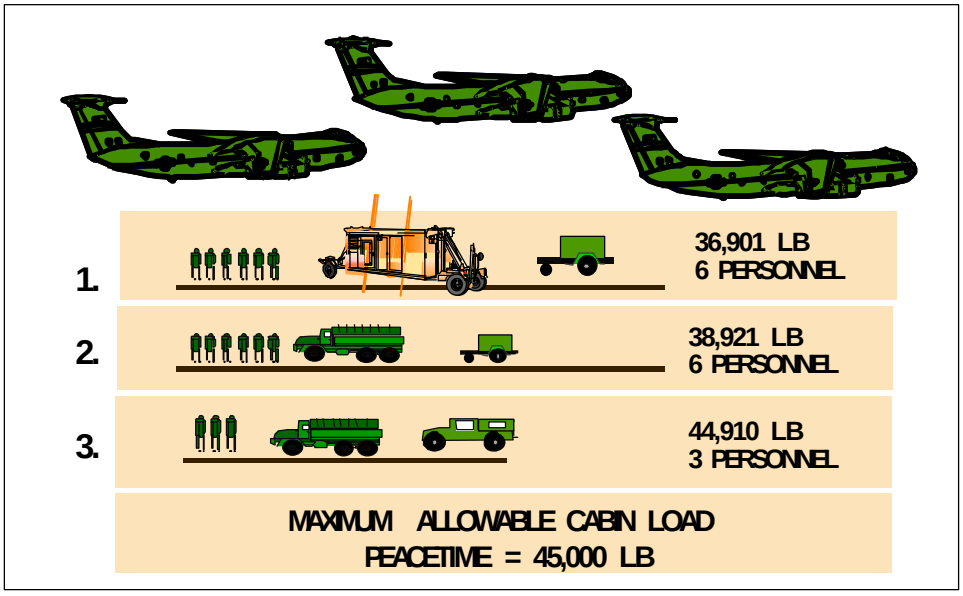


Figure 3-10. C-141 JTAGS Deployment

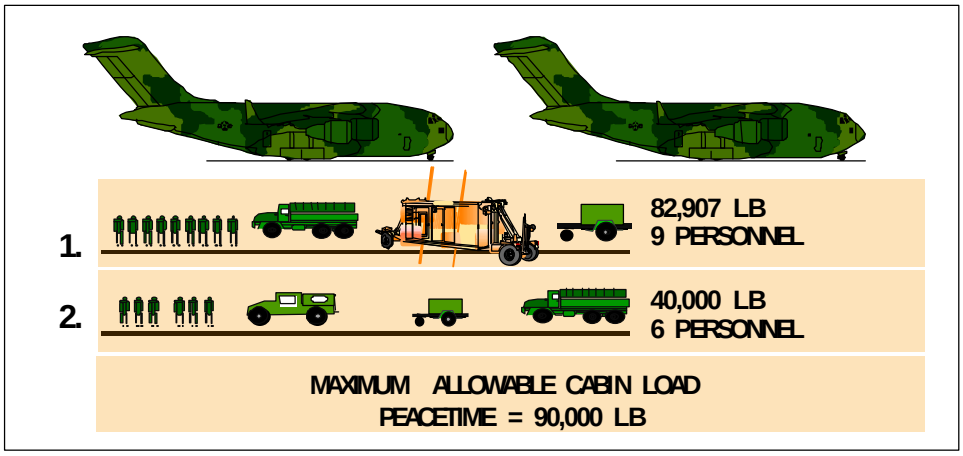


Figure 3-11. C-17 JTAGS Deployment

SEA MOVEMENT

3-52. The S280 ISO shelter is readily transportable by break bulk ships, barge-carriers (lighter aboard ship (LASH) and SEABEE), and roll-on/roll-off ships when loaded on special "flatrack" containers if transport by container ship is necessary. The JTAGS is transportable by the LARC-LX amphibious landing craft, mechanized (LCM-8), landing craft utility (LCU-1466 and LCU-1646), beach discharge lighter (BDL-MKI), and selected deck-cargo barges such as designs 231A, 7001, and 7005.

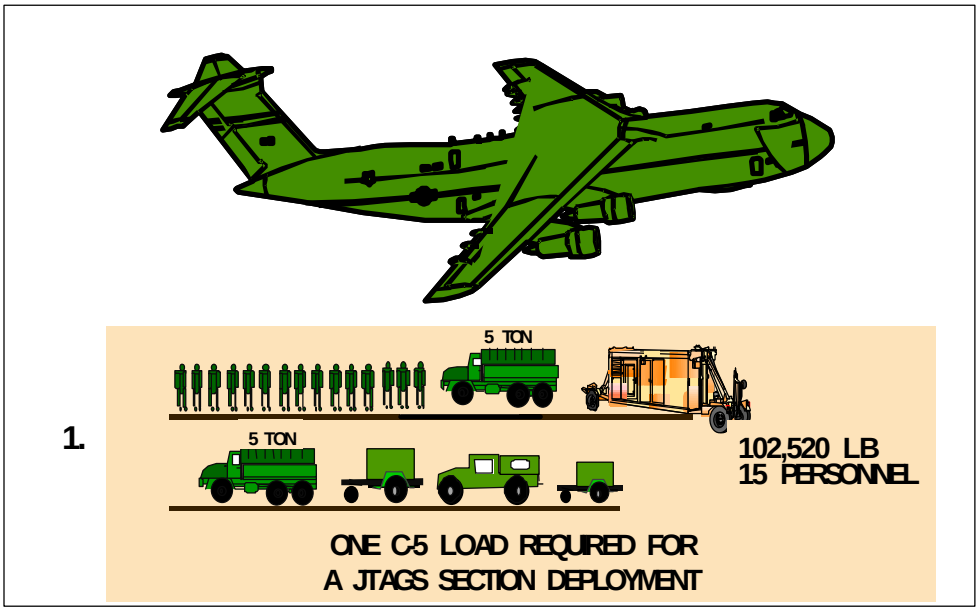


Figure 3-12. C-5 JTAGS Deployment

GROUND MOVEMENT

3-53. The JTAGS ISO shelter is transportable, but not mobile over rough terrain. The shelter is equipped with an M1022A1 mobilizer (dolly set) to transport it. The outrigger jacks are used to level and support the shelter.

MOVEMENT BY TRUCK

3-54. If the JTAGS shelter is moved via commercial highway transport, (i.e., tractor and lowboy trailer), special equipment (i.e., 10-ton crane) may be required to on-load/off-load the shelter.

OVERSEAS HIGHWAYS

3-55. For highway movements, the restrictive feature is the length of the JTAGS shelter and 5-ton truck (71 feet), which makes turning difficult. Additional restrictions are dictated by the size and weight of the prime mover. In Germany, march or movement credits (road clearances) are required and are obtained by the transportation movements officer where the movement originates. Any movement credits that are necessary because of excess width, length, and weight will be obtained through negotiations with the host nations. See the shelter and mobilizer dimensions contained in the JTAGS site preparation information in Appendix B.

MOVEMENT BY RAIL

3-56. JTAGS is neither designed nor approved to be moved by rail.

SECTION IX –¾ SYSTEM OPERATIONS

EMPLOYMENT AND OPERATIONS UNDER NORMAL CONDITIONS

3-57. The mission, enemy, terrain, troops, time available, and civilians (METT-TC) affect employment of JTAGS. JTAGS is also affected by line-of-sight disruptions such as high foliage areas, low takeoff angles, placement in fringe areas of coverage, high usage in small and close areas, susceptibility, destruction, denial, and disruption by an enemy force. For these reasons, JTAGS is generally deployed to echelons above corps (EAC) and positioned in secure rear areas.

SECURITY

3-58. JTAGS collects, processes, transmits, handles, and maintains classified data/information. JTAGS requires host-command support for physical security forces and barrier equipment. Standard Department of Defense (DOD) cryptographic equipment is used. JTAGS mission operations are conducted at the SECRET NORFORN dissemination level. A security classification guide has been produced and is maintained by the JTAGS product office to address JTAGS security and classification requirements.

PHYSICAL SECURITY

3-59. JTAGS requires military police or other security force support for perimeter security and access control. During peacetime operations, access control area lighting should be available. Supported theaters must provide required barrier materials (e.g., concertina) for site physical security. If necessary, JTAGS may be collocated within the secure perimeter of other classified elements as long as other siting requirements are met.

STATION SURVIVABILITY

3-60. JTAGS must be deployed and employed to minimize vulnerability to unconventional warfare and terrorist attacks.

SOLDIER SURVIVABILITY

3-61. The shelter affords some degree of protection from hostile small arms fire, chemical and biological agents, lasers, and natural phenomena. The shelter is ergonomically designed to lessen stress and fatigue that can be brought on during prolonged engagements and combat.

SITE CONSIDERATIONS

3-62. JTAGS does not require any of the traditional site preparation activities (e.g., foundations, pads, revetment, bunkers, etc.) prior to placing it into operation. JTAGS is capable of emplacement on improved and unimproved sites with up to 10 degrees inclination with various surfaces to include gravel, firm soil, grassy areas, light undergrowth, light to moderate snow and ice, pavement, sand, and concrete. For peacetime OCONUS deployments, the gaining command may take additional site preparation measures for placement of the JTAGS in a garrison environment. Additional site preparation information (i.e., shelter and generator size information, power requirements, etc.) is contained in Appendix B.

SECTION X ¾ COMMUNICATIONS

3-63. The information distribution architecture enables JTAGS to rapidly send data warning to users who can effectively utilize the information. Inherent in the implementation of this architecture is the need for some JTAGS recipients to relay or retransmit the information to other organizations. The development of subarchitectures to disseminate warning to the lowest levels is a critical adjunct to the missile warning architecture.

3-64. TBM attack warning and alerting messages have the highest communication precedence available. This means they can and will interrupt and override other transmissions. The communication processor function organic to JTAGS formats the data into messages that conform to the protocols of the communication, dissemination, and processing systems available for the transmission of data warning messages throughout the theater.

3-65. The CINC's OPLAN, operation plan in concept form (CONPLAN), or exercise directive will specify and authorize participation by JTAGS in theater communication networks. The CINC directs establishment of communication networks and designates which networks are to be used by JTAGS to broadcast TBM information. JTAGS contains a suite of organic communication devices to enable independent and autonomous operation and to provide for direct network accesses as needed.

BROADCAST MODES

3-66. Broadcast modes employed for both voice reporting and data warning transmissions provide for rapid, wide area dissemination of TBM warning information. The operators may initiate these broadcasts simultaneously or sequentially. However, data warning transmissions will normally precede voice reporting broadcasts. No acknowledgment of receipt of broadcast messages is required.

DATA WARNING NETWORKS

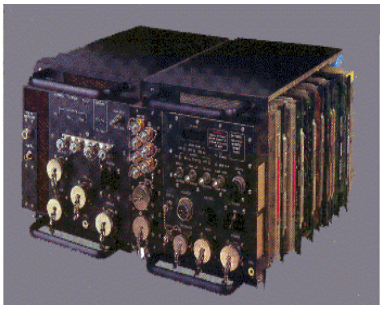
3-67. The tactical information broadcast service (TIBS) and tactical-related applications data distribution system (TDDS) broadcast networks are the primary data warning distribution means employed by JTAGS. TIBS allows JTAGS to distribute TBM information directly to TIBS subscribers. The TIBS network provides a capability to disseminate correlated, time-sensitive tactical information to joint operational users via UHF broadcasts from aircraft or fleet satellite communications (FLTSATCOM). TDDS allows JTAGS to send its information to TDDS subscribers. As the services move to multifunctional receivers and tactical data processors, all equipped users will be able to receive and use both TIBS and TDDS supplied data. See paragraphs 3-77 and 3-78 for additional information.

3-68. An organic commander's tactical terminal-hybrid (three-channel) (CTT-H3), a UHF satellite receiver transmitter, is employed by JTAGS to directly input to TIBS (see Figure 3-13). The CTT-H3 also allows for receipt of TIBS and/or TDDS traffic by JTAGS. Reports received by JTAGS via TIBS/TDDS are used to confirm output transmissions or to receive intelligence information that could enable JTAGS operators to concentrate on specific time windows or locations of probable enemy launches. TIBS can be tasked or queried by specific users. A select number of users have the ability to receive and query the TIBS network, while an unlimited number of users have a receive-only capability.

3-69. The CTT-H3 is a multiservice developed family of special application UHF SATCOM/line-of-sight communication terminals. The terminals can be dedicated to deliver critical, time-sensitive battlefield targeting information to tactical commanders and intelligence nodes at all echelons in near-real time, at collateral and system-high security levels. The terminals are fully militarized for use in combat. The CTT-H3's capabilities are summarized in Figure 3-13.

3-70. The CTT-H3 provides direct, sensor-to-shooter, secure, and dedicated sensor processing facility to C2, connectivity for rapid targeting, threat

avoidance, battle management and mission planning. The terminals can be mounted in fixed- and rotary-wing aircraft, surface, and fixed or mobile ground platforms and vehicles. Using airborne and satellite relay platforms, the terminals provide robust, reliable, jam-resistant targeting and intelligence data and voice connectivity throughout the battlefield. Intelligence data is downlinked to field terminals that interface with operator terminals or user-provided host processors and workstations. The host processor integrates this data with its other functional requirements to format, filter, process, and display threat entities/targets.



CTT/H3

- Ç General Description and Capabilities
  - Transmits TIBS
  - Receives TIBS and TDDS
  - Size: 10.625' H x 10" W x 19.62" D (Two Units - Same Size)
  - Weight 65 lb.
- Ç Mission Impact - Improvements
  - Direct TIBS Transmission and Receipt vs. Via STU-III
  - Direct TDDS Receipt vs. Via STU-III
  - Faster In-Theater JTAGS Data Dissemination to the Warfighter
  - Uses JTAGS Comm Processor (486 PC)
- Ç General Information
  - Frequency Range: 225-400 MHz
  - Channelization: 5 and 25 KHz
  - Primary Power: 100-132 Vac, 47-400 Hz, Single Phase, or 200-400 Vac, 47-66 Hz, Single Phase
  - MTBF: 3000 Hours
  - MTTR: Unit Level NTE 20 Minutes, Intermediate Level NTE 3 Hours
- Ç Additional Support Requirements
  - Network Responsibilities
  - In-Theater Support
  - Maintenance Assistance

Figure 3-13. CTT-H3

3-71. The TDDS allows worldwide reporting on missile events. Connectivity to the TDDS gateway at the CONUS tactical network mission center (TNMC) is required for injection of reports into the TDDS network. The TIBS network provides rapid distribution of data warning reports throughout the theater. JTAGS has an organic capability to uplink directly to the TIBS network. When the joint tactical information distribution system (JTIDS) is fielded, JTAGS will have an organic terminal that will provide a high-speed network connectivity to air defense systems. TBM information contained in data warning messages includes:

- Estimated launch point and time.
- State vectors.
- Estimated impact point and time.
- Other missile information.

