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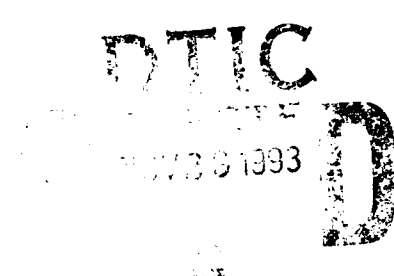


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**INTELLIGENCE AND ELECTRONIC
WARFARE (IEW) STREAMLINING
PROJECT**

**Volume I
Sustainment Analysis Report
Revised October 30, 1992**



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IEW STREAMLINING PROJECT

Volume I

Sustainment Analysis Report

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October 30, 1992

PREFACE

18 November 1992

This volume is the first of a set comprising the cumulative documentation of the IEW Streamlining Study. As of this date the current documentation includes the following:

<u>Volume Number</u>	<u>Date</u>	<u>Title</u>
<i>I</i>	<i>October 30, 1992</i>	<i>Sustainment Analysis Report</i>
<i>II</i>	<i>November 18, 1992</i>	<i>Directives and Related Study Documents</i>
<i>III, Part 1</i>	<i>September 1, 1992</i>	<i>Reference Documentation</i>
<i>III, Part 2</i>	<i>September 1, 1992</i>	<i>Reference Documentation</i>
<i>III, Part 3</i>	<i>September 1, 1992</i>	<i>Reference Documentation</i>
<i>III, Part 4</i>	<i>September 1, 1992</i>	<i>Reference Documentation</i>
<i>III, Part 5</i>	<i>November 18, 1992</i>	<i>Reference Documentation</i>
<i>IV, Part 1</i>	<i>September 1, 1992</i>	<i>Systems Sustainment (classified)</i>
<i>IV, Part 2</i>	<i>September 1, 1992</i>	<i>Systems Sustainment (classified)</i>

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APPENDIX E: System Acquisition Documentation

APPENDIX F: IEW Sustainment Concept Plan

APPENDIX G: Final Report Briefing Graphics

GLOSSARY OF ABBREVIATIONS

Chapter 1

INTRODUCTION AND BACKGROUND

Purpose

This Sustainment Analysis Report identifies major issues and contains findings, alternatives, and recommendations developed during the IEW Streamlining Study.

Problem Statement

Operations DESERT SHIELD and DESERT STORM (ODS) highlighted key problems in how the Army provides logistics support for its intelligence and electronic warfare (IEW) equipment (see Appendix A, reference 1). IEW materiel consists of nondevelopmental systems and training and experimental systems in addition to standard Army systems. Materiel developers such as Major Army Commands (MACOMs) and system program and project managers (PMs) often set up unique support mechanisms to provide materiel supply, maintenance, training, and documentation for these systems. The fragmentation of IEW sustainment has resulted in--

- a myriad of non-integrated logistics processes
- heavy reliance on multiple contractors supporting various MACOMs and PMs resulting in multiple channels of support
- higher cost
- needless duplication of functions (such as, management, overhead, facilities, etc.)

Military Intelligence (MI) units are forced to cope with a wide variety of diverse processes and procedures in order to obtain logistics support. Lessons learned from ODS, Defense Management Review Decisions (DMRD) mandating streamlining and consolidation, and the reality of decreasing budgets dictate that the Army's process for sustaining crucial IEW equipment become standardized, simpler, more effective, and less expensive.

At the direction of the Vice Chief of Staff of the Army (VCSA) (reference 2), the Army Materiel Command (AMC) undertook a project aimed at achieving these results. Specifically, the objective of the analysis was "to determine how to integrate and streamline battlefield sustainment of IEW operations on a dynamic and austere airland battlefield, with particular focus on support to key, advanced technology NDI and prototype systems." Reference 2.1 tasked AMC to "conduct a system-by-system review of battlefield IEW for all echelons of sustainment."

Agency Goals

The Army's overall goal for this project is to streamline the logistics support structure for IEW equipment, thereby increasing readiness and decreasing costs.

The anticipated results of the IEW Streamlining study are--

- increased readiness
- the development and institutionalization of a sustainment process for IEW equipment which is designed to function effectively in both peace and war
- the development of accompanying doctrine suitable for both users and developers
- decreased costs through standardization and simplification
- increased effectiveness during conflict

After completion of the IEW Streamlining project, the Army's process for fielding and sustaining its IEW equipment can be expected to be--

- standardized
- more cost-effective
- more timely
- simpler
- higher in quality
- more user-friendly

Project Relationships

The Army has undertaken this project in an effort to develop an improved process. To ensure this project is as comprehensive as possible, the Army included key organizations in the IEW Streamlining study group. These organizations include--

- AMC, which is charged with project lead responsibility; this responsibility is exercised through its subordinate organization, the Communications-Electronics Command (CECOM) Intelligence Materiel Management Center (CIMMC)
- Training and Doctrine Command (TRADOC) to provide doctrinal input and guidance

- Intelligence and Security Command (INSCOM) to address concerns of echelons above corps (EAC)
- Forces Command (FORSCOM) to address concerns of echelons corps and below (ECB) and EAC general support (GS) maintenance elements
- United States Army Special Operations Command (USASOC) to address the concerns of special mission forces for sustainment of Army standard and unique Special Operations Force (SOF) equipment
- Program Executive Office for Intelligence and Electronic Warfare (PEO-IEW) to address concerns of IEW systems acquisition

In addition the Offices of the Deputy Chiefs of Staff of the Army for Logistics, Operations and Plans, and Intelligence provide Headquarters, Department of the Army guidance and project oversight; and BDM International, Inc. provided analytical support to the study group through a contract with the U.S. Office of Personnel Management.

