MSE maintenance and supply concepts

....the MSE logistics concepts provide the most cost effective, efficient support of MSE equipment in the field.

by Glenn J. Strellner

The government is procuring MSE as a nondevelopmental item (NDI) and as a total system. During the evaluation phase, contractors were required to submit detailed plans describing the proposed supply and maintenance concept, based on unit level actions performed by U.S. Army personnel. They also provided supply plans necessary to ensure the availability of maintenance spares for not less than 15 years following delivery of the last MSE items, a configuration management method to support procurement of MSE elements and spares, and the procedure by which performance and maintenance improvements would be incorporated into the system while maintaining interchangeability with previously produced MSE.

There are three contracts associated with MSE. The first contract (with six options) stipulates that GTE provide and field all of the hardware and technical data, and provide initial spares. The second contract provides for contractor support, replenishment spares for MSE-unique items, and contractor training. The third is a time and materials contract for software enhancements, production, and distribution after the system warranty expires.

In order to understand the MSE logistics concept, one needs to understand what the system generally consists of. MSE is a reengineered NDI-hybrid system that includes nonstandard items (those not in the Army inventory), standard-modified items (those that are standard Army equipment, but with modified compatibility), and standard items (those either fielded or to be fielded). Standard-modified end items are considered nonstandard overall but do contain standard Army items at line replaceable unit (LRU) and/or circuit card assembly (CCA)/printed circuit board (PCB) levels. As a result, the logistics concept for MSE can best be described as a contractor/government mix for the life of the