JTAGS communications interoperability is depicted in Figure 3-14.

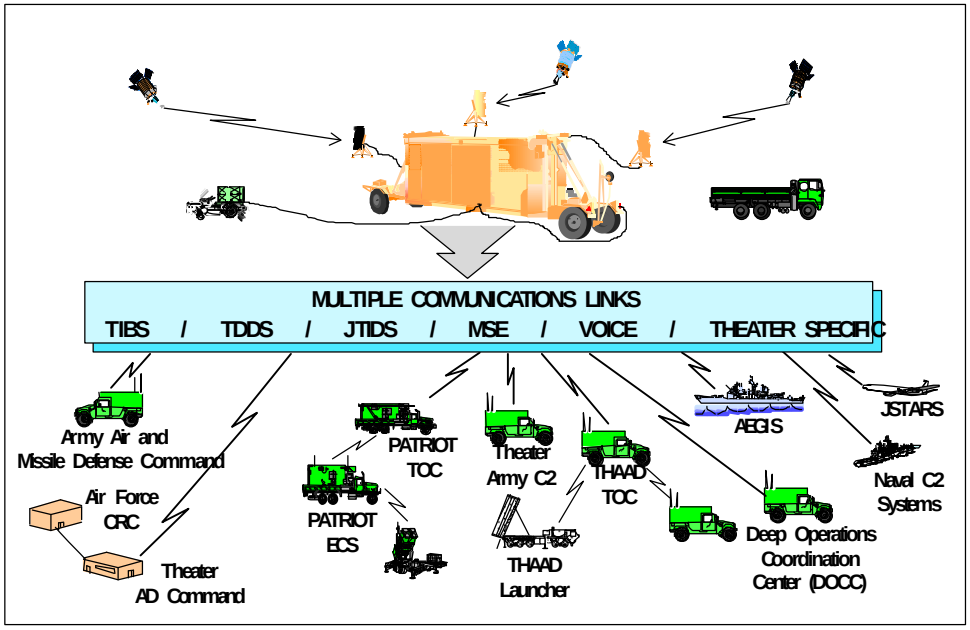


Figure 3-14. JTAGS Interoperability

VOICE REPORTING

3-72. Voice reporting of missile launches is provided from the JTAGS shelter or from a designated theater C2 element. Voice reporting may be over UHF SATCOM nets, tactical radios, or landlines. The JTAGS forward-deployed status allows each theater to customize voice-reporting procedures. JTAGS may also be tied to other theater data via hardwire and common-user voice networks in accordance with theater requirements and procedures. Voice reporting networks include the first detect/first report conference call with the theater event system and theater users; execution, warfighting, or other theater warning conference net calls including UHF early warning nets; very high frequency (VHF) inter-shelter and other command, administrative, logistic, or coordinating nets.

SECTION XI ¾ CONNECTIVITY REQUIREMENTS

VOICE LINKS

3-73. JTAGS requires three connections to some combination of multisubscriber equipment (MSE), triservice tactical communications (TRI-TAC), Defense Switching Network (DSN), or commercial phonelines for mission and administrative voice support. JTAGS mission warning may be integrated into any or all of the following radio networks: UHF SATCOM, UHF terrestrial, JTIDS, and frequency modulated (FM). These lines are used for mission voice reporting; followup reporting and coordination with the theater, MWC-T, USARSPACE, and other TES elements; and administrative voice communications.

DATA WARNING LINKS

3-74. JTAGS must be designated as a data provider on the theater TIBS network and also allocated a TIBS identification number by the theater TIBS master control station. JTAGS is able to uplink directly to TIBS, but a landline link to a backup TIBS uplink point is required. Primary and backup landlines must be established to TDDS TNMC. Additional landlines are required for the serial link interface protocol (SLIP) data connection, a JTAGS remote terminal (if required), and a backup data line. Required voice and data lines are summarized in Figure 3-15 and notionally depicted in Figure 3-16.

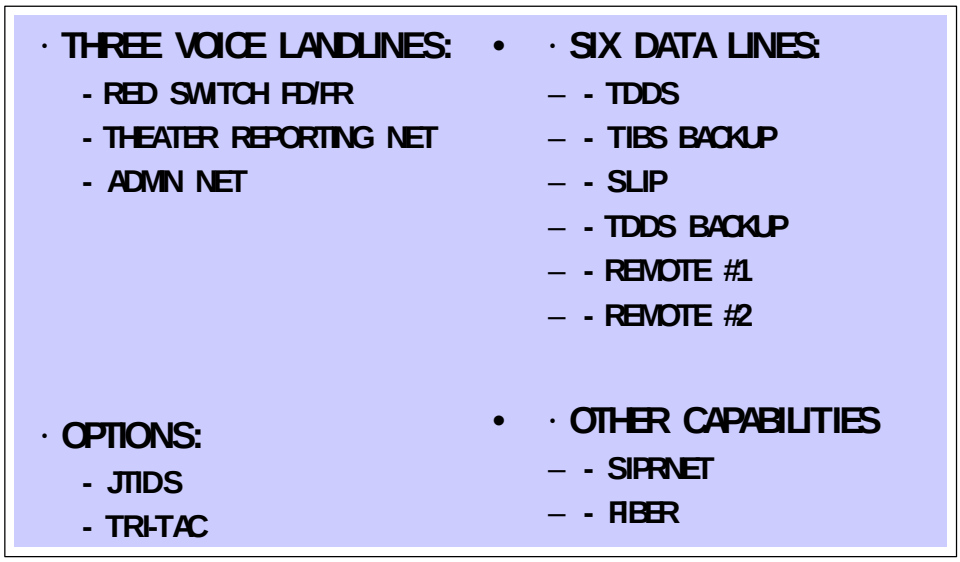


Figure 3-15. JTAGS Communication Requirements

SECTION XII – REPORTING

CLASSIFICATION AND BROADCASTING

3-75. The JTAGS system classifies track data as TBM launches or other IR events. TBM voice reporting and data warning reports are broadcast immediately as an initial warning message announcing TBM(s) in flight. The initial message includes estimated launch point and time of launch and, if sufficient data is available, predicted ground impact point/time. This message is transmitted over all communication means available to and designated for JTAGS distribution of TBM information.

MESSAGES AND REPORTS

3-76. Upon receipt of IR data on TBMs, messages and message sets containing final predicted ground impact point(s), predicted impact time(s), and state vector(s) are produced and broadcast. Users of JTAGS data

warning reports perform necessary track data fusion and correlation and trajectory extrapolations. A discussion of data warning transmissions, reports, and communications follows.

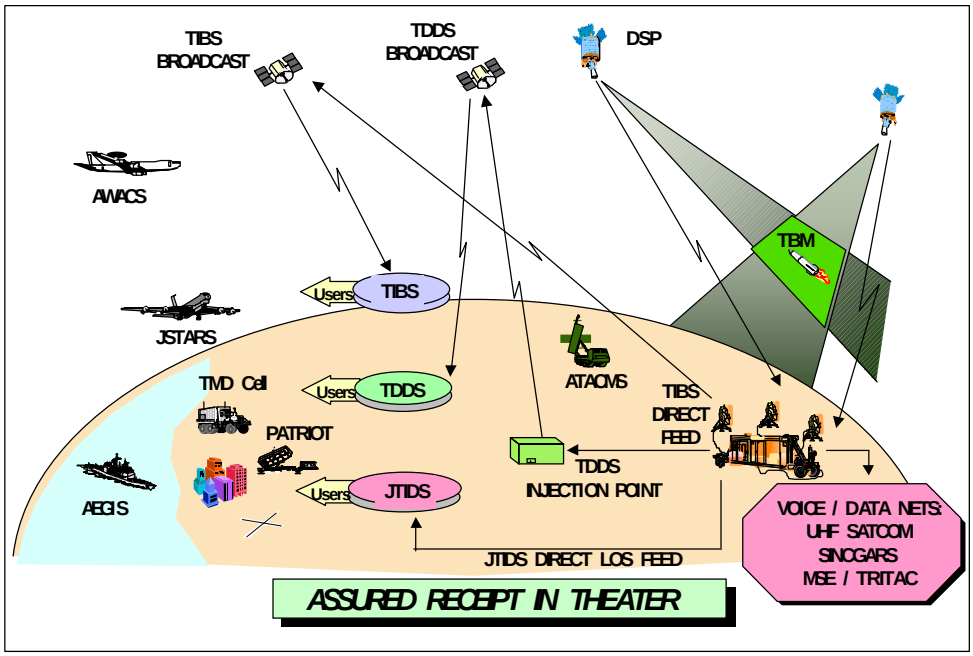


Figure 3-16. JTAGS Communications

TACTICAL INFORMATION BROADCAST SERVICE

3-77. TIBS reports are broadcast periodically, followed by updates, new data, amplifications, or deletions. Users can set filters in the CTT to reduce the volume of messages forwarded to the host workstations based on specified parameters, including geographical interest areas, altitudes, specific targets, collection parameters, etc. The Air Force Intelligence Command, Kelly Air Force Base, San Antonio, Texas, is the lead agency for TIBS development.

TACTICAL-RELATED APPLICATIONS DATA DISTRIBUTION SYSTEM

3-78. TDDS collects information from multiple sources and disseminates through a UHF SATCOM broadcast to tactical users. TDDS provides global surveillance information for sensor cueing and for integration into data bases at the various field receiver locations. Data warning is forwarded from sensor to processor to communications gateway and relays to one of the FLTSATCOM broadcast satellites for dissemination to worldwide military users. Data warning is transmitted twice to attain a statistical 99-percent guarantee of delivery. The Defense Support Project Office, Washington, DC, is the lead agency for the TDDS broadcast. Each service maintains a program office responsible for the development, deployment, and employment of its TDDS reception and exploitation devices.

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM / TADIL-J

3-79. JTAGS has the capability to input information directly by organic radio or indirectly by interface to nonorganic radio into a theater joint TMD data warning network established specifically to support joint TMD operations and to share TMD information. This network is currently under development by the Ballistic Missile Defense Organization (BMDO) and is envisioned to be JTIDS/TADIL-J supported by an airborne relay. Since JTIDS is not an Army area common-user system, and consequently not normally available at supporting area communication nodes, JTAGS employs an organic JTIDS radio to achieve and assure access to this network. A representation of the JTAGS organic communications is shown in Figure 3-17.

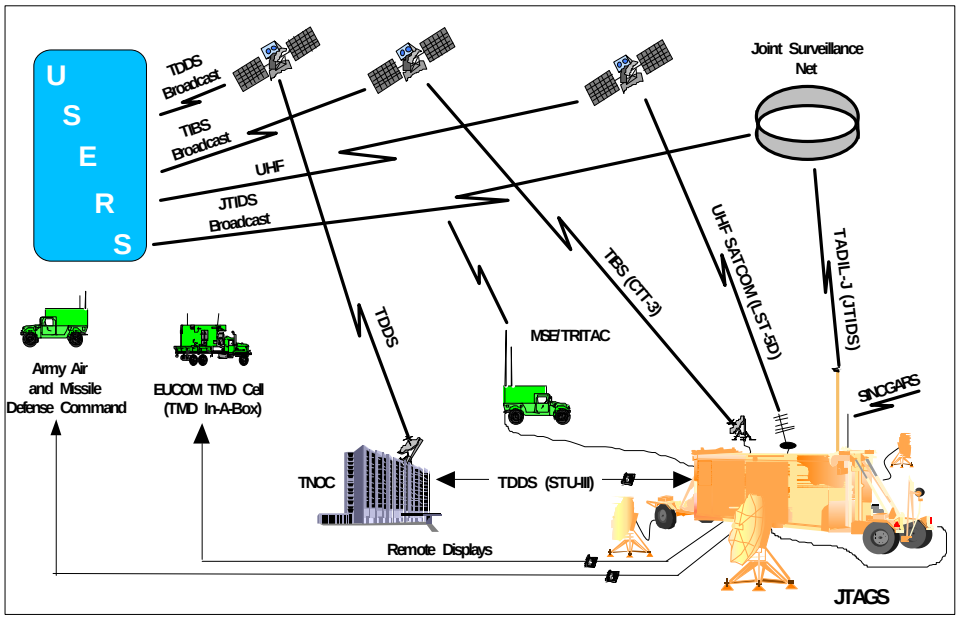


Figure 3-17. JTAGS Communications

VOICE REPORTING NETS

3-80. JTAGS has the capability to operate in voice reporting nets established by the CINCs. These nets are expected to be served by SATCOM because the traditional frequency modulation and amplitude modulation tactical networks are not normally employed at the higher echelons of a joint task force. An organic UHF single-channel SATCOM radio is used to enter specified theater voice nets, if so allowed and authorized.

SECONDARY NETS

3-81. JTAGS requires access and interfaces to other theater communication systems to provide secondary and parallel information distribution routes. Depending on the situation, JTAGS could employ a high precedence conference call to warn a preselected and predetermined set of high priority subscribers. The conference call method would allow JTAGS operators to verify that critical broadcast messages have been received. JTAGS has the capability to transmit character-oriented messages directly to addressed

command centers and/or tactical command and control system entry and interface points. Theater communication systems provide access points to long-haul communication systems and enable JTAGS to exchange non-real-time information with CONUS-based or out-of-theater support and coordination elements.

Chapter 4

Service and Support

This chapter provides the doctrine for the combat service support (CSS) for JTAGS detachments and sections. CSS is the essential capabilities, functions, activities, and tasks necessary to sustain all elements of operating forces in theater at all levels of war. CSS elements are organized to support military forces by manning, arming, fueling, fixing, moving, and sustaining soldiers and their systems.

GENERAL PLANNING

4-1. Logistic support for JTAGS nonspecific (Army common) items is provided to fielded units through the Army maintenance system and the Army supply system via the unit level logistics system – ground (ULLS-G). The supply and maintenance policies set forth in AR 710-2 and AR 750-1, respectively, will be followed.

4-2. Contractor logistic support (CLS) will be used for JTAGS peculiar equipment. Employment of civilian contractors on the battlefield involves many considerations and risks. As this field manual goes to press, a 715-series Army regulation and a 100-series Army field manual are in the development process. When published, these two documents will provide doctrine and guidance for commanders and staff planners. Responsible individuals should review and incorporate their requirements when they are published. The logistic support concept has two levels: organizational and depot (CLS). The logistic assistance representatives (LARs) provide technical assistance to JTAGS units. The LARs are part of the maintenance concept and interface between the supported units, Aviation and Missile Command (AMCOM), and the contractor. Maintenance and supply concepts are summarized in Figure 4-1.

COMBAT SERVICE SUPPORT

DETACHMENT CSS RESPONSIBILITIES

4-3. The responsibilities listed in the succeeding paragraphs are not extensive, nor are they all-inclusive. The lists are intended only as broad guidelines and starting points from which the leaders of the detachment and sections can begin to assign the work of running the unit.