Perhaps reflecting some of the Army-wide confusion regarding the responsibility for IEW materiel sustainment, the lead activity within some of the participating organizations changed during the course of the study from the intelligence or operations staff section to the logistics staff section.

Special Considerations

In developing the streamlined support structure, the study group has considered--

- the special support requirements of IEW equipment with a focus on supporting the battlefield of the late 1990s
- the role of nondevelopmental items (NDI) and advanced technology insertion
- the support implications of peacetime versus wartime environments
- Defense Management Review Decisions (DMRD) focused on streamlining and consolidation in order to achieve increased economies and efficiencies within the Department of Defense
- the existence of multiple, autonomous support mechanisms resulting in--
 - duplicative support resources (e.g., contract management, supply, facilities, quality assurance, administrative overhead, etc.)
 - complex, confused lines of communication and lack of coordination

- the high cost and low density of IEW spares
- the requirement to deploy integrated IEW sustainment resources into theaters of operations to ensure an acceptable level of system readiness

Volume I, the Sustainment Analysis Report, consists of four chapters, a number of appendices, and a glossary of abbreviations.

- Chapter 1 has provided an introduction and the background of the study.
- Chapter 2 indicates the methodology used to conduct the study.
- Chapter 3 is devoted to analysis and discussion of the major issues involved in streamlining the sustainment of IEW systems
- Chapter 4 provides a consolidated listing of conclusions, discussion of various alternatives considered by the study team, and a recommended structure for streamlining IEW sustainment.
- Appendix A contains a listing of key references cited in Volume I.
- Appendix B has a listing of the sample of IEW systems that the study group considered during the course of the study.
- Appendix C provides a description of the Army standard maintenance system.
- Appendix D includes a description of the Army standard supply system.
- Appendix E contains a description of the system acquisition documentation process as it affects IEW sustainment.
- Appendix F is a copy of the IEW Sustainment Concept Plan as of 16 October 1992.
- Appendix G includes a copy of the briefing graphics presented to the General Officer Steering Committee on 16 October 1992.

Chapter 2

STUDY METHODOLOGY

The study methodology involves data collection and analysis to support the eventual development of conclusions and recommendations. Data collection has included--

- review of Government furnished information and other documentation bearing on the subject
- site visits and interviews with various subject matter experts (see figures 2-1 and 2-2) (Note: Although the study group received many useful comments from the field during site visits, not all comments could be independently verified. This study report will note those cases wherein comments could not be verified.)
- review and analysis of verbal input provided to members of the study group concerning MACOM-unique issues and the status of on-going initiatives within MI and mainstream Army logistics

The study group collected data relating to IEW equipment sustainment flows encompassing maintenance, supply, and technical documentation for each of a sample of current and emerging sets of IEW equipment (see Appendix B, IEW Systems List). The sample represents a variety of platforms, developers, and users; it was not intended to be an all-inclusive list of IEW systems. Where available, data was collected--

- for three specified time periods (i.e., pre-DESERT SHIELD, during DESERT SHIELD/STORM, and post-DESERT STORM to include future system requirements)
- for peacetime and wartime scenarios
- across the various intelligence disciplines (e.g., signal intelligence or SIGINT, electronic intelligence or ELINT, communications intelligence or COMINT, etc.)
- across various theaters of operations (continental US or CONUS, US Army Europe [USAREUR], Southwest Asia or SWA, and Korea)

Units Visited	Installation
124th Military Intelligence Battalion (CEWI)	Fort Stewart, GA
158th Maintenance Detachment (GS)	Fort Bragg, NC
312th Military Intelligence Battalion (CEWI)	Fort Hood, TX
504th Military Intelligence Brigade	Fort Hood, TX
163d Military Intelligence Battalion (Tactical Exploitation)	Fort Hood, TX
303d Military Intelligence Battalion (Operations)	Fort Hood, TX
15th Military Intelligence Battalion (Aerial Exploitation)	Fort Hood, TX
263d Light Equipment Maint Co (GS)	Fort Hood, TX
159th Maintenance Detachment (GS)	Fort Hood, TX
311th Military Intelligence Battalion (CEWI)	Fort Campbell, KY
XVIII Airborne Corps G4	Fort Bragg, NC
313th Military Intelligence Battalion (CEWI)	Fort Bragg, NC
519th Military Intelligence Battalion (Tactical Exploitation)	Fort Bragg, NC
319th Military Intelligence Battalion	Fort Bragg, NC