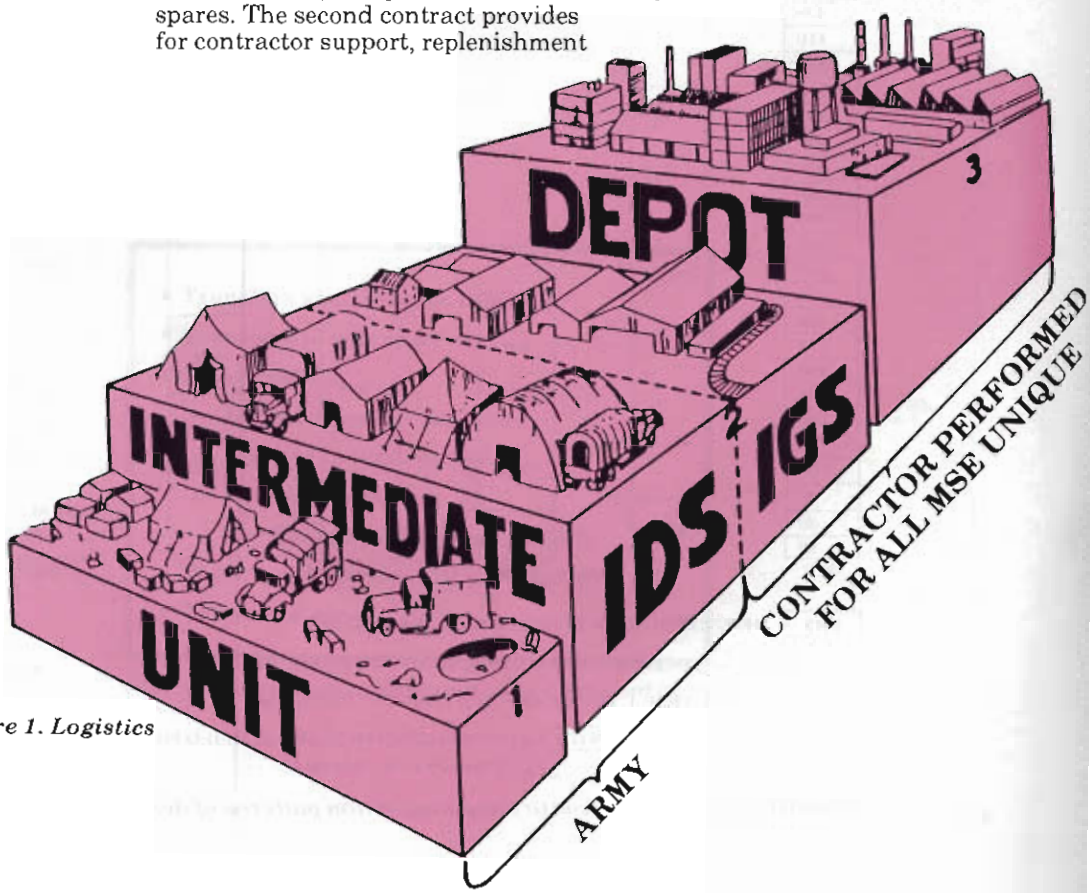

Figure 1. Logistics

system. The government will provide logistics support through intermediate direct support (IDS) level for all MSE, as well as for standard equipment at all levels; GTE will support intermediate general support (IGS) level and above for all nonstandard equipment. It is important to remember that this concept is applicable down to the mix of CCA/PCB found in a standard-modified item. Figure 1 depicts the overall logistics relationship between the Army and GTE.

Under the proposed maintenance and supply concept, the Army support system will support most standard Army items. GTE will also provide the necessary integrated logistics support (ILS) elements, such as manuals, provisioning data, spare and repair parts, ground support equipment, training, etc. GTE will also provide IGS and depot level maintenance and supply support for standard items not having a support system in place, and will continue to provide such support until the Army support system is capable of supporting standard items furnished as part of the MSE system. Figure 2 illustrates the maintenance flow.

The MSE system maintenance concept is based on the three standard levels of Army maintenance: unit, intermediate, and depot; and since MSE will be used by Army field units, intermediate maintenance will be subdivided into IDS and IGS. Signal battalions will continue to perform IDS level maintenance on organic C-E equipment, both for MSE and other C-E systems. MSE-peculiar maintenance, however, will be supported by a separate maintenance facility (consisting of two S-250E shelters mounted on M-1037 HMMWVs, a 10kw generator, and a cargo trailer) for each Signal battalion. This facility will house all MSE C-E required TMDE, tools, and publications (except COMSEC), as well as provide repair positions for system maintainers. These facilities will be organic to the HHC and operate primarily in that location, but they will be available, along with the prescribed load list (PLL)/spares facilities, for mobile maintenance contact team support of deployed nodal elements.

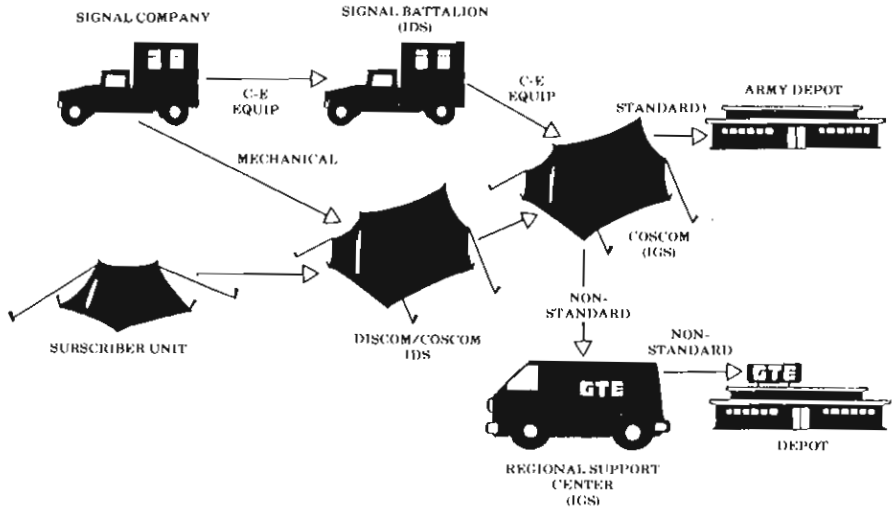

Figure 2. MSE maintenance flow

Signal unit-level maintenance will include preventive maintenance or repair of MSE mechanical equipment (vehicles, shelters, trailers, ECUs, and generators), as well as of MSE communications-electronics equipment and general support equipment. Minor preventive maintenance tasks on mechanical equipment normally will be performed by the operator; more significant preventive tasks and unit level repairs will be performed by maintenance personnel in the battalion maintenance section. Mechanical equipment requiring maintenance beyond the unit level will be evacuated to the supporting IDS maintenance unit for repair.