DETACHMENT COMMANDER

4-4. Detachment commander responsibilities are to:

- Exercise overall supervision and control of detachment CSS functions and systems.

- Continually review CSS requirements.
- Assign CSS responsibilities to detachment and section personnel.
- Participate in site surveys.
- Establish standard operating procedures (SOPs) for CSS functions (e.g., maintenance, supply, personnel management).

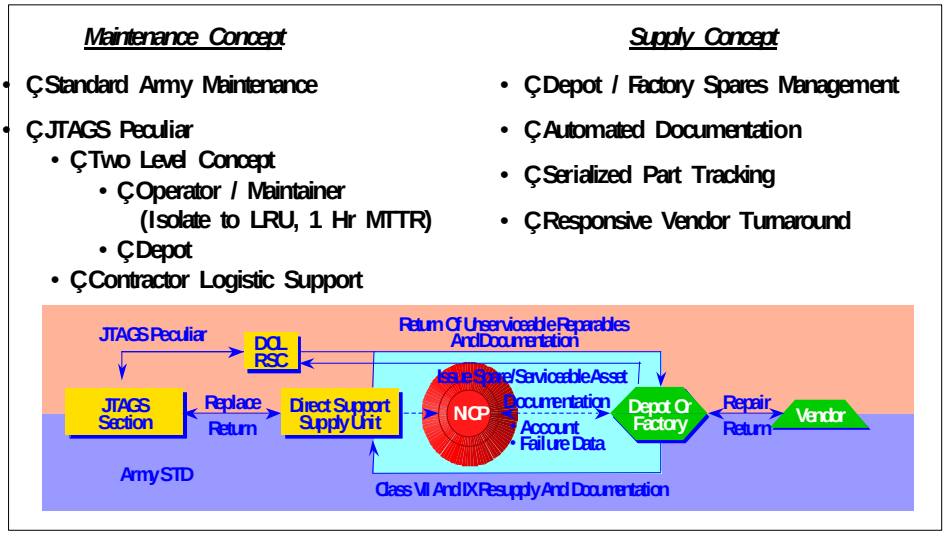


Figure 4-1. Logistic Concept

DETACHMENT SERGEANT

4-5. The detachment sergeant coordinates soldier sustainment and supply support for assigned Army and Navy personnel.

SECTION WARRANT OFFICER

4-6. Section warrant officer responsibilities are to:

- Exercise supervision and control of section CSS functions and systems.
- Perform duties as section and detachment maintenance officer and maintenance technician.
- Participate in JTAGS site surveys.
- Assign CSS responsibilities to section personnel as appropriate.

SECTION OPERATIONS SERGEANT

4-7. Section operations sergeant responsibilities are to:

- Perform the same CSS functions as the detachment sergeant when the section is deployed separately from the detachment headquarters.
- Supervise the efficient and effective accomplishment of section maintenance and support tasks.

SECTION EQUIPMENT RECORDS AND PARTS SERGEANT

4-8. Section equipment records and parts sergeant responsibilities are to:

- Know both prescribed load list (PLL) and the Army maintenance management system (TAMMS) procedures.
- Maintain current copy of appropriate supply, maintenance, and other publications.
- Maintain JTAGS peculiar PLL in accordance with appropriate regulations, procedures, and JTAGS system technical letter.
- Submit requisitions to CLS depot for JTAGS peculiar items in accordance with appropriate regulations, procedures, and JTAGS system technical letter.
- Submit requisitions through the supported unit for standard items.
- Follow up requisitions as required.

SUPPLY

4-9. Supply includes the acquisition, storage, care of materiel in storage, distribution, and salvage of supplies. It also includes the determination of kind and quantity of supplies. Supplies consist of all items necessary for equipping, maintaining, and operating a military command. Supply support that includes installation retail supply and storage operations is used in support of a JTAGS detachment or section. Supply support consists of a JTAGS peculiar PLL, which is maintained by the JTAGS section, and common or standard items, which are requested through the supported unit. JTAGS peculiar components will use CLS for the life of the system. Standard items of a PLL and the initial associated authorized stockage list (ASL) for Government furnished equipment (GFE) are provided to the supporting unit and serviced in theater through the area support group (ASG).

4-10. Supplies needed by JTAGS units in the various classes of supply are listed below. This support is provided by the unit to which the JTAGS is assigned or attached.

- Class I (subsistence) support is required for support 15 personnel per JTAGS section and 3 personnel per JTAGS detachment headquarters (total of 18 personnel for a DET HQ and one section or 33 personnel for a complete JTAGS detachment).
- Class II (clothing, individual equipment tentage, hand tools, sets, kits and outfits, administrative and housekeeping supplies): The JTAGS deploys with all assigned Class II; however, Class II support may be required from the supported headquarters/gaining command for extended deployments.
- Class III (petroleum, oil, and lubricants (POL)): The JTAGS requires fuel support for operating the generator if commercial power is not available. Fuel consumption for the generator is 4.51 gallons per hour.

In addition, fuel is needed for vehicles. Fuel and typical Class III package items are listed in Table 4-1.

Table 4-1. Fuel and Class III Packaged Items

GAA	Diesel Fuel (DS2 or JP8)	Denatured Alcohol
Hydraulic Fluid	OE/HD30	Dry Cleaning Solvent
OE/HD10	DEXRON 4-3	Freon for Environmental
GO 80/90	Deicing Fluid	Control Units
Brake Fluid	Oil, Lubricating Preservative	
Antifreeze	Windshield Washer Fluid	
Dry Nitrogen (99.5-percent pure - required for purging low noise amplifier)		

- Class IV (construction and barrier material) may be required from the supported headquarters/gaining command. Class IV requirements are dependent upon the location of the JTAGS. The amount of concertina wire required is determined by siting conditions.

- Class V (ammunition): The JTAGS detachment/section has 33/15 M9 pistols, respectively. The JTAGS unit requires Class V resupply after depletion of its basic load.

- Class VI (personal demand items): JTAGS personnel deploy with sufficient Class VI items to support themselves for 30 days. After 30 days, Class VI resupply through health and comfort packs and/or Army and Air Force exchange system (AAFES) or commercial facilities are required.

- Class VII (major end items): Each JTAGS section deploys with all assigned Class VII. In the aftermath of catastrophic damage, USCINCSPACE will designate a replacement JTAGS system. Any equipment that is not JTAGS-specific will be replaced through normal logistic procedures.

- Class VIII (medical): JTAGS personnel deploy with their individual first-aid kits and vehicle-aid kits. Class VIII replenishment is required as items are depleted. Replenishment items are obtained from the supporting command.

- Class IX (repair parts): JTAGS deploys with all assigned standard item and JTAGS peculiar PLL. Class IX resupply is required as PLL stocks or other Class IX stocks are depleted and are obtained from the supporting command.

- Class X (materials for other than military operations): Not applicable.

4-11. Standard item supply support for all classes of supply (i.e., from the DOD supply system) during peacetime is IAW established memorandums of understanding (MOUs) and inter-service agreements (ISAs). During

contingency operations, a JTAGS unit will receive organizational supply support for all classes of supply from the command it supports. The JTAGS equipment records and parts sergeant will determine what supplies are needed from the DOD supply system or from local purchase and request those supplies from the supported unit. This supply section will provide these items from their on-hand stocks or requisition the necessary items for the JTAGS through the designated supply support activity (SSA). Requisition procedures are detailed in Figure 4-2. The equipment records and parts sergeant will follow up requisitions IAW procedures outlined in Figure 4-3.

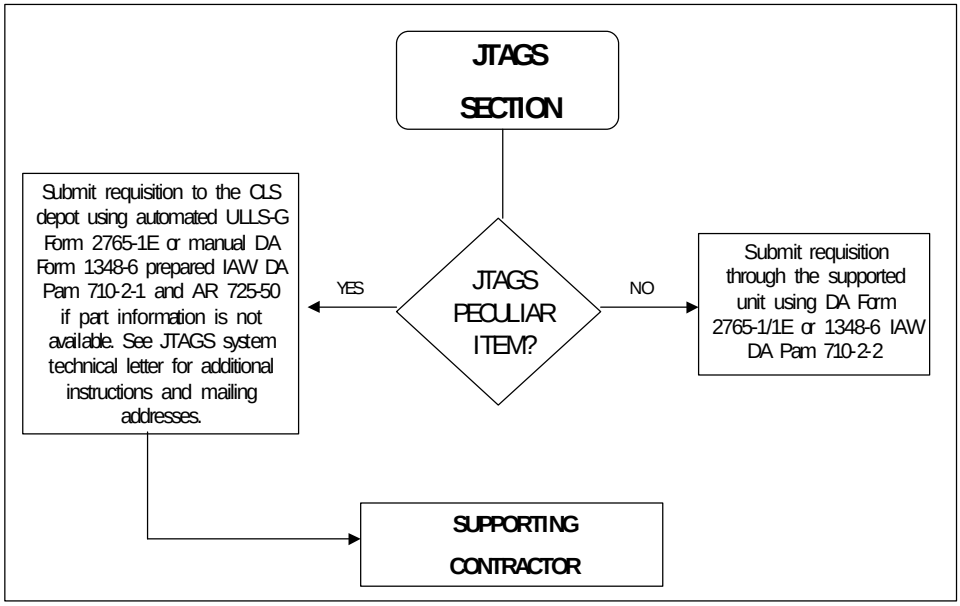


Figure 4-2. Requisition Flow

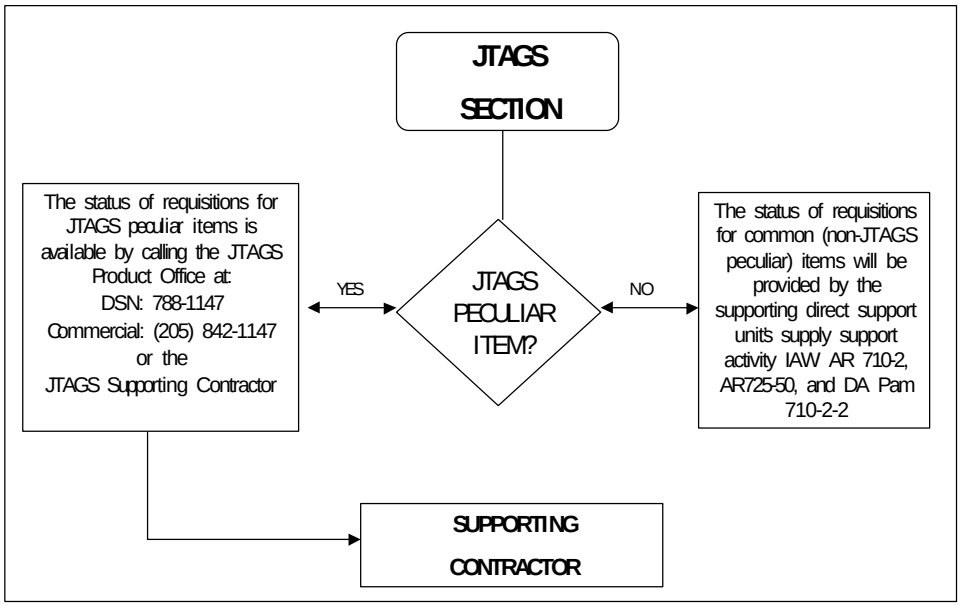


Figure 4-3. JTAGS Requisition Status Flow

FIXING

4-12. Fixing includes all actions necessary for retaining or restoring an item to a specified condition. It includes inspecting, testing, servicing, classifying as to serviceability, repairing, and rebuilding. Equipment maintenance support that includes equipment maintenance, repair, and calibration is required in support of the JTAGS section or detachment. Appropriate support is required from the theater communications security (COMSEC) account.

4-13. The maintenance mode of operations includes both scheduled and unscheduled maintenance. When unscheduled maintenance is required because of a fault, the operator uses diagnostic procedures and the JTAGS built-in test/built-in-test equipment (BIT/BITE) capability to isolate the faults to the line replacement unit (LRU). Scheduled maintenance is performed according to the procedures in the Operation and Maintenance Technical Manual (TM 9-5895-616-12&P-1, P-2).

4-14. During peacetime operations, a JTAGS section requires maintenance and training time that is coordinated through ARSPACE, USSPACECOM, and approved by the theater in which it is deployed. During this period of time, other TES elements assume responsibility for providing coverage.

4-15. The integration of BIT and manual test capability and the degree of test automation incorporated are such that JTAGS meets the availability and mission reliability requirements using only the operator personnel authorized in the JTAGS table of organization and equipment (TOE). On-site maintenance consists of fault isolation, replacement of LRUs, replacement of selected LRU components and subassemblies, verification testing, installation of equipment modifications, calibration certification of mobile/fixed test equipment, and preventive maintenance.

4-16. In a wartime scenario, if only one JTAGS section is providing theater coverage, the ALERT system will provide backup coverage during maintenance and training periods. If two JTAGS sections are in theater, one section will be designated as primary and the other as secondary and a handoff will occur between the sections. In the event that both systems are unable to provide coverage, the ALERT system will provide coverage.

4-17. Maintenance and training periods are scheduled by the detachment commander and NCOIC in accordance with guidance set forth in approved Army Space Command maintenance standard operating procedures.

4-18. Maintenance request procedures for sustainment of JTAGS elements during operational deployments is IAW the detachment maintenance checklist, which addresses both Army standard equipment and JTAGS peculiar equipment.

4-19. Army standard equipment in the JTAGS section or detachment is maintained through the organizational support element of the supported unit and through the DSU and other support units and assets in the JTAGS area of operation. An advance party of HQ USARSPACE and JTAGS detachment/section personnel will coordinate support, establish maintenance

accounts, and conduct other preliminary coordination prior to the main element's arrival. In accordance with the JTAGS deployment plan, the JTAGS element should have in their possession on arrival an ULLS-G generated diskette with the JTAGS equipment information. This disk is to be provided to the supporting DSU on arrival. In locations where ULLS-G is not used, the JTAGS personnel will conform to local maintenance SOPs.

4-20. Depot maintenance operations support both the combat forces and the Army supply system. DSU maintenance operations will repair all non-peculiar (i.e., standard) JTAGS equipment faults at and above organizational level. Equipment will be evacuated to higher echelons for maintenance as required in accordance with support agreements.

4-21. Standard item maintenance support during peacetime is IAW established MOUs and ISAs. During contingency operations, JTAGS will receive organizational maintenance support from the unit to which they are attached for support.

4-22. JTAGS operators perform preventive maintenance checks and services (PMCS) on Army standard equipment and report any faults to the organizational maintenance section of the supporting HQ. This maintenance section troubleshoots the equipment to determine cause of the fault and initiates corrective action appropriate to their level of maintenance. Repairs to equipment that are beyond its maintenance authorization (i.e., direct support (DS) or general support (GS) level) will be coordinated with the DSU. Equipment will either be turned in to the DSU maintenance facility, or DSU contact team support will be arranged (see Figures 4-5 and 4-6). PLL replenishment/repair parts are ordered through normal DSU Class IX supply activity (Figures 4-2 and 4-3).