Figure 2-1, Units Visited during Initial Site Visits

Personnel Interviewed	Representing	Location
CW3 Stewart	513th MI Bde (ODS unit)	Vint Hill Farms Station, VA
CW3 Summers	533d MI Bn (ODS unit)	Vint Hill Farms Station, VA
CW2 Lehtimaki	201st MI Bn	Vint Hill Farms Station, VA
Mr. Bill Faux	IEW LAR Master Technician	USAREUR
SFC Wheeler	IEW LAR (MOS 33T40)	USAREUR
Mr. Dae Rhim	IEW LAR	Korea
Mr. Bruce Stees	IEW LAR	Vint Hill Farms Station, VA
LTC Hamilton	LAO	Fort Stewart, GA
Mr. Marvin Knight	IEW LAR	Fort Stewart, GA
Mr. John Luke	124th MI Bn (ODS unit) IEW LAR (currently)	Fort Hood, TX
CW2 McDonald	158th GS Maint Det (ODS unit)	Fort Bragg, NC
CW2 Lonnais	158th GS Maint Det	Fort Bragg, NC
Mr. Kenneth Greenwalt	ManTech SRA Site Chief	Korea
WO1 Conner	GS maint det	Korea
Mr. Van Blarcum	IEW LAR	Fort Campbell, KY
Mr. Wayne Farmer	ManTech SRA Site Chief	Fort Bragg, NC
MAJ Alexander Froede	Sr. CIMMC representative (ODS) C, Readiness and Fielding Div, CIMMC (currently)	Vint Hill Farms Station, VA

Figure 2-2, Individuals Interviewed

Once the requisite data was collected for each of the specified equipments, two types of analysis were performed as follows:

- The sustainment process for IEW equipment was compared and contrasted to the standard Army sustainment process. This comparison addressed both peacetime and wartime sustainment flows for the maintenance, supply, and materiel distribution processes. In assessing the Army standard processes, the primary focus was on Class IX materiel (repair parts and spares) with emphasis on reparable items.
- The current IEW equipment sustainment process was analyzed for its efficiency and effectiveness. In making this analysis, the study group considered--
 - simplicity

- duplication
- customer satisfaction
- justification of unique requirements
- timeliness (in a qualitative, not statistical, sense)

Equipments and associated sustainment mechanisms were evaluated across the three discrete time periods previously indicated. Key to this analysis was the identification of dysfunctional processes and the linkage to such factors as developers, technology, security, users, etc. In addition, where appropriate, the analysis considered--

- doctrinal compatibility with the needs of product users and the systems acquisition community
- doctrinal compatibility with product technology and organic maintenance capabilities
- rapid deployability of sustainment processes in support of combat operations
- feedback from equipment users, sustainment personnel, acquisition managers, and participating MACOM personnel

Technology of current and future systems was evaluated from a maintenance perspective. This analysis focused on current and future capabilities for embedded fault diagnosis and isolation as well as specific skills necessary to effect actual repairs. A parallel analysis of military occupational specialties (MOSs) in Career Management Field (CMF) 33 was accomplished. The product of this analysis was the comparing and contrasting of the technology bases and military training bases for insights into repair requirements and capabilities in support of future MI technology.

Distribution of spares and support items to using units and the retrograde of reparable items were identified in lessons learned documents as key issues involving IEW support during ODS. Within the area of repair parts, the specific needs of high cost, low density IEW systems were assessed for potential recommendations.

The final product of the analysis is a series of recommendations to modify existing logistics structures or create new ones to streamline IEW sustainment. These recommendations incorporate the impacts of the following:

- *DMRD 904, Stock Funding of Reparables*
- *DMRD 927, Retail and Wholesale Consolidation*
- Integrated Sustainment Maintenance (ISM) concept

- Electronic Maintenance Company concept
- Low Density Syndrome studies
- PEO-IEW Standard Module Open Architecture concept
- reduction of conventional forces in Europe
- base realignment and closures

Chapter 3

IEW SUSTAINMENT ANALYSIS

To gain a full appreciation for the effects of multiple, autonomous support mechanisms on the sustainment of IEW materiel, one must be familiar with the various standard support mechanisms currently in use. Appendixes C and D contain descriptions of the standard Army maintenance and supply structures for comparison with IEW sustainment structures.

Section I - Current IEW Support Flow Overview

Volume IV (classified) contains diagrams depicting the current maintenance support flows for many of the IEW systems under study. The diagrams represent a wide variety of support flows.

Current IEW sustainment is a series of nonstandard support flows using a combination of organic, contract, and mixed resources. In the case of contractor support, contracts are funded and administered by a variety of agencies, including AMC materiel readiness commands (MRC), for which such activity is a primary function, Program/Project Managers (PM) under the various Program Executive Officers (PEO), and other developer-MACOMs (see Appendix G, chart 16IPR-08, Sustainment Organizations). In exploring the reasons for such variety, the study team looked at the acquisition documentation process. Appendix E contains a short description of the documentation process for systems acquisition as it affects IEW logistical sustainment.