C-E unit maintenance will be limited to the use of built-in fault detection/fault isolation devices, the use of common TMDE and tools, and the replacement of fuses, bulbs, and selected line replaceable units (LRUs). These tasks will be performed by operators. When the required maintenance action is beyond the capability (or authorization) of the unit level, the failed unit will either be evacuated to the Signal battalion C-E maintenance section, or, in the case of problems in a major assemblage (node center switch (NCS), RAU, etc.), a team from the battalion C-E maintenance section will travel to the assemblage to perform IDS level maintenance. These teams will be tailored specifically to solve the problem and can consist of any combination of five MOSs (29M, 29N, 29E, 29S, and 29J) as required.

MSE-related Signal unit mechanical equipment requiring maintenance beyond that provided by the unit level will be evacuated to the supporting IDS maintenance unit in accordance with the standard Army maintenance system. The Signal battalion C-E maintenance section will provide IDS level support for Signal unit C-E equipment. This maintenance will involve fault detection and fault isolation using built in test equipment (BITE), the ER-222/M2 radio test bench, and standard TMDE; it will also involve replacement of the faulty LRU. The IDS unit will also perform limited repairs of connectors, wiring, etc. All MSE major assemblages should normally be returned to full operation through IDS maintenance. Failed LRUs and unserviceable assemblies beyond the capability of the IDS will be evacuated to IGS.

MSE subscribers in non-Signal units will have mobile subscriber radio terminals (MSRTs), which will consist of ER-222/M2 radios and KY-68 digital subscriber voice terminals (DSVTs), associated antennas and cabling, digital nonsecure voice terminals (DNVTs), and in some cases AN/UXC-7 facsimile equipment. Unit maintenance on this equipment will be limited to replacing handsets or ribbons, tightening connections, etc. If repair is beyond the unit capability, the failed item will be evacuated to the supporting IDS

unit for exchange or repair. All divisional non-Signal subscribers will be supported by one of the forward support elements of the DISCOM. Corps non-Signal units will be supported by one of the TOE 29-209 units in the corps area. Failed MSRT radios will either be exchanged (in division only) or repaired and returned. The contractor will provide each DISCOM main support element and each of the 29-209 support companies with a test set for fault detection/fault isolation of the ER-222/M2 radio and appropriate TMDE to test and repair the AN/UXC-7.

The contractor will provide IGS maintenance of nonstandard items via facilities located in each corps area. The contractor will provide these services for the life of the MSE system—which is defined as 15 years after acceptance of the last MSE hardware item or 22 years from the contract award. Depot functions for nonstandard items will also be the contractor's responsibility. Figure 3 pinpoints these locations.

The contractor will provide interim support in the form of technical assistance to Army IDS maintenance personnel repairing MSE system equipment. This support will normally be provided to each unit for 12 months after turnover. To ensure rapid response, six contractor personnel will initially be colocated with each Signal battalion headquarters. After three months, this on-site support will be reduced to two MSE technicians. Although the primary function of interim support is technical advice and assistance, it will include "hands-on" repair when necessary to ensure that the MSE system remains operational.

U.S. Army standard equipment or subcomponents used in MSE that currently use automatic test equipment (ATE) as part of their maintenance concept will continue to do so. Required ATE and test program sets will be available at required locations to support the additional density of standard equipment.