4-23. The maintenance concept of operations employed by JTAGS for JTAGS peculiar items has two levels: unit and depot (CLS). JTAGS unit personnel have the capability to fault isolate to the LRU using BIT/BITE or test, measurement, and diagnostic equipment (TMDE) procedures. The operator repairs the system by replacement of faulty LRUs. Unserviceable LRUs are evacuated to the contractor for repair. GFE is maintained by the designated theater supporting units IAW provisions of existing ISAs and MOUs. Organizational level requirements are summarized in Figure 4-4.

4-24. The JTAGS element has organic personnel capable of performing operator and unit level maintenance on JTAGS peculiar equipment. Higher echelon maintenance is provided via contractor support and is coordinated through the JTAGS element. Contractor maintenance support will deploy to JTAGS locations worldwide to conduct repairs of JTAGS peculiar equipment.

4-25. Equipment operators/maintainers use PMCS to detect early signs of equipment failure (or potential failure) and ensure that faults are corrected before more costly and time-consuming repairs are required. Unserviceable JTAGS peculiar repairable items (properly preserved, protected, and tagged) that are beyond authorized capability or capacity to repair are evacuated to the contractor.

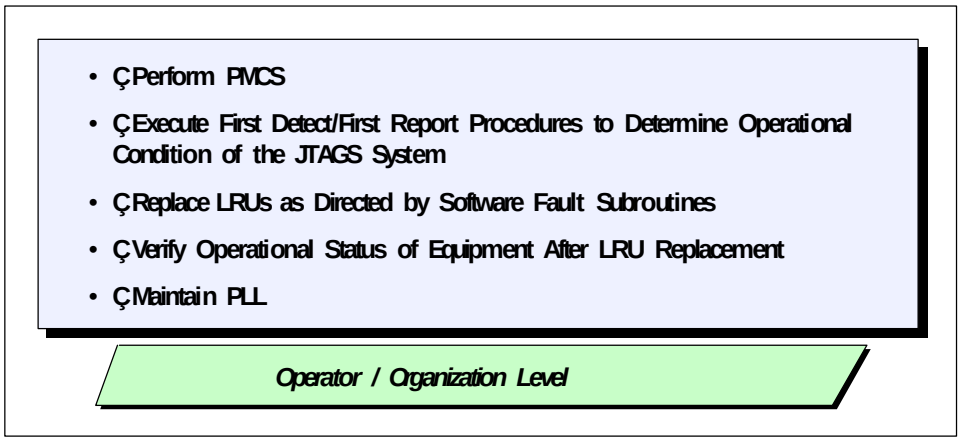


Figure 4-4. JTAGS Operator/Maintainer Support

4-26. The turn-in of unserviceable equipment will be IAW procedures outlined in Figure 4-5.

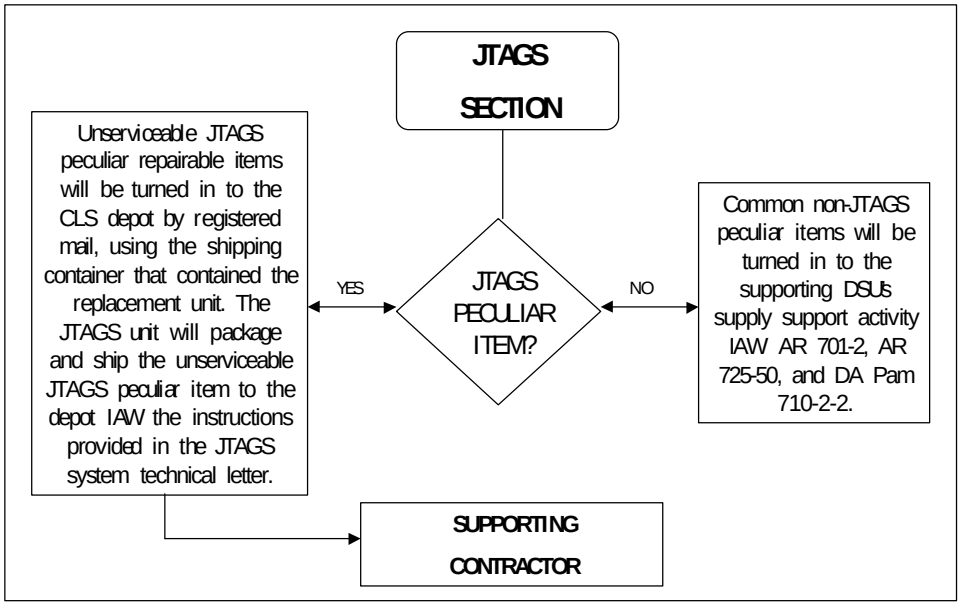


Figure 4-5. Unserviceable Turn-In Procedures

4-27. Prior to deployment, the JTAGS element must obtain pager codes from the supporting contractor, to facilitate maintenance support while deployed. Contractors are required by a conflict clause in their contracts to support JTAGS in wartime operations.

4-28. For support prior to the breakout of hostilities, the JTAGS element will contact the supporting contractor for replacement parts using the pager codes. The supporting contractor will forward replacement parts via government bill of lading (GBL). If GBL is not available, commercial carrier or courier is used. The JTAGS element will ship inoperable parts to the

supporting contractor by using the packing materials in which the replacement parts were shipped.

4-29. In a pre-hostility environment, the JTAGS element contacts the supporting contractor for a replacement part as described in paragraph 4-28. The advance party or detachment commander will determine procedures once established in theater. In all instances, demand history will be maintained.

4-30. If contact team support is required, the JTAGS element contacts the supporting contractor for assistance. The JTAGS Product Office authorizes depot personnel to provide on-site assistance. Details for contacting the depot for contact team support is outlined in Figure 4-6.

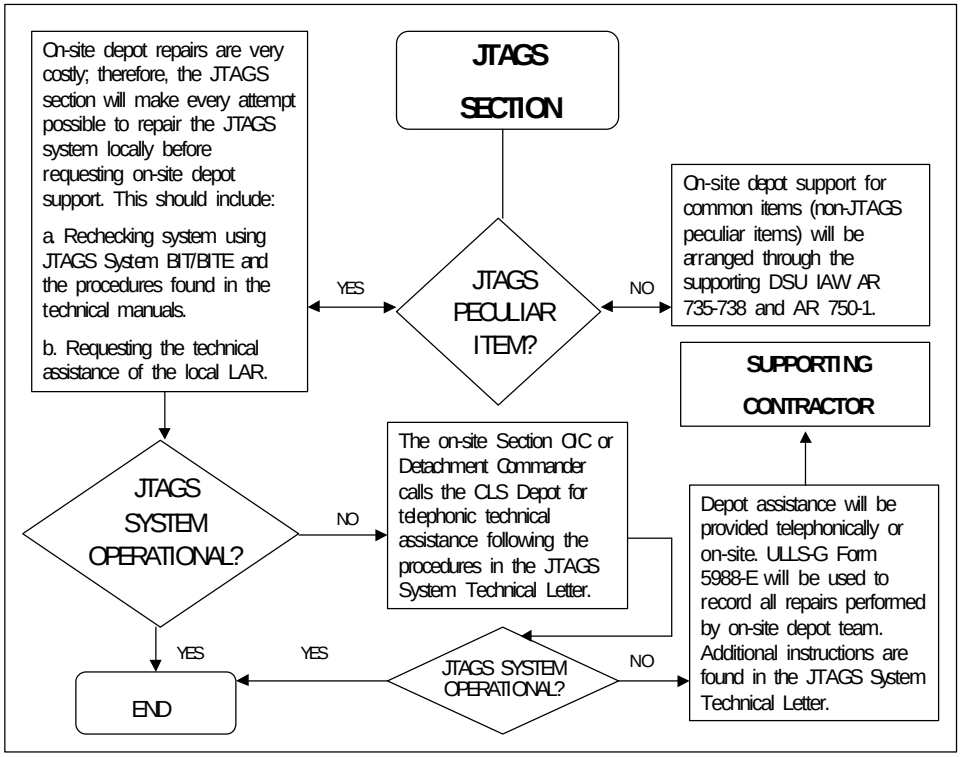


Figure 4-6. On-Site JTAGS Depot Repairs

4-31. Software support is obtained from the supporting contractor's 24-hour telephone technical support. If corrections cannot be made telephonically, the supporting contractor's engineers are required to be deployed within 72 hours for on-site assistance.

4-32. Personnel authorized to make calls and request maintenance and software support for JTAGS equipment are:

- JTAGS Detachment Commander.
- JTAGS Section Warrant Officer.
- JTAGS Detachment NCOIC.

- JTAGS Section NCOIC.

Other individuals (i.e., the equipment records and parts sergeant) may be authorized to request maintenance support at the discretion of the detachment commander based on operational necessity.

MOVING

4-33. JTAGS is capable of tactical movement within theater using organic assets. See Chapter 3, Sections VIII and IX for a complete description of strategic, operational, and tactical movement requirements and capabilities.

4-34. The majority of JTAGS nontactical and administrative transportation requirements are fulfilled using organic assets. Any additional requirements resulting from specific theater considerations must be identified and support negotiated with the host-supporting units through HQ USARSPACE.

MANNING, COMBAT HEALTH SUPPORT, AND FIELD SERVICES SUPPORT

4-35. Support services for JTAGS detachments during peacetime are provided through support agreements with the supported unit. Agreements are established between USARSPACE (FWD) and the supporting units in theater. Modifications to support agreements are made to facilitate mission requirements. Theater support operations include personnel services, combat health support, and field services. Planning for personnel services support must include services for naval personnel who deploy as part of the detachment. Peacetime support coordinated and provided through the use of MOAs must transition to wartime support as directed in the OPLAN/operations order (OPORD) for the area of operation. The detachment commander and NCOIC are responsible for ensuring that the required coordination with the supported command is accomplished.

4-36. Personnel service support includes social actions, administrative services, military and civilian personnel support, religious support, combat health support, housing and lodging, training, finance, public affairs, legal services, education, and postal services.

4-37. Combat health support includes medical treatment and hospitalization, in-theater medical evacuation, medical regulating, dental services, veterinary services, preventive medicine, and medical consultation.

4-38. Field service support includes laundry, bath, clothing exchange, textile renovation, salvage, decontamination, mortuary affairs, clothing renovation, and post exchange sales.

RECONSTITUTION

4-39. Reconstitution consists of nonroutine actions taken to restore damaged units to a specific level of combat readiness. The nonroutine actions are based on priorities established by the unit commander and result in the

receipt of specified available resources to accomplish the reconstitution mission.

4-40. The JTAGS and supported unit commanders have two reconstitution options available to return the JTAGS to a specified level of combat capability. Those two options are reorganization and regeneration. The commander can execute them separately, but most often will execute them in combination, depending on current and anticipated situations, command priorities, resources, and time available.

4-41. Reorganization is accomplished within the unit. Reorganization consists of cross-leveling of assets from the detachment or section to form composite teams, sections, or a detachment. Since reorganization is conducted internally, it is the most expedient means of maintaining JTAGS mission capability in the early stages of a conflict and in forward areas throughout the duration of the conflict. It is the option most often executed by commanders.

4-42. Regeneration requires outside support. Regeneration consists of rebuilding a unit by infusing new personnel, equipment, and supplies into a unit and then conducting the necessary training to develop combat effectiveness. Regeneration is the more difficult of the two available reconstitution options. It requires a great deal of outside assistance and a great deal of time for training. Because of the low density of this system, the only resources available for regeneration will be the CONUS-based JTAGS sections. See Class VII discussion in paragraph 4-10.

4-43. The JTAGS detachment commander and key personnel determine the losses in soldiers and equipment. The commander assesses the capability of the unit to function, and the unit forwards the information to the supported commander and USARSPACE.

4-44. The battle damage assessment includes:

- Decontamination needs beyond the capability of the unit.
- Command and control capability within the unit.
- Key personnel and crew capability.
- Status of equipment (standard and JTAGS peculiar).
- Supply status of the detachment or section (standard and JTAGS peculiar).
- Training status in light of casualties incurred.

4-45. The success of the reconstitution effort depends on effective prior coordination between the supported unit staff, JTAGS detachment commander, USARSPACE staff, and theater planners.

4-46. USARSPACE HQ will monitor and provide the following essential information to the JTAGS detachment commander and the supported commander's staff:

- New replacements (personnel and equipment).
- Equipment returned from maintenance.
- Personnel returned to duty status.
- Imbalances of personnel and equipment in subordinate units.
- Status of intransit equipment and personnel.

4-47. Logistic linkup points will be designated for incoming replacement equipment and personnel. Standard equipment will flow through DSU support channels to the linkup point. JTAGS peculiar equipment will flow through the CLS channels to the linkup point. On-site contractor support personnel will assist with the reconstitution effort. Replacement personnel flow through the G1 replacement regulating detachment. Preplanned reinforcements of equipment and personnel may be programmed into the TPFDL. Preplanned CLS equipment and software may be programmed to support contingencies.

4-48. The coordination between the JTAGS chain of command and the supported command is critical. Standardized procedures during exercise should be emphasized. Staff training for reconstitution is usually a low priority; but in reality, reconstitution is a necessary component of sustainment in a wartime environment. The criteria and layout of reconstitution should be addressed in detail in OPLANs because of the low density and unique equipment supported in JTAGS.

SECURITY

4-49. JTAGS security considerations are discussed in paragraph 3-58.

ENGINEERING AND FACILITIES

4-50. Facilities support includes custodial services, entomology services, environmental cleanup and compliance, fire protection, facilities and real property support, utilities, and facility maintenance and repair.

4-51. JTAGS is designed to operate using commercial 60-Hz power as its primary power source. Specific power requirements are identified in Appendix B, Section III. The JTAGS additional authorized list (AAL) provides an authorization for a motor generator-converter, 31.25 kVA, model MCP 31K6633. In a tactical situation when commercial power may not be available, JTAGS is switched to a 60-kW TQG set as the primary power source. Generator support (i.e., maintenance, fuel, supplies, etc.) is arranged through the existing support structure.

4-52. If a sustained operational contingency is planned, steps should be taken by the gaining command to provide facilities to accommodate the detachment headquarters element, shift personnel, and section organic equipment.

4-53. Personnel needs (i.e., dining facilities, living quarters, religious support, and administrative support) are provided by the gaining command.

EXTERNAL COMMUNICATIONS SUPPORT

4-54. JTAGS external communications support and connectivity requirements are described in detail in Chapter 3, Sections X, XI, and XII and include DSN and/or commercial phonelines that are required to support both operational and administrative voice communications.