IEW maintenance resources are found within a variety of military units and activities as well as within contractor organizations. MI organizations are authorized by tables of organization and equipment (TOE) to perform DS level maintenance tasks on IEW equipment, as well as unit (operator and organizational level) maintenance on all organic equipment (see reference 4). In heavy divisions the authorization to perform DS maintenance is extended to QUICKFIX system EW equipment organic to the command aviation company, TOE 01304L000. Because of Integrated Logistics Support (ILS) decisions, contractors routinely perform unit and DS maintenance, in addition to higher levels, on some systems (e.g., TCAC, TROJAN SPIRIT, HAWKEYE, THMT, etc.).

GS maintenance on IEW equipment is performed by a number of different type units and activities including--

- SIGINT/EW equipment repair teams (GS) (TOE 29630H3GR) generally referred to as "GS maintenance detachments" (Note: these teams are programmed to be replaced in the future force structure by COMSEC/IEW equipment repair platoons [TOE 43549LJ00] to be attached to GS maintenance companies)

- contractor repair facilities (both original equipment manufacturers [OEM] and omnibus contractors, such as CIMMC's existing omnibus contract)

Depot maintenance on IEW equipment is also performed by several different type activities including--

- Government depots
- contractor repair facilities (both OEM and non-OEM)

Section II - Organic Resources

Structure

Organic IEW system support consists of maintenance assets at divisional MI battalions; MI companies of the armored cavalry regiments and separate armored, infantry, and mechanized (AIM) brigades; corps aerial exploitation battalions (AEB); MI battalions of the corps and EAC MI brigades; GS maintenance detachments and equipment repair platoons at corps and EAC levels; and depots.

Divisional and nondivisional MI organizations are generally responsible for unit and DS maintenance on their organic IEW systems. MI organizations perform operator, organizational, and DS level maintenance tasks (i.e., maintenance allocation chart or MAC 10-, 20-, and 30-level tasks) using assigned system operators and Electronic Warfare/Intercept Systems Maintenance (CMF 33) repairers. MOS 33T performs unit and DS maintenance on IEW tactical ground systems (AR 611-201, paragraph 2-13a(1)). MOS 33R and 33V perform unit and DS maintenance on IEW aviation equipment and systems (AR 611-201, paragraph 2-13a(2)).

Within MI battalions organic IEW sustainment resources above the operator level are contained within the communications-electronics (C-E)/IEW maintenance section of the headquarters, headquarters and service company. Such assets are contained within the C-E/IEW maintenance section in the service support platoon of the MI company organic to armored cavalry regiments and separate brigades. These elements have only an internal support function (except for support to QUICKFIX systems assigned to aviation units).

Organic resources for performing GS level maintenance are contained within cellular SIGINT/EW equipment repair teams (TOE 29630H3GR) assigned at corps or EAC levels. EW/I Tactical System Repairers (MOS 33T) are assigned to the detachments to perform GS maintenance (MAC 40-level tasks) on tactical IEW systems. The detachments have only an internal supply function by TOE, but usually maintain a stockage of reparable modules, called line replaceable units (LRUs) or, more commonly, "black boxes," that were provided during the materiel fielding process.

In the future organic resources for performing GS maintenance will be assigned to COMSEC/IEW equipment repair platoons (TOE 43549LJ00) assigned at EAC or, as an exception, corps levels. Such platoons are designed to be attached to GS maintenance companies. These platoons will also have only an internal supply function.

Organic resources for performing depot-level maintenance (MAC 50-level tasks) on IEW systems are contained within various AMC activities such as Tobyhanna Army Depot, Sacramento Army Depot, etc. Organic depot-level maintenance is performed primarily by DA civilian employees.

Because of changes in perceived national security threats due to international political changes, the U.S. Army is experiencing a reduction in size; simultaneously, the Army is required to increase its ability to project combat power overseas in a variety of contingencies. As MI units are removed from the force structure due to the Army's downsizing, the IEW sustainment resources organic to those units will disappear.

The overall requirements for GS level repairers are determined during the Total Army Analysis (TAA) process. Using data on the amount of equipment to be supported and the manpower required to support each system, the TAA process determines the need for specific numbers of GS maintenance assets. The validity of this action depends on the availability and accuracy of data on the density of equipment to be maintained and on the annual maintenance manhours (AMMH) needed to maintain each piece of equipment. This data is supposed to be developed and documented as part of the systems acquisition process (see Appendix E) and follow-on processes (i.e., Manpower Requirements Criteria or MARC).

The study findings suggest that the systems acquisition documentation process is a significant problem area which needs revision. In the past some of the key documentation needed to justify organic IEW sustainment resources has not been prepared in a timely enough manner to ensure that sufficient assets are available at all levels of maintenance to support the systems. For example, there may be an inadequate number of IEW GS maintenance elements in the future force structure because of the lack of sufficient workload data for consideration in the TAA process.