The maintenance concept for the Army National Guard differs from that of the active component during peacetime, though these differences will disappear if the Guard unit is mobilized. During peacetime, most IDS and IGS maintenance will be performed in the state's installation level combined support maintenance shop (CSMS). The CSMS is staffed with full-time Guard employees who are usually members of an Guard TOE maintenance unit often colocated with the CSMS. As a non-combat unit, the CSMS will maintain a shop stock rather than an authorized stockage list (ASL) or repair parts. Repair parts will be requisitioned through the state's U.S. property fiscal officer (USPFO). As the National Guard Bureau's agent in the state, the USPFO will be accountable for all federal funds. Guard units that have a Signal battalion located within their state boundary will obtain IDS maintenance from the Signal battalion. Those that do not will exchange reparable MSE equipment with the CSMS. The CSMS will requisition replacement equipment using normal procedures. Requisitions for nonstandard items will be forwarded to GTE by the national inventory control point (NICP). Failed MSE peculiar LRUs will be shipped to GTE Taunton Regional Support Center (RSC). Since Guard units are operational during weekend drills and annual training (approximately 36-40 days per year), on-site, on-call technical assistance will be provided. The Taunton RSC will coordinate all support of the National Guard.

Figure 3. MSE GTE regional support centers

Each Army Reserve unit will be assigned to an Active Army installation for logistics support. Those units assigned to an installation where there is an active unit providing IDS support to MSE equipment (i.e., division Signal battalion, maintenance battalion, or directorate of industrial operations (DIO) specially equipped to provide support) will use those facilities and will follow the same procedures as active units for both maintenance and supply of MSE equipment. Reserve units assigned to an installation where there is no IDS capability for MSE will provide their requisitions and unserviceable turn-ins to DIO. For those installations with sufficient density, a repair exchange (RX) capability will be established. Due to the density of ER-222 radios supported by Fort Bliss, Fort Knox, Fort Benning, and Fort Sill, an ER-222 test bench and ER-222 spare parts will be located at each.

Supply support for standard Army equipment used in MSE will follow existing Army procedures at all levels of maintenance. Support for MSE nonstandard equipment will follow existing Army procedures at the unit and IDS levels; GTE will provide IGS and depot level maintenance supply support through regional support centers and a contractor depot.

GTE will provide the required initial PLL/ASL/spares to unit and IDS levels for all MSE equipment. For division Signal and corps Signal support battalions, GTE will provide three PLL/spares facilities (exclusive of Korea); for corps area Signal battalions, they will provide four. Each facility will consist of an S-250E

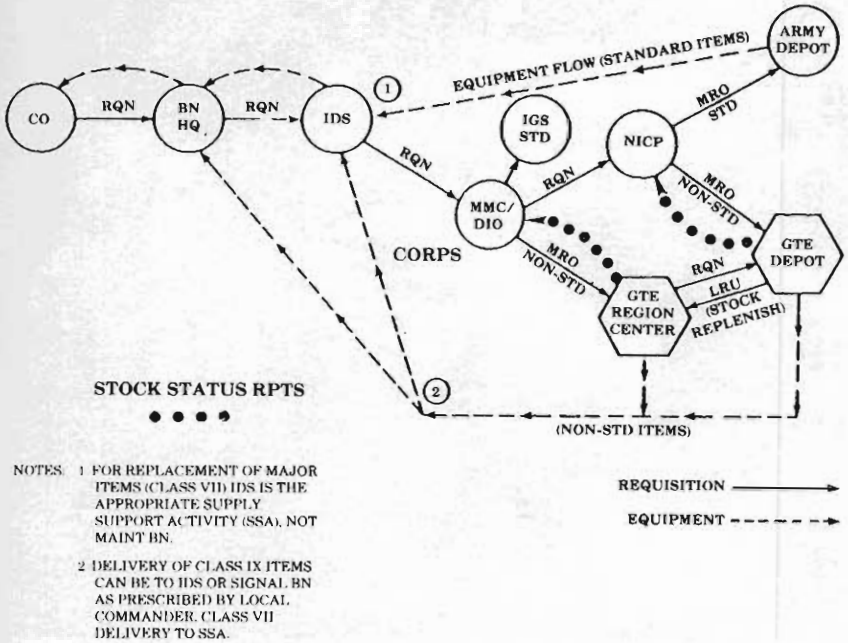

Figure 4. Signal battalion replenishment requisition and materiel flow for class VII (end items) and class IX (repair parts)