Appendix A

JTAGS Operations Order

This appendix provides a template for a sample JTAGS detachment or section OPORD. It can be modified for exercises or operations. However, much of the information presented may not be required because of the echelon of command and the amount of detail contained in other annexes supporting the plan. To avoid duplication, refer to the basic operation plan and other annexes addressing space support where possible.

Copy _____ of _____ Copies

DTG:_____

USARSPACE JOINT TACTICAL GROUND STATION (JTAGS) OPLAN _____

References:

Time Zone Used Throughout the Order: ZULU

Task Organization: JTAGS Branch/ARSPACE
Major regional conflict (MRC)-East (E)
MRC-West (W)
CONUS contingency teams (3)

1. SITUATION

a. Enemy forces. See Annex B (Intelligence) or intelligence estimate, and analysis of area of operations if available.

(1) Terrain. List all critical terrain aspects that would impact operations.

(2) Weather. List all critical weather aspects that would impact operations.

(3) Enemy capability and/or activity.

- List known and template locations and activities of enemy units. Information is normally gathered one level up and two levels down.
- List significant enemy maneuver and functional area capabilities that impact friendly operations.
- State the expected employment of enemy assets based on the most probable enemy course of action.

b. Friendly situation.

(1) Outline the plan of the higher headquarters.

(2) List designation, location, and outline of the plan of higher, adjacent, and other functional area assets that support or would otherwise impact the issuing headquarters or would require coordination, and any other supporting the unit.

c. Attachments and detachments.

(1) List attached Navy operators from Detachment E/Navy Space Command, advance party members other than JTAGS personnel, and other personnel or elements attached or detached only as necessary to clarify task organization.

(2) Highlight changes in task organization that occur during the operation, including effective times or events.

d. Assumptions.

(1) Personnel, equipment, and prescribed load list (PLL) are available from the entire JTAGS Branch for cross-level to support the mission.

(2) For deployment of CONUS contingency teams, all required Navy operators are available to support the mission.

(3) ARSPACE headquarters staff is available to support the mission.

(4) JTAGS support requirements are a priority to the receiving theater.

(5) Airlift or sealift is available for the deployment.

2. MISSION

Major regional conflict (MRC)-East, MRC-W and/or the CONUS contingency teams deploy (TBD) to (location) to provide processing and dissemination of tactical ballistic missile cueing, alerting, and early warning in support of (supported CINC).

3. EXECUTION

a. Concept of operations.

(1) JTAGS is the transportable in-theater element of U.S. Space Command's (USSPACECOM) theater event system (TES) and provides theater commanders a continuous 24-hour capability to receive and process in theater, direct downlinked data from defense support program (DSP) sensors in order to disseminate early warning, alerting, and cueing information on tactical ballistic missiles (TBMs) and other tactical events of interest throughout the theater using existing communication networks. JTAGS processes data from up to three DSP satellites to determine launch points, state vectors, and predicted ground impact points for TBMs and ties directly to worldwide and theater communication systems to immediately disseminate this critical information. JTAGS supports all theater missile defense (TMD) operational elements (attack operations, active defense, passive defense, and battle management/command, control, communications, computers, and intelligence (BM/C4I)).

(2) Peacetime/Armistice Operations. One JTAGS detachment headquarters with one section is deployed in Korea (JTAGS-PAC), supporting U.S. Forces Korea (USFK) and Pacific Command (PACOM). One detachment headquarters with one section is deployed in Germany (JTAGS-EUR), supporting European Command (EUCOM) and Central Command (CENTCOM). These forward-deployed JTAGS detachments conduct continuous 24-hour operations in support of their respective theaters and TES. There are two contingency JTAGS sections that train to maintain combat readiness for immediate contingency deployment. The last contingency section is used to support JTAGS individual qualification training. This section can deploy to support a contingency as a secondary mission.

(3) Wartime Operations. In periods of increased tension or active conflict with a chance of tactical ballistic missile activity, two CONUS contingency teams may deploy forward into the theater when requested by the supported CINC and tasked by CINCSPACE. The system(s) currently in theater may remain in place or deploy to another location within theater. Because JTAGS receives data directly from space-based sensors and can use long-haul communications, it is not necessary to actually position a JTAGS within the theater of conflict to provide support. However, the added value of positioning a JTAGS system directly in theater to take advantage of the existing theater communications architecture is critical to assured and rapid dissemination of JTAGS information.

(4) Advance Party. The successful and rapid in-theater reception and integration of JTAGS depends largely on two factors: 1) the maturity of the theater to integrate JTAGS based on a previously conducted advance party site survey, and 2) the successful accomplishment of a current advance party site survey. Either way, the theater must make the reception and integration of JTAGS a priority for successful accomplishment of the JTAGS mission. As soon as a contingency mission appears possible, the JTAGS branch chief will request the theater to authorize an advance party into country and then deploy the advance party. Exact composition of the party will vary depending on previous site survey information and the maturity of the theater's support. Most advance parties will consist of the branch chief and/or a section OIC, communication support contractor, and a DCSLOG logistic representative. Additional members can include a supporting contractor, DCSINT security representative, and other members of the ARSPACE staff depending on theater requirements.

(5) Deployment Sequence.

(a) On notification for deployment, the Army Space Command Center (ARSPCC) or DCSOPS will notify the JTAGS branch chief (or designated representative) who will then activate the JTAGS alert roster and initiate the required n-hour sequence (Appendix 3 (n-Hour Sequence) to Annex C (Operations)). The normal sequence is a 48-hour deployment timeline; however, JTAGS can be prepared to deploy on a 24-hour timeline if required and if airlift is available. The ARSPCC will recall all ARSPACE staff members required to support the deployment.

(b) For deployment of CONUS contingency teams, personnel will recall to support the deployment, regardless of which section is deploying. Additionally, the JTAGS branch chief will notify the Navy Space Command (NAVSPACECOM) JTAGS program officer, NAVSPACECOM Operations Center, or Detachment E of the pending mission and arrange for deployment of Navy operators to Colorado Springs.

(c) JTAGS is capable of deploying by air, land, and sea. However, standard deployment is by air in order to get JTAGS rapidly into theater. The deployment sequence includes the following critical tasks of recalling all personnel, load and march order the deploying section(s), move to the aerial port of embarkation (APOE) and conduct airload operations, fly to the theater aerial port of debarkation (APOD) where the section(s) is met and received by the advance party, offload, stage, march order, road march to the site, emplace, and assume mission.

b. Tasks to subordinate staffs/elements.

(1) Detachment Commanders/Section OICs.

(a) Maintain personnel and equipment to deployment readiness.

(b) Update automated unit equipment list (AUEL).

(c) On alert notification, initiate and supervise required n-hour.

(d) Prepare personnel, vehicles, equipment, and pallets for movement IAW established load plans and directed n-hour sequence.

(e) When CONUS contingency teams are deploying to a theater already supported by a JTAGS detachment, the detachment commander will:

1. Conduct in-theater coordination as directed by the JTAGS branch chief prior to deployment of the JTAGS section.

2. Be prepared to assume command and control of the JTAGS section on arrival.

(2) JTAGS Branch Chief (Director of Operations if Branch Chief is deployed).

(a) On alert notification for deployment of CONUS contingency teams:

1. Initiate the JTAGS alert roster. Monitor recall until all JTAGS personnel are available or accounted for.

2. Alert and coordinate for deployment of Navy operators from Detachment E/NAVSPACE. Receive attachment of Navy operators on their arrival.

3. Brief Commander/ JTAGS-PAC and JTAGS-EUR on the mission and establish any required CONOPS for the mission.

(b) Initiate coordination with required ARSPACE staffs for all n-hour sequence requirements.

(c) Initiate coordination with the theater for mission requirements and advance party deployment.

(d) Establish and deploy the advance party. See Appendix 1 (JTAGS Advance Party Operations) to Annex C (Operations) for detailed information.

(e) Verify time-phased force deployment data (TPFDD) information with the ARSPCC.

(f) Coordinate with USSPACECOM for specific mission requirements including shared early warning (SEW) and first detect/first report (FD/FR) requirements.

(g) Coordinate with the JTAGS Product Office and the supporting contractor for all required contractor logistics support (CLS) to support the deployment and mission.

(h) Maintain and publish the operations plan (OPLAN) and operations order (OPORD) for all contingency missions as directed by the DCSOPS. Provide the base OPLAN/OPORD, Annex C (Operations), Annex J (Command Relationships), and Annex K (Command, Control, and Communications Systems).

(3) Deputy Chief of Staff, Operations (DCSOPS).

(a) On alert notification, initiate recall of JTAGS personnel and essential ARSPACE headquarters personnel to execute the JTAGS deployment.

(b) Brief Command Group and staff on current situation.

(c) Establish and direct a crisis action team (CAT) if required.

(d) Issue OPLANs and OPORDs for all contingency missions. Have the information operations officer provide Annex L (Operations Security) to this OPLAN.

(4) Deputy Chief of Staff, Personnel (DCSPER).

(a) Provide the personnel and medical services portion of Annex D (Logistics) of this OPLAN to the DCSLOG. Assist with other portions as required.

(b) For deployment of CONUS contingency teams:

1. Conduct records review of all deploying personnel to determine level of soldier readiness processing (SRP) and support that is required.

2. Coordinate with logistic support installation for required support to complete SRP of deploying personnel (i.e., medical/dental, legal, finance).

3. Complete all necessary record transactions based on personnel cross-leveling.

4. In coordination with (ICW) JTAGS branch, and the HQ's first sergeant, schedule and conduct the family support group meeting.

5. Coordinate with logistic support installation for chaplain support during deployment operations and for briefings to soldiers and family members as required.

(5) Deputy Chief of Staff, Intelligence (DCSINT).

(a) Brief personnel on any local threat activity as required.

(b) Brief deploying personnel on threat activity (IPB) and security in the theater of operations.

(c) Brief personnel on the environment in the theater of operations (i.e., terrain, weather, etc.) as required.

(d) Brief personnel on subversion and espionage directed against the United States (SAEDA), operations security (OPSEC), signal security (SIGSEC), and essential elements of friendly information (EEFI).

(e) ICW the public affairs officer (PAO), ensure that information released to the public contains no classified or sensitive information.

(f) Be prepared to provide one member for the advance party as required to coordinate security support for the deploying section(s).

(g) Provide Annex B (Intelligence) of the OPLAN to the DCSOPS.

(6) Deputy Chief of Staff, Logistics (DCSLOG).

(a) Determine and report location of APOE/seaport of embarkation (SPOE) and APOD/seaport of debarkation (SPOD) to JTAGS branch chief.

(b) Coordinate transportation requirements for the deployment.

(c) Provide one or more members for the advance party as required to coordinate logistics support for the deploying section(s).

(d) Provide loading assistance and materials to deploying personnel as well as assisting in coordinating/conducting departure airfield control group (DACG) operations.

(e) Coordinate with logistic support installation for pickup of basic load of Class I, meals ready to eat (MREs) for deployment.

(f) Coordinate with logistic support installation for pickup of Class V basic load.

(g) Ensure material handling equipment (MHE) required for packing and loading equipment is available (i.e., forklifts, k-loaders).

(h) For deployment of CONUS contingency teams:

1. Coordinate use of ARSPACE General Services Administration (GSA) and transportation motorpool (TMP) vehicles for transport of personnel to the APOE as required.

2. Coordinate lodging and transportation for Navy operators.

3. Coordinate issue of CTA-50 for deploying personnel, to include Navy operators and contractors.

4. Be prepared to issue/requisition supplies and materials to deploying personnel.

(i) Coordinate with logistic support installation for maintenance contact teams to assist in preparation of vehicles for air loading.

(j) Provide Annex D (Logistics) of this OPLAN to the DCSOPS.

(7) Public Affairs Officer (PAO).

(a) Provide Annex F (Public Affairs) of this OPLAN to the DCSOPS.

(b) For deployment of CONUS contingency teams:

1. Prepare statements for release to the media.

2. Contact local media if and when appropriate.

3. Field all inquiries from media.

4. ICW DCSINT, ensure classified and sensitive information is not released to the media.

5. Provide guidance and brief USARSPACE personnel regarding release of information to the media.

6. Coordinate requirements with local, higher headquarters, and theater PAO officers.

(8) Deputy Chief of Staff, Contracting (DCSCON).

(a) ICW the Deputy Chief of Staff, Resource Management (DCSRM), coordinate with JTAGS Product Office to ensure CLS contract coverage is adequate for the mission requirements including logistics and supporting contractor assistance. Augment if required.

(b) ICW DCSPER, ensure contractors are ready to deploy. Coordinate for contractor visas for the country(ies) of deployment.

(c) ICW the DCSRM, assist the advance party with in-theater procurement requirements.

(d) Provide the contracting and procurement portion of Annex D (Logistics) of this OPLAN to the DCSLOG (if required). Assist with other portions as required.

(9) Deputy Chief of Staff, Information Management (DCSIM) will issue cell phones to the JTAGS OIC and other personnel as directed by the ARSPACE Commander and/or DCSOPS.

c. Coordinating instructions.

(1) This plan is in effect for staff coordination immediately and becomes an OPORD on alert notification.

(2) Commander's critical information requirements (CCIRs).

(a) Priority intelligence requirements (PIRs).

(b) Essential elements of friendly information.

1. ARSPACE standing.

a. What missions/contingencies are being planned?

b. What units have been identified for possible deployment? What is their level of readiness? What are the specifics of their deployment and redeployment (i.e., schedules, routes, modes, destinations, ports, etc.)?

c. What are the capabilities, limitations, and vulnerabilities of USARSPACE (FWD) command, control, communications, computers, and intelligence (C4I) nodes?

d. What personnel actions/activities (i.e., leave, recalls, temporary duties (TDYs), after hour activities at the HQs, and unit mobilizations) indicate changes in the USARSPACE (FWD) readiness posture?

e. What are the single points of failure across the entire communication spectrum that would negatively impact USARSPACE (FWD) mission?

f. What new systems and technologies are being evaluated, fielded, developed, and/or integrated by USARSPACE (FWD), their capabilities, and what resources are required to operate and sustain them?

g. What are the single points of failure for USARSPACE (FWD) supporting infrastructure (i.e., facilities, utilities, personnel, logistic support, resources, equipment, and hardware)?

h. What unclassified technical and operations data (i.e., after action reports, briefings, information papers, financial reports, logistic data, etc.) if compiled may reveal critical sensitive or classified aspects of USARSPACE (FWD) and/or its operations?

i. What are the single points of failure for outsource support (i.e., sole source providers, contractors, key contractor personnel)?

j. Who are the command personnel whose absence would significantly, adversely affect mission accomplishment?

2. Additional JTAGS standing.

a. Specific details about deployment site.

b. Supporting unit during mission.

c. All DSP information.

d. Warning dissemination means and architectures.

e. Additional support equipment.

f. Scheduled and unscheduled down time.

g. All frequencies and codes.

h. Personnel data information.