- According to information received during various site visits, the military repairers assigned to the GS maintenance detachments are used primarily to repair nondevelopmental items (NDI) fielded by FORSCOM; however, the workload justifying the existence of those GS maintenance detachments came solely from other (developmental) systems, because the acquisition documentation (e.g., BOIP Feeder Data, QQPRI, BOIP, etc.) has not been completed for the NDI systems.
- The concern is that, when the developmental systems on which the GS detachments' workloads are based have been removed from MI units and are

no longer required to be supported, the justification for the GS detachments will also disappear, despite the continuing need to support NDI systems.

- In addition, Force Modernization systems (such as AN/TRQ-32, AN/TLQ-17A, AN/TSQ-138, etc.) are being transitioned from ICS to support by military GS detachments. Since MARC data was not available, the TAA process was unable to validate GS detachment manning levels. The transition of this Force Mod system workload into a structure already tasked with the unresourced NDI support mission is likely to overburden the organic GS maintenance base.

Although the resources needed to sustain NDI systems were not justified through the normal systems acquisition process, actions to obtain final BOIPs are currently in process, thus permitting the identification and resourcing of personnel to accomplish the GS maintenance support mission for those systems. Although HQDA has indicated a reluctance to expend resources documenting non-objective systems, plans are that at least some current NDI will be in the force structure until 2010; therefore, there is a need to complete the documentation to ensure that adequate sustainment resources will be available.

Because of lack of workload data, the TAA-99 process initially resulted in a reduction of IEW GS maintenance elements from three of the current detachments in FORSCOM and one in USAREUR to one of the future platoons in FORSCOM and one in USAREUR. Perceiving this authorization for a single platoon to be inadequate to support force projection requirements, FORSCOM developed a proposal to reconfigure the platoon's TOE.

- The restructured COMSEC/IEW equipment repair platoon will add ATE personnel and equipment to the platoon while eliminating many separate ATE detachments.
- The proposal would result in manpower savings of over 250 spaces Army-wide.
- FORSCOM recommended four platoons Army-wide, three in FORSCOM and one in USAREUR.

Manning

With the downsizing of the Army and the attendant reduction in the number of 33T positions, the study group analyzed future 33T requirements. Total Army Personnel Command (PERSCOM) figures indicate that CMF 33 will be reduced by over 25 percent over the next three years (FY 93-95) (see Volume III, Appendix AF).

Another major impact on the 33T MOS will begin in the FY 95-98 timeframe as the IEW Common Sensor family of systems reaches the field. These advanced systems will incorporate extensive built-in test/built-in test equipment (BIT/BITE), which will allow operators to diagnosis failures to the circuit card assembly (CCA)

level and to replace a majority of these CCAs. This fix-forward capability inherent with these high technology systems will decrease the requirements for 33Ts at the unit level and change the mix of skills required at each level of maintenance.

Several systems are being transitioned over the next several years from contract to 33T support at both the unit and GS detachment level. This action will require training on these systems for both the unit repairers and the GS-level repairers. At present, CIMMC is considering the transition of several systems, currently maintained by contractors at the GS level, to the 33T at the GS detachment. This action will generate increased workloads at the GS detachment at a time when many of the detachments are scheduled to be downsized or eliminated.

MOS 33R Impact and Responsibilities at the Unit Level

The 33R in QUICKFIX aviation platoons is responsible for the IEW equipment on-board the aircraft. The 33R accomplishes organizational maintenance and evacuates defective modules to the supporting MI battalion C-E maintenance shop, which serves as the QUICKFIX DS, or to the supporting contractor-operated special repair activity (SRA) for units in Alaska and Hawaii.

The 33R in the aerial exploitation battalion performs organizational, DS, GS, and limited depot maintenance. These responsibilities require significantly higher skills than those taught in the basic 33R course and are performed with the assistance of depot representatives and contractors.

MOS 33T Impact and Responsibilities at the Unit Level

The 33T is the primary IEW electronic repairer at the MI unit. The 33T accomplishes all unit maintenance of IEW equipment above the operator level including organizational preventive maintenance checks and services (PMCS), fault diagnosis (both in the field and in the maintenance shop), and repair of equipment.

With available manuals and test, measurement, and diagnostic equipment (TMDE), the 33T diagnoses faults to the LRU-level and replaces the failed item or the next higher assembly. Tactical unit repairers have training in generic repair skills to the component level; however, they are generally restricted from component-level repairs by the MAC and mission requirements. Mission requirements normally dictate the replacement of the black box (LRU) in order to bring the system to operational status in the shortest possible time.

The 33Ts' skills allow use in a task-organized contact team in direct support of forward deployed companies. The 33T can also be deployed to the battalion trains area in support of battalion systems when required. Currently the 33T in a contact team performs fault isolation to the LRU, replaces it with a spare, and evacuates the defective LRU to the C-E/IEW maintenance shop at the battalion. If the LRU is from

TACJAM, TEAMMATE, TRAFFICJAM, QUICKFIX, or one of the common boxes of TRAILBLAZER, it is evacuated to the GS level. Only the five TRAILBLAZER-unique boxes can be diagnosed to the CCA level by the 33T using test interface device equipment (TIDE) to augment common TMDE. The CCA is then replaced and evacuated to depot level.