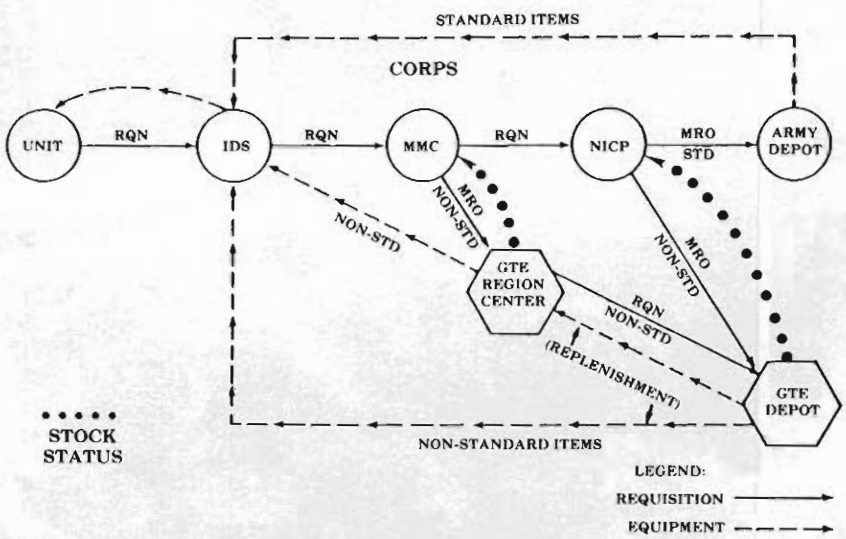

Figure 5. Non-Signal user replenishment requisition and equipment flow for class VII (end items) and class IX (repair parts)

shelter mounted on an M1037 HMMWV. The shelters will provide bench space for supply clerks to maintain records and stockage levels, and racks and drawers to store the MSE C-E equipment repair parts. One of the facilities will support the battalion's IDS repair mission for MSE C-E equipment; the others will provide for consolidated company PLL. GTE will provide all required technical documentation, and the fielding team will provide all required interface with the gaining unit's supply and accountability systems. Standard requisitioning procedures will be used to replenish PLL and not-carried items, as well as for requests for issue of major end items. Requisitions for standard Army items will be processed in accordance with current procedures *(AR 710-2, AR 725-50, DA PAM 710-2-2)*. Requisitions for nonstandard MSE items will flow through Army channels to the appropriate materiel management center (MMC) of the NICP for materiel release order (MRO) processing and subsequent shipment from either the contractor's RSC or depot. See Figures 4 and 5 for Signal battalion supply flow and non-Signal user supply flow, respectively.

The Army standard communications security equipment being fielded with MSE will be maintained and resupplied in accordance with standard Army procedures. Nonstandard communications security equipment requiring repair will be forwarded by courier to the contractor-identified depot location. When distance makes unit courier impractical, the Army Force Courier Services (ARFCOS) or other authorized means of shipment will be used. A DA Form 2407 and SF 153, "Report of COMSEC Material," must accompany each item returned for repair. The contractor will ship communications security equipment to the Army via ARFCOS or other approved COMSEC materiel control channel. An SF153 must accompany each shipment. All COMSEC materiel will be shipped, stored, repaired, and accounted for in accordance with Army and NSA approved COMSEC procedures. GTE will provide all initial PLL/repair parts, tools, and test equipment required to support MSE COMSEC equipment at the IDS level. Signal battalions will, however, be responsible for maintaining all classified COMSEC equipment so that these resources will merge with existing COMSEC maintenance facilities.

In summary, the MSE logistics concepts provide the most cost effective, efficient support of MSE equipment in the field. If properly implemented, they will improve system operational availability with minimal impact on Army support resources at IGS level and above.

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