(c) Friendly force information requirements (FFIRs).

(3) Force protection and risk reduction control measures.

(a) Mission-oriented protective posture (MOPP).

1. All personnel will deploy with complete MOPP equipment including the M40 protective mask with hood and optical inserts (if required), chemical protective overgarment (CPOG)/battle dress overgarment (BDO), overboots, gloves with inserts, one roll M9 detector paper, and one M258A1/M291 decontamination kit either worn or carried in their operational nuclear, chemical, biological (NBC) bag depending on MOPP level.

2. Additionally, all personnel will deploy with one individual chemical equipment (ICE) pack that includes a spare CPOG/BDO, protective mask hood, gloves with inserts, protective mask filter, one roll M9 detector paper, and one M258A1/M291 decontamination kit.

3. The section OIC/NCOIC will pack three (3) nerve agent antidote kits (NAAKs) Mark 1 and one (1) convulsant antidote for nerve agents (CANAs) per each deploying person and issue to each soldier as required by theater. The OIC/NCOIC will also pack and issue nerve agent pretreatment pyridostigmine (NAPP) tablets if available.

4. No MOPP level in effect during the loadup phase of the n-hour sequence. MOPP READY in effect prior to boarding the aircraft or other means of travel away from APOE/SPOE. Theater MOPP level in effect prior to landing at APOD/SPOD.

(b) Operational Exposure Guide (OEG). Theater guidance in effect.

(c) Vehicle recognition signals.

(4) Rules of engagement.

(5) Environmental considerations.

4. SERVICE SUPPORT

See Annex D (Logistics).

5. COMMAND AND SIGNAL

a. Command.

(1) For most contingencies, JTAGS will remain OPCON to ARSPACE and provide general or direct support to the theater. Under some circumstances, CINCSPACE may transfer OPCON to the theater CINC. The exact command relationship of the deploying JTAGS detachments/section(s) to the theater is dependent on the situation and IAW CINCSPACE Force Transfer Decision Tree (see Annex J (Command Relationships)).

(2) Deployment of CONUS contingency teams. The ranking ARSPACE military member of the advance party will command the advance party and the section(s) when it arrives unless a more senior ARSPACE officer arrives with the section.

Typically, the JTAGS branch chief or section OIC will be in command of the section(s). If the section(s) is deployed into the EUCOM or PACOM theater, the detachment commander from that theater will be prepared to take command. Succession of command is by rank. When ARSPACE retains OPCON, chain of command will flow from the in-theater commanding officer back to Commander, ARSPACE.

(3) State the location of key functional area leaders.

(4) List command posts and other C2 facilities and their locations.

b. Signal.

See Annex K (Command, Control, and Communications Systems).

ACKNOWLEDGE:

COMMANDER'S NAME
COL

Appendix B

Siting Checklist

When preparing to emplace a JTAGS unit, site selection is important for a number of reasons. The following is a listing of the general, power, electronic, and host-support considerations that must be taken into account when selecting the emplacement site for JTAGS. These considerations are basically the same for urban and nonurban areas. Within an urban environment, more line-of-sight obstacles (to DSP satellites) will be encountered and there will be additional requirements for deconfliction of frequencies.

GENERAL INFORMATION

JTAGS SITE

B-1. JTAGS requires approximately 10,000 square feet of area for operations (100 feet X 100 feet). The site should be relatively level (less than a 10-percent grade), out of the floodplain, and have a good view of the sky. The site must provide for a direct "drive-in" capability.

SHELTER

B-2. JTAGS is a 20-foot-long by 8-foot-wide ISO shelter. Mobilizers attached at each end extend the overall length to 37 feet. The footprint of a deployed JTAGS shelter also includes a trailer-mounted generator set, three mission antennas, and three UHF communication antennas. The shelter alone weighs 14,200 pounds. The total weight of the shelter with the mobilizer set attached is 20,500 pounds. An overhead view of the shelter is seen in Figure B-1.

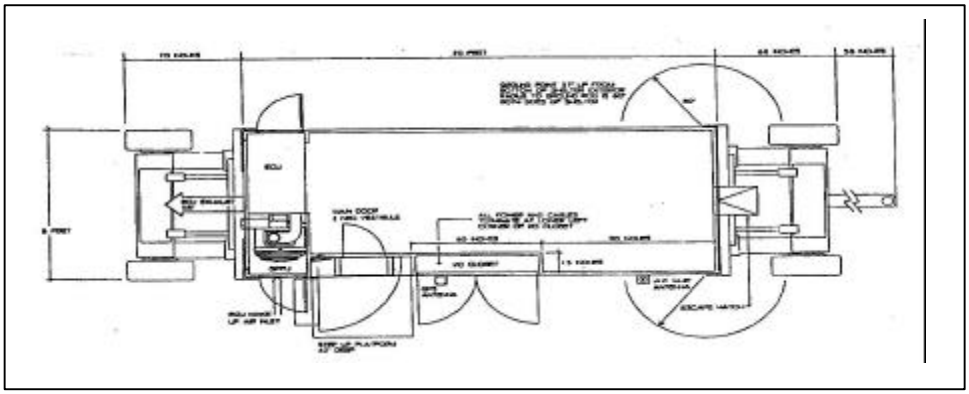


Figure B-1. JTAGS Shelter Plan View

ANTENNA LOCATION

B-3. Antenna placement must be within supplied antenna cable length restrictions. Antennas must have an unobstructed view of the satellite. All antenna fields of view must be clear of possible sources of interference with downlink reception (see Electronic section in this appendix). Antenna look angles are dependent on the site location and the satellite to be viewed. The antennas supplied with the JTAGS shelter are:

- Mission antenna (three each) (see Figure B-2).
- UHF communication antenna (see Figure B-3).
- Global positioning antenna (shelter mounted).

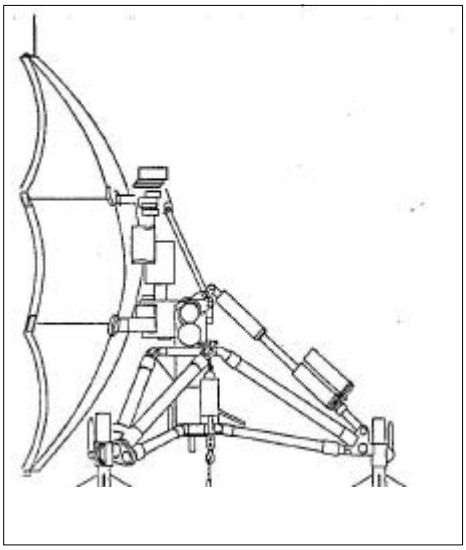


Figure B-2. Mission Antenna Elevation

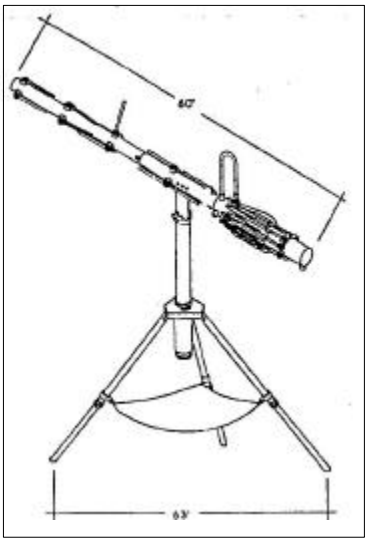


Figure B-3. UHF Antenna Elevation

Antennas used for satellite access (either sensor or communications) must be situated such that they are not looking over ridgelines or building peaks (can cause knife-edge diffraction) or through metal fences or heavy tree or other vegetation stands that can obscure their view of the satellites. For satellites that appear low on the horizon (less than 10 degrees), smooth surfaces such as concrete or water in front of the antenna can produce fading of the downlink signal strength because of multipath effects.

TELEPHONE

B-4. The JTAGS shelter accepts the following phonelines as pig-tailed cables by using a standard J1077 interface box supplied with the shelter:

- Two wire standard phonelines (nine each).
- Four wire Sectel digital nonsecure voice telephone (DNVT) data port (one each).

SITING CRITERIA

B-5. The site chosen must not be hostile either to the shelter, its peripheral equipment, or its personnel. Although transportable, the JTAGS section is not highly mobile; therefore, it is highly desirable that the JTAGS section not be forward deployed, but placed in rear echelon where it can remain relatively safe, since it is not designed to withstand direct hostile fire. The following are some general physical considerations.

PHYSICAL CHARACTERISTICS

B-6. Physical characteristics of a JTAGS site are:

- Relatively level ground (up to 10-percent grade allowable).
- Out of low lying areas.
- Not on highest point of land (lightning protection).
- No local terrain or geological instability (known earthquake fault).
- Unobstructed access to organic transport vehicles. Room for maneuvering shelter into position (i.e., turning radius = 60 feet).
- No major environmental or health hazard.
- No (or controllable) biological hazard.
- Provisions for management of heating, ventilation, and air-conditioning condensation runoff.
- Parking area for organic transport vehicles.
- Sufficient space for shelter, generator, and antenna farm. JTAGS antennas must be locatable within 30 meters of shelter.
- Single-channel ground and airborne radio system (SINCGARS) antennas should be located a minimum of 5 meters away from other SINCGARS antennas and also from the diesel generator.
- Should have good view of the sky.

POWER REQUIREMENTS

GENERAL DESCRIPTION

B-7. Preferred power for JTAGS is commercial 120-/208-Vac, three-phase, 60-Hz. Total power should not exceed 60 kW. Shelter power should be supplied by a circuit breaker or fused disconnect switch with a minimum current rating of 125 amps and a maximum rating of 200 amps.

A 60-kW trailer-mounted tactical quiet generator (TQG) towed by a 5-ton truck provides tactical power (see Figure B-4). The generator must be placed within the limit of the power cable and grounded within 6 feet of the generator's grounding lug. Adequate space is needed for refueling equipment to reach the generator. Care should be exercised in choosing the generator location with respect to the shelter's environmental control unit air intake in order to minimize the opportunity for exhaust fumes being drawn into the

shelter. The noise created by the generator set is rated at no more than 70 decibels at 7 meters (m) from the perimeter of the unit.

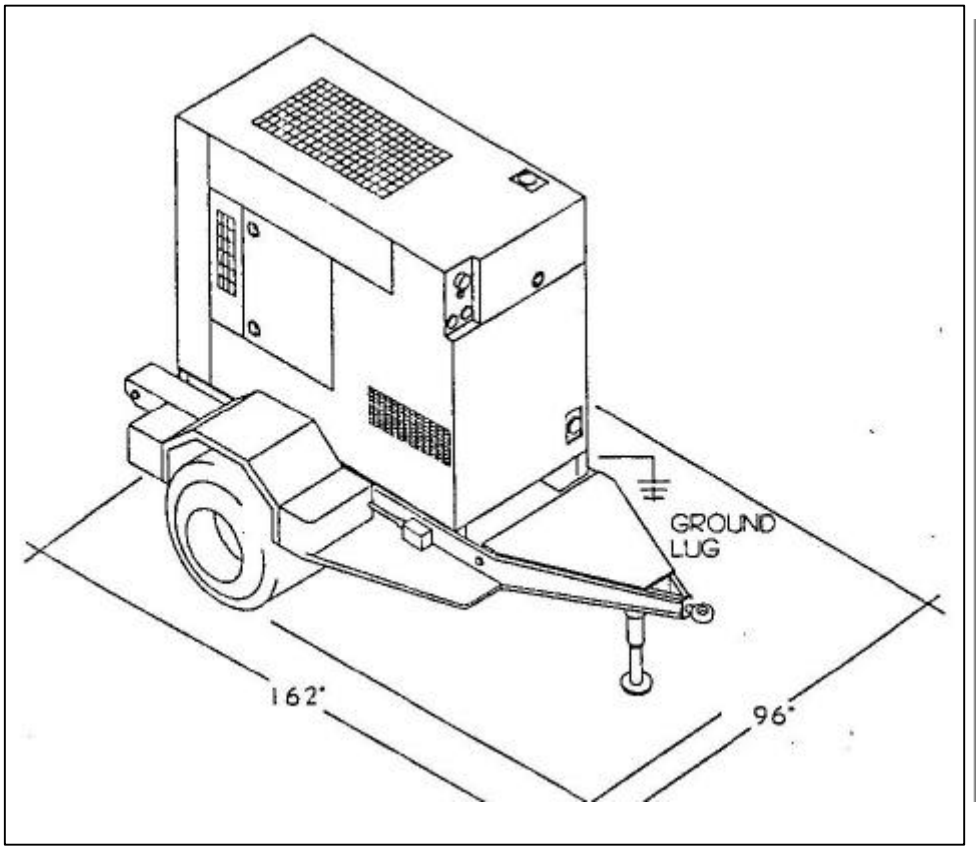


Figure B-4. Trailer-Mounted 60-kW Generator

ELECTRICAL POWER GUIDELINES

B-8. The following guidelines are recommended:

- Preferred method of electrical support is to use commercial power with the generator system as a backup.
- Ability to achieve low resistance grounding to Earth electrode as specified in MIL-STD-188-124B and MIL-HDBK-419.
- Not under or near high-voltage power lines.
- Not near a major thoroughfare (to reduce effects of ignition noise).
- Small portable gasoline-powered appliances such as lawnmowers, trimmers, and blowers must be at least 200 meters away from the JTAGS shelter during operation. Closer approach is allowable only when JTAGS is in maintenance or transport mode.
- JTAGS is designed to operate using commercial 60-Hz power when not in a tactical configuration. If 50-Hz is the only commercial power available at the host installation, a 50- to 60-Hz motor generator-converter must be used. USARSPACE is responsible for effecting

coordination to obtain the converters with the theater support command, if required. When commercial power is not be available, JTAGS uses a 60-kW TQG as the tactical power source. Generator support (i.e., maintenance, fuel, supplies, etc.) must be provided through the existing support structure.

ELECTRONIC

RADIO FREQUENCY INTERFERENCE SURVEY

B-9. The only reliable method of assessing potential radio frequency (RF) interference sources is to perform a survey by using an RF field strength meter at the selected operations site. RF emitters of many types, including the local oscillators in some up and down converters, can interfere with sensor satellite downlinks and communication links, both line-of-sight and satellite. In addition, certain high power emitters such as microwave devices and radars can be hazardous to both personnel and sensitive computer equipment.

B-10. The following recommended keep-out distances are established based on a generic electromagnetic interference (EMI) analysis; all distance values have been derived based on a smooth Earth with no significant terrain features. If a JTAGS unit, because of real estate limitations, must be placed closer to any emitter than its recommended keep-out distance, a detailed EMI analysis must be conducted to identify any type of potential interference or safety hazard prior to JTAGS emplacement. It is recognized that these keep-out distances are easily an order of magnitude greater than what would normally be allowable, but were chosen to maximize the safety factor.