MOS 33T Impact and Responsibilities at the General Support Level

The 33T at the GS maintenance detachment performs a much different role than the repairer within the MI units. Repair at the GS level is primarily to the CCA and piece part level, depending on the system, and requires greater expertise and a higher level of skill.

There are currently five GS detachments worldwide providing maintenance support to tactical IEW systems. At least four of the five detachments are repairing FORSCOM NDI systems; in fact, NDI systems repair is the only repair work those detachments perform. All other LRUs are transferred for repair to the SRA servicing the detachment (see following discussion of contractor augmentation) or are forwarded to a depot-level repair activity.

A key problem at the GS level is the training provided the 33T prior to being assigned to the GS detachment. With the current grade structure, GS detachments receive a few experienced 33Ts who have both completed the Basic NCO Course (BNCOC) and acquired the necessary GS-level skills. The entry-level 33T normally does not have enough training or experience to be immediately productive in the GS detachment and must go through a local on-the-job training (OJT) program. Experienced maintainers with NCO leadership training have the skills required to provide the needed OJT and must take time from mission repair work to provide the necessary training.

Currently the GS detachments are each organized differently as each supports different mixes of equipment. The equipment mix supported by the detachment consists of fielded production systems and fielded NDI systems within the supported commands. Additionally, a contractor-run SRA is located at the same installation with each GS detachment to support systems that have not fully transitioned to organic support at the GS level. The combination of varying equipment mixes and contractor support requires that the GS detachments' 33T be a versatile, well trained repairer.

Consolidation of CMF 33

Recommendations occasionally surface to consolidate the various CMF 33 MOSs into a single MOS. The current rationale behind consolidation is the projection that the authorized strength of the strategic MOS, 33Y, is being decreased by 48 percent over the next three years. CMF 33 as a whole will be decreased by 28 percent. The factors supporting consolidation of CMF 33 are as follows:

- similarity in technology and configuration for a high percentage of future MI systems (e.g., Ground Based Common Sensor systems, the GUARDRAIL Common Sensor system, Sun work stations, ETUT, THMT, etc.)
- standardization and simplified identification of duty position titles and grade authorizations
- simplified recruitment and personnel management
- reduction in training requirements to one advanced individual training (AIT) course and one BNCOC course
- assignment diversification

A key step in evaluating the consolidation of CMF 33 would be an analysis of theory training as opposed to system-level training. Consolidation would likely result in future CMF 33 repairers being trained almost exclusively on electronic theory as generic maintainers. This action would require that some annex courses on specific systems be provided to soldiers based on their projected duty assignments. The Army personnel management system would have the additional challenge of ensuring that the specially trained soldiers (i.e., those who had received training on specific systems) were assigned to units that had a need for the soldier's particular expertise.

Requirements for the Repairer of the Future

IEW tactical equipment repair personnel will need the following skills on the battlefield of the future:

- common soldier skills to allow survival on the battlefield
- basic electronics background for diagnosis of non-system-specific electronic failures and system failures and for applying training received on one system to other systems
- system proficiency at a higher level than required by the system operator
 - Skills will be necessary to aid in troubleshooting and analysis of system level interoperability with other battlefield systems, commonly referred to as knowledge of the "system of systems."
 - Although the operator of the future may be using sophisticated BIT/BITE to diagnose problems and replace certain CCAs within the system, the DS/GS repairer must be trained beyond this level in order to repair any defective modules designated for repair at that level.

- Sample data collection (SDC) has shown that only 50-75 percent of all failures on current systems can be diagnosed with BIT/BITE and conventional troubleshooting techniques; although this percentage is expected to increase for future systems with more sophisticated BIT/BITE, the abilities of the electronics repairer are expected to be required to ensure high operational readiness rates.

The repairer of the future will need to be more adaptable, more innovative, and more capable of transferring skills from one type of equipment to another. The ability to work in the aviation, tactical, and strategic fields with equal proficiency may be desirable, but decision makers must consider the time required to attain and maintain such proficiency.

Training

With a reduced number of 33Ts available to support the mix of IEW equipment, training will become even more critical. Analysis of the training conducted on current systems has identified several problems that must be addressed for future systems.

- When new systems are fielded, a core of repairers from the gaining unit is supposed to receive training from the New Equipment Training (NET) team. These trained repairers then train the rest of the unit's repairers and all repairers assigned in the future until the sustainment training base begins training the system. The technical information passed from NET trainer to repairer and from senior repairer to junior repairer is an effective approach only if the training base provides trained replacements before the NET-trained repairers depart the unit. After the repairers trained by the NET team depart the unit, the technical proficiency of the remaining repairers tends to decline rapidly.
- Exportable training packages for fielded systems allow repairers to improve their level of skill without leaving the unit or detracting significantly from the operational mission. The training packages made available by the NET teams have proven useful, but are generally a one-time issue; replacement packages are difficult to acquire. In addition, the NET package is based on requirements as viewed prior to fielding. Follow-on exportable training packages should incorporate updates and corrections.
- TRADOC's Systems Approach to Training (SAT) process is structured to be reactive to training requirements identified in the traditional manner, a characteristic that hinders its timely response to rapid technological change.

The developmental process for systems includes identification of critical tasks for repairers, and allows TRADOC participants to identify new or different tasks that must be trained. Resource and other constraints may prevent these critical tasks from being fully incorporated into training courses resulting in a training shortfall.

School training on GS-level maintenance for specific IEW systems exists only for TRAFFICJAM. During development, GS-level training tasks are identified for each system; however, GS-level training for other IEW systems has not been fully implemented.

CMF 33 contains the MOSs for IEW systems maintenance including the IEW tactical systems repairer (33T), the IEW strategic systems repairer (33Y), the IEW avionic systems repairer (33R), the IEW aerial sensor repairer (33V), and the IEW systems maintenance supervisor (33Z). These MOSs were split out from the former IEW systems repairer (33S) in the mid-1980s.

Over the last 20 years, lengths for CMF 33 courses have varied from 25 to 49 weeks. The first 20 weeks of all four courses (in accordance with FY93 planning documents from the U.S. Army Intelligence School Devens or USAISD) include common Basic Electronics Training using an advanced computer-assisted program and hardware called the Basic Electronic Maintenance Trainer (BEMT). The remainder of each course contains system-specific training on the equipment each MOS will repair.

The courses are designed to produce a basic electronic repairer capable of organizational and direct support maintenance tasks. The current and new course lengths are:

<u>MOS</u>	<u>FY 92 Length</u>	<u>FY 93 Length</u>
33T	32 weeks 1 day	35 weeks 1 day
33R	36 weeks	42 weeks 3 days
33Y	40 weeks 3 days	43 weeks
33V	41 weeks 1 day	43 weeks

The TRADOC philosophy for training CMF 33 has also varied over the years. Sometimes training has included specific equipment, and sometimes the training has been independent of equipment. When training has been independent of specific equipment, units have been expected to provide OJT for the systems within the unit. TRADOC has never had the authorized resources to train repair personnel on all possible systems they might encounter in a field environment; nor is it considered feasible to extend the soldier training cycle to cover all possible systems.

All formal school courses are developed using TRADOC's Systems Approach to Training (SAT) model. This process may require up to three years from start of the analysis, through design and development, to actually teaching the target personnel. Training development is accomplished after-the-fact; i.e., after the system has been fielded. Because of problems in systems acquisition planning and documentation (see Appendix E), NDI systems are often not supported by institutional training. Because of the normal length of the SAT process and the fact that training development is accomplished after the system has been fielded, the SAT process is not responsive to the rapid changes in technology that characterize the electronics area.

Feedback from a number of units indicated that more training is needed in supply procedures. Despite the unique nature of IEW parts resupply procedures, IEW maintenance personnel receive almost no formal training in supply procedures.

- Due to the low density, critical nature of IEW systems, supply procedures for IEW repair parts and spares are nonstandard. Parts are often obtained through a stovepipe supply structure established by the system's materiel developer or materiel sustainment supporter.
- IEW repair parts which have not been assigned a National Stock Number (NSN) and must, therefore, be ordered using manual, part number requisitions are seldom received without intensive management and intervention through the supply system. Part number requisitions are often cancelled due to non-identification by one of the automated supply systems through which they must flow.

Furthermore, the S4 officer in most MI battalions is from the MI branch rather than the Quartermaster Corps. While this arrangement allows an MI officer the opportunity to learn supply procedures, it deprives the battalion of needed logistics expertise.

Section III - Contractor Augmentation

Although the preferred support structure (according to AR 750-1, paragraph 3-1i) includes organic unit and DS maintenance for all systems, contractor augmentation is often used, especially for GS and depot support, but occasionally for DS and even organizational level as well. According to AR 750-1, paragraph 4-25, contractual support for MTOE unit equipment is generally limited to short-term tasks such as--

- expedited fielding
- awaiting development of in-house capability
- temporary periods of high workloads
- special overhaul or modification requirements

There are a number of reasons why it is not always feasible to establish a system sustainment plan that includes soldier maintainers at the DS and GS levels such as--

- short expected life cycle of the system
- lack of access to OEM proprietary information

- technical skills requirements
- high cost of organic versus contractor sustainment

Quick reaction systems are fielded on an accelerated timetable with the expectation that the systems will be replaced with production (developmental) systems, resulting in a short expected life cycle. Full production logistics and training are not cost effective nor possible in the short time frame available with the typical quick reaction system. Without full production logistics, organic support is difficult, if not impossible, and contract maintenance becomes necessary for the life of the system.

Without procurement of a full technical data package necessary for effective sustainment (e.g., detailed theories of operation, schematics, manuals, test software, etc.), details of the system's operation, maintenance, parts, and other items may not be available for the Government to provide to organic system maintainers. By default the OEM contractor becomes the system maintainer as well as manufacturer.