MICROWAVE COMMUNICATION ANTENNAS

B-11. This is primarily a consideration for potential interference with the DSP downlink (2.230 to 2.240 GHz), since the power at the receiver is so low. The JTAGS DSP downlink antennas are highly directional and should not be placed where they have to look through a microwave antenna (in any orientation) in order to see the DSP satellite. The keep-out distances listed below take into account the Earth's curvature and normal spherical spreading loss of the microwave signal itself.

Table B-1. Keep-Out Distances

In Main Beam	10 km
In Sidelobes	5 km
Elsewhere	1 km

RADIO AND RADAR ANTENNAS

B-12. The following are considered to be minimum separation distances when the JTAGS shelter and its antennas must be placed in proximity of any radio or radar antenna. These distances include any system that operates at or near the DSP downlink frequency of 2232.5 MHz; the GPS downlink frequencies of 1227.6 and 1575.42 MHz; or which has the potential for generating any harmonics at the following distances:

Table B-2. Minimum Separation Distances

Mobile Radio Systems	5 m
Fixed and Large Radio Station Antennas	10 m
TMD GBR and Patriot Radar	1 km (in radar field of view)
	100 m (behind radar)
Other Portable/Transportable Radars	300 m
Aircraft Emitters	200 m
Friendly Countermeasures Equipment	200 m
Fixed Radar Antennas	1 km

AIRFIELDS

B-13. The required separation from airfields (air control/approach radars, communication antenna farms) is 1 km. In addition to the required separation distance from airfield emitters, JTAGS should not to be located near aircraft approach or departure corridors, nor under heavily traveled airways because of scintillation effects caused by reflection of satellite downlinks off of aircraft surfaces and the potential for interference from aircraft emitters radar, radar altimeter, electronic countermeasures, and Doppler navigator.

OTHER COMMUNICATION SYSTEMS

B-14. Communication systems such as JTIDS, SINCGARS, MSE, and TRI-TAC can present mutual interference hazards if their antennas are placed too close to a JTAGS shelter. While not a personnel hazard, they can reduce significantly each other's effectiveness and could also potentially interfere with satellite communication links. Placement of JTAGS communication and DSP downlink antennas must be accomplished so as to minimize or eliminate or cosite interference.

HOST SUPPORT

B-15. The following is a list of support services and equipment to be provided by the host base or command at which the JTAGS units are to emplaced:

- Security force/perimeter/access control.
- Personnel support facilities (billeting, messing, medical, recreational).
- Sanitary facilities (drinking water, sewage treatment).
- Area lighting.
- Lightning protection (lightning diversion if available).
- Shielding from direct sun (in hot climates if available).
- Camouflage netting (if required).
- Spare parts, logistic support.
- Fuel/oil/lubricants/fluids for generator, transport vehicles, and mobilizer motors.

- Transport and stowage of classified material, particularly cryptographic materials.
- Electrical power (60 Hz, three phase, 120/208 Vac) if available.
- Access to telephone connectivity (capable of supporting secure communications using STU-III and/or secure data device equipment — can be MSE/TRI-TAC access)

Appendix C

Safety and Risk Assessment

This appendix provides examples and guidelines concerning safety issues during or prior to combat operations. Commanders and their leadership representatives must ensure that safety is an ongoing process during wartime. Although not all-encompassing, this checklist provides commanders with some basic rules of safety. Leadership should consult Chapter 3 of AR 385-10, The Army Safety Program; and FM 100-14, Risk Management, for more information.

JTAGS SPECIFIC DANGERS

ELECTROMAGNETIC RADIATION HAZARD

C-1. Certain JTAGS antennas present the potential for serious injury or death because of radiation if the equipment is not properly handled. The LST-5 and CTT/H3 antennas emit electromagnetic radiation and present an RF shock and burn hazard when the receiver/transmitter is transmitting. The senior operator must VERIFY that the above radios are turned OFF *before* assembly and connection of any cables to the shelter I/O interface panel. All personnel must stay a minimum of 14 feet away from antennas while transmitting. Failure to comply could result in serious injury and/or death because of RF shock and burns.

HEAVY EQUIPMENT CAUTION

C-2. Some pieces of JTAGS equipment require more than one person to move or lift them. The use of improper procedures may result in injury or damaged equipment. The reflector disassembly procedure is a three-person operation. Failure to comply could result in injury because of excessive weight and the antenna falling during disassembly.

Leveling Jacks

C-3. The leveling jacks on the JTAGS shelter weigh approximately 145 pounds each, requiring a three-man lift and/or carry to prevent injury to crewmembers. Each crewmember should wear work gloves during installation of leveling jacks and ground rods to prevent scrapes and abrasions to hands.

Tripod/Positioner

C-4. The tripod/positioner weighs approximately 124 pounds, requiring a three-man lift and or carry during march order to prevent injury to crewmembers.

Generator

C-5. Ensure generator trailer handbrakes are set and rear support legs are emplaced *before* uncoupling trailer from vehicle. Three-man lift is required to remove lunette from the pintle. The attempt to move the generator once it is disconnected from vehicle may result in injury to personnel or equipment.

Tripod/Positioner Transport Frame

C-6. The tripod/positioner transport frame with all components weighs 169 pounds, requiring a four-man lift and/or carry to prevent injury to crewmembers.

Antenna Reflector Transport Frame

C-7. The antenna reflector transport frame with all components weighs 134 pounds, requiring a three-man lift and/or carry to prevent injury to crewmembers.

WEATHER-RELATED HAZARDS

C-8. Weather phenomena such as wind and lightning pose special dangers to soldiers during emplacement, march order, or normal operations. Do *not* assemble or disassemble the TACSTAR antenna when lightning is within a 5-mile radius of the shelter location. Failure to comply could result in serious injury or death.

Antenna Reflector Assembly

C-9. The antenna reflector should not be assembled in high-wind conditions to avoid injury to personnel or damage to equipment. High winds can catch the antenna dish and blow it down causing injury to personnel and damage the equipment. High winds are defined as winds in excess of 25 mph. Assembly of the antenna reflector must be accomplished by two or more operator/maintainers in winds below 25 mph. Assembly of the antenna in winds between 25 and 45 mph should not be performed unless absolutely necessary and then only with three or more operator/maintainers. Assembly of the antenna must *not* be performed in winds that exceed 45 mph. Failure to comply could result in injury to personnel and/or damage to the antenna.

Appendix D

Combat Operations Under Unusual Conditions

The following paragraphs describe the unusual environmental and weather conditions under which the JTAGS shelter can be operated. These paragraphs describe the conditions when the shelter can be operated and those conditions in which the shelter should not be operated.

DESERT CONDITIONS

D-1. The JTAGS shelter can be operated in a desert condition consisting of blowing sand and dust with particle concentrations up to 2.19 grams per cubic meter (g/m^3) in multidirectional strong winds. The JTAGS system should not be operated when the outside ambient temperature exceeds 120 degrees Farenheit (F).

TROPICAL CONDITIONS

D-2. The JTAGS shelter can be operated under tropical conditions that include rain, high temperature, and high humidity. The JTAGS can be operated during blowing rain, temperatures not to exceed 120 degrees F. If humidity is measured at less than or equal to 88 percent, JTAGS can be operated when temperatures range from 88 to 105 degrees Farenheit.

ARCTIC CONDITIONS

D-3. The JTAGS shelter can be operated under arctic conditions that include falling and blowing snow, icing, and high-wind conditions. The JTAGS system can be operated during exposure to falling snow with crystal size of 0.05- to 20.0-mm diameter. Antenna systems are susceptible to damage from ice, snow, and water accumulation. JTAGS personnel should effect special inspection and maintenance procedures to protect exposed equipment.

NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) CONDITIONS

D-4. The JTAGS shelter and communication and automation equipment can be operated in an NBC environment. The JTAGS is not vulnerable to chemical attacks, except for corrosive effects, if the equipment is not cleaned.

ELECTROMAGNETIC PULSE (EMP) CONDITIONS

D-5. If detachment personnel, the shelter, and communication and automation equipment survive a high-altitude nuclear burst, it is not likely that the JTAGS will function. EMP generated by a nuclear detonation could cause permanent circuitry damage by entering through antennas or unshielded connectors and traveling through entire networks. EMP can damage any electronic equipment that is not properly shielded and could disrupt the data received from reporting DSP satellites.

Appendix E

Nuclear, Biological, and Chemical Operations

The JTAGS equipment will survive NBC contamination and decontamination. Collective protection equipment is required, if available, for the selected system. Since JTAGS provided information is critical to TMD, it has been designed to withstand NBC contamination and decontamination to a level commensurate with theater command, control, communication, and intelligence (C3I) assets.

EQUIPMENT PROTECTION

E-1. All JTAGS equipment required for system operation and located outside of NBC protected areas, including unprotected shelter interiors, is fully operable and maintainable down to the replacement of line replaceable units by personnel wearing standard Army issue cold-weather and NBC protective clothing and equipment (MOPP IV). Consistent with the selected shelter capabilities, JTAGS has incorporated designs and resistive materials (e.g., chemical agent resistant coating) that reduce or prevent accumulation of NBC contamination and that withstand damaging effects of decontamination. JTAGS is decontaminable to negligible risk levels (0-33 less than 0.33 cGy/hr or one bar or lower reading on radiac set AN/PDR-27 or -77, and radiac set AN/VDR-2 on the chemical agent monitor (CAM)).

E-2. JTAGS has multiple components that are located external to the shelter. Even though the shelter is equipped with chemical protective equipment (CPE), external components will require maintenance or operator actions during missions that may include an NBC threat. The JTAGS system is able to continue its vital mission with personnel in NBC protective equipment as necessary. JTAGS is able to operate after such an attack without excessive requirements for decontamination or extraordinary precautions during decontamination.

DEFENSIVE OPERATIONS

E-3. NBC defense is critical in any conflict, but is particularly so whenever the opposing force has the capability to employ TBMs. To fight and win under NBC conditions requires an application of three fundamentals of NBC defense: contamination avoidance, protection, and decontamination.

CONTAMINATION AVOIDANCE

E-4. Avoidance addresses individual and/or unit measures taken to avoid or minimize NBC attacks and reduce the effects of the hazard. By taking

measures to avoid the effects of NBC attacks, the soldier can reduce his protective posture and decrease the likelihood and extent of decontamination.

NBC PROTECTION

E-5. NBC protection includes actions taken to physically counter the effects of the enemy's TBM capability and actions taken to maintain the health and morale of soldiers. NBC protection is divided into three broad areas: force, collective, and individual protection.

Force Protection

E-6. Force protection involves actions taken by the commander to reduce the vulnerability of the force to TBM attack. Success rests largely on the operational employment of NBC detectors and sensors with organic capabilities and from specialized NBC reconnaissance capability for baseline analysis, early warning, and agent identification.

Collective Protection

E-7. Collective protection provides a contamination-free environment for selected portions of the force by applying special filtration systems on vehicles and shelters. Collective protection is particularly valuable because it avoids the psychological and physiological burden of individual protection.

Individual Protection

E-8. Individual protection involves those actions taken by individuals to shield themselves from NBC effects in order to survive and continue the mission under NBC conditions. Individual protection is largely accomplished using MOPP gear, but will also include medical pretreatment measures taken to reduce the body's susceptibility to specific classes of chemical or biological agents or enable it to be more responsive.

DECONTAMINATION

E-9. The primary purposes of decontamination are to stop erosion of combat power and reduce casualties that may result in inadvertent exposure because of failure of protection. It is the reduction of the contamination hazard by removal or neutralization of hazardous levels of NBC contamination on personnel or equipment. FM 3-5, NBC Decontamination, provides detailed guidance on conducting decontamination operations.

Appendix F

Vehicle Movements and Convoys

Proper management of vehicle movements and convoy procedures will ultimately affect the number of vehicles on the battlefield and, more importantly, their timeliness in getting there. All leaders should ensure that the following conditions have been met during movement operations.

SPECIAL PRECAUTIONS

F-1. The M809/939 Series 5-ton cargo truck, used to tow the M1022A1 dolly set laden with the JTAGS shelter, must be loaded with at least 3 tons when towing the combination. Additionally, vehicle drivers must be made aware of the need for extra caution.

F-2. Drivers should be made aware that driving accidents involving the M939 series 5-ton trucks are commonly the result of vehicle operators driving too fast for conditions and/or locking the wheels when attempting to stop their vehicles.

F-3. The air brakes of the M939 series trucks are very sensitive when the trucks are lightly loaded, empty, or when operating the vehicle on wet or slippery pavement. The operator must gradually apply the brakes when stopping the vehicle. "Overbraking" will lock up the rear sets of wheels. Locked wheels may cause the engine to stall, which in turn leads to loss of steering. Any of these individual scenarios can lead to loss of vehicle control, resulting in collisions, jackknifing, and rollovers.

F-4. Maximum safe operating speeds are as follows:

Highway and Secondary Roads	40 miles per hour
Cross-Country Roads	35 miles per hour
Sand and Snow	25 miles per hour
Icy Conditions	12 miles per hour

F-5. Additionally, drivers should be advised to not use the hand throttle while driving. The hand throttle will not disengage when brakes are applied.

F-6. The JTAGS Product Office issued a memorandum subject: Request for Overload Waiver Approval for the M809/M939 Series 5 Ton Tactical Truck to Tow the M1022A1 Dolly Set Laden with an Army Rigid Wall Shelter, dated 5 February 1996, approving the use of the truck with the dolly set and shelter combination.

F-7. Unobstructed access is needed for organic transport vehicles to allow room for maneuvering shelter into position. Turning radius for the shelter is

approximately 60 feet. Planners should verify that any routes used by JTAGS shelters meet turning radius requirements of the mobilizer.

TACTICAL ROAD MARCH

F-8. This paragraph establishes procedures for the safe, effective road march of JTAGS personnel and equipment and provides guidelines for consistent, detailed convoy briefings. This applies to all personnel assigned, attached, or otherwise deployed with a JTAGS element.

F-9. The items below are designed to assist the convoy commander in ensuring that information relevant to the road march of personnel and equipment are addressed for the safest, most efficient move possible.

1. Where is start point? Release point?

2. What route is to be used?

3. Has reconnaissance been made and condition of route determined?

4. Can bridges and defiles safely accommodate all loaded vehicles?

5. Will minimum clearance on route accommodate the highest profile vehicle (5 tons = 116 inches, plus any items loaded on top of vehicle; Shelter = 109 inches with dolly lift set attached)?

6. Are critical points known and listed on strip maps?

7. Has the size of serials been determined?

8. Has the size of march units been determined?

9. What will be the rate of march?

10. What is the vehicle interval on an open road?

11. Type of column?

12. Have provisions been made for refueling if required?

13. Has a suitable bivouac site been selected if required?

14. Have suitable rest and mess halt areas been selected if required?

15. Is road movement table needed?

16. Have convoy clearances been obtained? What date?

17. Is escort required and has it been requested?

18. Are spare trucks available for emergencies?

19. Are vehicles fully serviced, clean, and ready for loading?

20. Is load proper, neat, balanced, and secured?

21. Are drivers properly briefed? By whom, when? Have strip maps been furnished?

22. Is convoy marked on front and rear of each march unit?

23. Are guides in place? Have arrangements been made to post guides?

24. Are blackout lights functioning?

25. Are maintenance services alerted?

26. Is maintenance truck in rear? Are medics in rear? Is there a plan for casualties?

27. Are all interested parties advised on estimated time of arrival (ETA)? Are tow bars on hand?

28. Is officer at rear of convoy ready to take necessary corrective action to transfer loads? Who is trail officer?

29. Is there a loading plan? Who is responsible?

30. Is there an unloading plan? Who is responsible?

31. Has a plan been made for feeding personnel?

32. Have times been established for loading?

33. Have times been established for unloading?

34. Has time been established for releasing trucks?

35. Is there a carefully conceived plan known to all personnel in the convoy that can be used in case of attack?

36. Is a written operations order on hand if required?

37. Will a log road movement be required?

38. Has weather forecast been obtained?

39. Do all personnel have proper clothing and equipment?

40. Is there a communication plan?

Appendix G

Exercise Support

"We train as we fight," therefore, JTAGS participation in theater and joint exercises is an essential part of normal operations. To the maximum extent possible, exercises involving JTAGS should exercise actual operational hardware, software, and procedures and should replicate the JTAGS communication architecture. USSPACECOM J3 will provide Cheyenne Mountain Operations Center (CMOC) and all TES elements the voice warning architecture and voice verbiage for all supported exercises.

EXERCISE METHODOLOGY

G-1. The TES elements must keep real-world and exercise data separate and clearly identified. The CMOC will normally have TDDS filters set to receive real-world data. On notification of an exercise, the MWC will configure their terminal 30 minutes prior to exercise start to receive exercise and real-world data. CMOC is responsible for building geographic filters for each theater or test location and is responsible for turning the filters on or off.

EXERCISE SCHEDULING

G-2. USSPACECOM/J330W approval is required prior to allowing JTAGS to inject exercise TBM or aircraft messages over the TDDS or TIBS network. Once the exercise is approved, SPJ330W is responsible for issuing a user message that announces exercise specifics. Exercise requests need to be at the J330W no later than 45 days prior to an exercise. This timetable allows for outside agencies to prepare for the exercise. The following checklist presents items that are required for exercise coordination. A message format defined by USSPACECOM will be used to request JTAGS exercise support/participation. *When data is filled in, both the checklist and request message will be classified SECRET.*

TBM WARNING EXERCISE CHECKLIST

(**SECRET- WHEN FILLED IN**)

TITLE _____
PURPOSE _____
SCENARIO _____
TIME OF EVENTS _____
LAUNCH LOCATION _____
LAUNCH HEADING _____
SPONSOR POC _____

SOURCE INFORMATION _____

CORRELATION INDEX _____
TRACK NUMBERS _____
AEN SERIES _____

EXERCISED FLAGGED _____
OFFSET REQUIRED _____
INJECTION SOURCE _____
TDDS MESSAGES (Y/N) _____
TIBS MESSAGES (Y/N) _____
DTG _____
RELEASER _____

USSPACECOM COORD.
NAME / NUMBER _____

MWC COORDINATION
NAME / NUMBER _____

Glossary

AADC	Area Air Defense Commander
AAFES	Army and Air Force exchange system
AAL	additional authorized list
AAMDC	Army Air and Missile Defense Command
AC	alternating current
AFB	Air Force base
ALERT	attack and launch early reporting to theater
AMCOM	Aviation and Missile Command
amp	ampere
AOI	area of interest
AOR	area of responsibility
APOD	aerial port of debarkation
APOE	aerial port of embarkation
AR	Army regulation

ARSPCC	Army Space Command Center
ASG	area support group
ASL	authorized stockage list
AUEL	automated unit equipment list
BDO	battle dress overgarment
BIT/BITE	built-in test/built-in-test equipment
BM/C4I	battle management/command, control, communications, computers, and intelligence
BMD	ballistic missile defense
BMDO	Ballistic Missile Defense Organization
C2	command and control
C3I	command, control, communications, and intelligence
C4I	command, control, communications, computers, and intelligence
CAM	chemical agent monitor
CANA	convulsant antidote nerve agent
CAT	crisis action team
CCIR	commander’s critical information requirement
CENTCOM	Central Command

cGy	Centigray
CINC	commander in chief
CLS	contractor logistics support
CMOC	Cheyenne Mountain Operations Center
COCOM	combatant command
COMSEC	communications security
CONOPS	concept of operations
CONPLAN	operation plan in concept format
CONUS	continental United States
CPE	chemical protective equipment
CPOG	chemical protective overgarment
CSC	computer software component
CSCI	computer software configuration item
CSS	combat service support
CTT	common task training
CTT/H3	commander’s tactical terminal/hybrid three channel
cue, cueing	designation of a target location
DA	Department of the Army

DACG	departure airfield control group
dBA	decibel
DCSCON	Deputy Chief of Staff, Contracting
DCSIM	Deputy Chief of Staff, Information Management
DCSINT	Deputy Chief of Staff, Intelligence
DCSLOG	Deputy Chief of Staff, Logistics
DCSOPS	Deputy Chief of Staff, Operations
DCSPER	Deputy Chief of Staff, Personnel
DCSRM	Deputy Chief of Staff, Resource Management
DET HQ	detachment headquarters
DNVT	digital nonsecure voice terminal
DOCC	Deep Operations Coordination Center
DOD	Department of Defense
DS	direct support
DSN	Defense Switching Network
DSP	Defense Support Program
DSU	direct support unit
EAC	echelons above corps

ECU	environmental control unit
EEFI	essential elements of friendly information
EMI	electromagnetic interference
EMP	electromagnetic pulse
ETA	estimated time of arrival
EUCOM	European Command
F	Farenheit
FD/FR	first detect, first report
FLTSATCOM	fleet satellite communications
FM	field manual
FM	frequency modulated
FSE	fire support element
ft	foot/feet
FWD	Forward
g/m^3	grams per cubic meter
GFE	Government furnished equipment
GHz	gigahertz
GMT	Greenwhich mean time

GS	general support
GSA	General Services Administration
HMMWV	high mobility multipurpose wheeled vehicle
HQ	headquarters
IAW	in accordance with
ICE	individual chemical equipment
ICW	in coordination with
IF	intermediate frequency
IPB	intelligence preparation of the battlefield
IR	Infrared
ISA	inter-service agreement
ISO	International Standards Organization
JFACC	Joint Force Air Component Commander
JFCC	Joint Force Component Commander
JSCP	joint space capabilities plan
JSTARS	joint surveillance target attack radar system
JTAGS	joint tactical ground station
JTIDS	joint tactical information distribution system

km	kilometer(s)
kVA	kilovoltampere
kW	kilowatt
LAR	logistic assistance representative
LASH	lighter aboard ship
lb	pound(s)
LNA	low noise amplifier
LRU	line replacement unit
LST-5D	Lightweight Secure Satellite Terminal
m	meter
MCS	main control station
METT-T	mission, enemy, terrain, troops, and time available
METT-TC	mission, enemy, terrain, troops, time available, and civilians
MHE	material handling equipment
MHz	Megahertz
MI	Military Intelligence
mm	millimeter
MOPP	mission-oriented protective posture

MOU	memorandum of understanding
mph	miles per hour
MRC-E	major regional conflict-East
MRC-W	major regional conflict-West
MRE	meals ready to eat
MSE	multisubscriber equipment
MSP	mission support plan
MWC-T	Missile Warning Center – Theater/Tactical
NAAK	nerve agent antidote kit
NAPP	nerve agent pretreatment pyridostigmine
NAVSPACECOM	Naval Space Command
NCOIC	noncommissioned officer in charge
NORAD	North American Aerospace Defense Command
OCONUS	outside the continental United States
ODS	Operation Desert Shield/Storm
OEG	operational exposure guide
OIC	officer in charge
OPCON	operational control

OPLAN	operations plan
OPORD	operations order
OPS	Operations
OPSEC	operations security
PACOM	Pacific Command
PAO	public affairs officer
PIR	priority intelligence requirement
PLL	prescribed load list
PMCS	preventive maintenance checks and services
POL	petroleum, oil, and lubricants
RF	radio frequency
RO/RO	roll on/roll off
SAEDA	subversion and espionage directed against the United States
SATCOM	satellite communications
SBIRS	space-based infrared system
SECDEF	Secretary of Defense
SED	sensor evolutionary development
SEW	shared early warning

SIGSEC	signals security
SINCGARS	single-channel ground and airborne radio system
SLIP	serial link interface protocol
SOP	standing operating procedure
SPOD	seaport of debarkation
SPOE	seaport of embarkation
SRP	soldier readiness processing
SSA	supply support activity
STU-III	secure telephone unit III
TACDAR	tactical detection and reporting
TACON	tactical control
TADIL-J	tactical data information link – joint
TAMMS	the Army maintenance management system
TBD	to be determined
TBM	tactical ballistic missile
TDDS	TRAP data distribution system
TDY	temporary duty
TERS	tactical event reporting system

TES	theater event system
THAAD	theater high-altitude air defense
TIBS	tactical information broadcast service
TM	technical manual
TMD	theater missile defense
TMDE	test, measurement, and diagnostic equipment
TMP	transportation motor pool
TNMC	tactical network mission center
TOC	tactical operations center
TOE	table(s) of organization and equipment
TPFDD	time-phased force deployment data
TPFDL	time-phased force deployment list; troop program field deployment list
TQG	tactical quiet generator
TRAP	tactical related applications
TRI-TAC	tri-service tactical communications
TSDE	tactical surveillance demonstration enhancement
UHF	ultra-high frequency
ULLS-G	unit level logistics system-ground

UPS	uninterruptable power supply
US	United States
USARSPACE	United States Army Space Command
USCENTCOM	United States Army Central Command
USCINCSPACE	Commander in Chief, USSPACECOM
USFK	United States Forces, Korea
USSPACECOM	United State Space Command
Vac	volts alternating current
VHF	very high frequency

Bibliography

Concept of Operations for Command and Control of Space Forces, United States Space Command, Peterson Air Base, Colorado Springs, Colorado, 23 September 1998.

Drills for Joint Tactical Ground Station Subsystems, Headquarters, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, 28 March 1997.

FM 100-12, Army Theater Missile Defense Operations; Headquarters, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, (Draft).

FM 100-18, Space Support to Army Operations, Headquarters, Department of the Army, July 1995.

Joint Publication 3-01.5, Doctrine for Joint Theater Missile Defense, Joint Doctrine Division, J-7, 7000 Joint Staff, Pentagon, Washington, District of Columbia, 22 Feb 1996.

Joint Tactical Ground Station Materiel Fielding Plan, Huntsville, Alabama, 19 November 1996.

JTAGS Operations Concept (CONOPS), Headquarters, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, 30 January 1995.

Mission Training Plan for an ADA Joint Tactical Ground Station Detachment, Headquarters, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, (Draft).

Organizations and Functions Manual, Headquarters, United States Army Space Command (Forward), Colorado Springs, Colorado, 15 September 1995.

Soldier's Manual MOS 14J, Joint Tactical Ground Station Detachment, Air Defense C4I Systems Operator, Skill Levels 1, 2, 3, and 4 Headquarters, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, 30 July 1996.

Technical Manuals

Calibrations and Repair Requirements for the Maintenance of Army Materiel, TB 43-180.

Command System, Tactical: AN/TYS-1 (NSN 5895-01-417-1880), EIC:NTA, Volume 1&2, Joint Tactical Ground Station System, TM 9-5895-616-12&P-1&2.

Destruction of Army Electronics Material to Prevent Enemy Use, TM 750-244-2.

Functional Users Manual for the Army Maintenance Management System, DA PAM 738-750.

Intermediate Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for Door Assembly, External, Integrated Protective Entrance, S-250 Shelter and Door Assembly, External Integrated Protective Entrance, S-280 Shelter, TM 3-4240-302-30&P-11.

Intermediate Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for Protective Entrance Module (NSN 4240-01-307-3938), TM 3-4240-302-30&P-13.

Operator and Unit Maintenance for AN/CYZ-10 Automated Net Control Device (ANCD) (NSN 5810-01-343-1194) EIC:QSU) with the single channel Ground and airborne radio systems (SINCGARS), TB 11-5820-890-12.

Operator and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Collective Protection Equipment, NBC Simplified, M20, TM3-4240-288-12&P.

Operator, Unit, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) Power Unit, Diesel Engine Driven, 2 ½ Ton Trailer Mounted (NSN 6115-01-317-2134), TM 9-6115-663-13&P.

Operator's and Aviation Unit Maintenance Manual, Repair Parts and Special Tools List, Control Unit, Communications System C-11746 (V) (_)/ARC, TM 11-5895-1369-20P.

Operator's and Organizational Maintenance Manual (Including Repair Parts and Special Tools List) Tactical Command System AN/USC-55A (NSN 5895-01-443-9072), TM 11-5895-1617-12&20P.

Operator's and Organizational Manual (Including Repair Parts and Special Tools List) for Distribution Boxes J-1077/U and J-1077A/U (NSN 6110-00-985-7574), TM 11-6110-201-12P.

Operator's Manual for Generator Set, Skid Mounted, Tactical Quiet 60 kW, 50/60 And 400 Hz Mep-806a (50/60 Hz), (NSN 6115-01-274-7390), TM 9-6115-645-10&20P.

Operator's Manual for SINCGARS Ground Combat Net Radio, TM 11-5820-890-10-1.

Operator's Manual for Truck, Utility - Cargo/Troop Carrier, 1-1/4 Ton, 4x4, M998 (NSN 2320-01-107-7155), M998A1 (2320-01-371-9577), TM 9-2320-280-10.

Operator's Manual for Truck, 5-Ton, 6x6, M939 (Diesel), TM 9-2320-272-10.

Operator's, Organizational, Direct Support, and General Maintenance Manual (Including Repair Parts and Special Tools List) for Trailer: Generator 2 ½ Ton 2-Wheel, M200A1, TM 9-2330-205-14&P.

Operator's, Unit and Intermediate Direct, and General Support Maintenance Manual Digital Multimeter AN/PSM-45A (NSN 6625-01-262-6000), TM 11-6625-3199-14.

Operator's Unit, Direct Support and General Maintenance Manual Including RPSTL for Dolly Set Lift M1022-A1, TM 9-2330-390-14&P.

Organizational Maintenance Manual for Truck, 5-Ton, 6x6, M939 (Diesel), TM 9-2320-272-20-1.

Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Entrance, Protective, Pressurized: Integrated, External, S-280 Shelter, M20 (NSN 4240-01-283-0194), TM 3-4240-332-20&P.

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