Sometimes systems require technical capabilities that are not available to organic repairers. These capabilities could include test capabilities, TMDE, technical skills, and time to troubleshoot and repair the system. Some equipment requires TMDE that is not available at one level or another; some equipment requires specialized ATE; some equipment requires several days of testing to isolate the fault; and some equipment requires skills that are not provided to Army repairers.

For some systems it is not economically feasible to procure a technical data package sufficiently detailed to transfer sustainment to organic support. When economic concerns dictate reliance on contractor maintenance, the system will normally be sustained with life cycle contractor logistics support (CLS).

Interim Contractor Support (ICS)

ICS provides all or part of a materiel system's support by contract for a specified interim period after initial deployment pending the development of an organic support capability (reference: DA Pam 700-55). ICS is supposed to be a temporary solution to a sustainment requirement. Considering the need for expedited fielding, ICS may be the optimal method of supporting new IEW systems for a number of valid reasons such as the following:

- incomplete provisioning of spares, TMDE, etc.
- incomplete documentation
- delayed completion of test program sets (TPS)
- insufficient time to train or otherwise develop organic support resources

Although generally provided by the OEM contractor, ICS may be provided by omnibus contractors.

Contractor Logistics Support (CLS)

In contrast to ICS, which is expected to be only temporary, CLS is the provision of all or part of a materiel system's logistic support by contract throughout its life cycle (reference: DA Pam 700-55). Because of the rapid development of new electronics technology, it may not be feasible to develop an organic capability to sustain a particular system for a relatively short life cycle. AR 700-127 indicates that CLS should be considered the permanent solution to a sustainment requirement only when a Cost and Operational Effectiveness Analysis (COEA) determines that CLS is the most cost-effective method of support considering both peacetime and wartime requirements. Thus, at the present time, CLS is doctrinally valid when all requirements for comparison of the various sustainment methods have been satisfied.

Although the materiel developer is responsible for funding ICS for a system, the MRC is generally responsible for funding CLS. Thus there is an urgent need for close coordination in any case in which system sustainment is scheduled to transition from ICS to CLS.

Contractor Support

Often the contractor support option is the result of a series of compromises rather than deliberate decisions which determined that contractor support was the best manner of providing system sustainment on a permanent basis.

- Because of pressures to field a system before completion of all Total Package Fielding requirements, users sometimes accept conditional release (see DA Pam 700-142) of the system from the developers prior to completion of all Integrated Logistics Support Plan (ILSP) items. Often the pressure can come from the user command itself, which would prefer at least a limited capability as soon as possible rather than wait for full release.
- Although ICS may be included in the ILSP as a temporary part of system sustainment, there are occasions when ICS is used only to expedite conditional release. Conditional release requires that the materiel developer prepare a get-well plan addressing each condition which precludes full release. Problems usually arise when materiel developers fail to follow up on get-well plans and complete all actions required for full release.
- Availability of ATE and TPSs at the time of fielding will often dictate use of contractor support for at least part of the system life cycle.

- A projected shortage of technical personnel to maintain the system has resulted in the continuation of ICS in the past. Without qualified maintenance personnel in the correct locations, full organic capability cannot be attained. Organic support could replace contractor support relatively quickly if the Army were able to respond rapidly by adjusting personnel requirements and by training additional repairers to replace the contractors.

Regardless of the original, perhaps temporary, rationale for contractor support to a system, there are valid reasons for relying on contractor sustainment of IEW materiel as a permanent solution, such as--

- the need for rapid technology transfer
 - The pace of technological advancement in the electronics area has been very rapid. Major investments in training, TMDE, facilities, support equipment, etc., are often required when systems incorporating new technologies are developed and/or fielded.
 - Considering the rapid pace of technological change, sustainment proponents will tend to rely on resources that have a high probability of success in providing the necessary skills and expertise for materiel sustainment. Often the best source of such expertise for new technologies is the OEM that built the system. Even non-OEM contractors often have more flexibility for facilitating the transfer of new technologies than does the organic depot system, which may be constrained by such factors as hiring freezes, budget shortfalls, and the workload of sustaining a wide variety of fielded systems.
- flexibility
 - Depot repair programs are primarily geared toward assembly line work flows of large quantities of items for repair and return to the supply system; however, most IEW systems and spares are of such low density that production line repair programs would not be feasible. ICS/CLS provides flexibility that is not available through the organic depot system. A contract can be set up to provide repair and return of serially numbered items to the owning customers; such contracts should be considered as a standard practice for IEW sustainment.
 - Contractors have more flexibility than do Government activities in purchasing needed supplies and spares as they are less constrained by the Federal Acquisition Regulation (FAR). If required items are not expected to be available within the supply system within 60 days, contractors are authorized to purchase the items locally without obtaining an exception to policy; however, Government activities must obtain an exception to policy under such circumstances. Although the time required to request and secure an exception to policy varies by

command, any delays are likely to have adverse effects on materiel readiness.

- **competitive pricing**
 - Sustainment proponents can take advantage of price competition through the use of omnibus contracts.
 - There would be no price competition if DESCOM support arrangements were all that were available.
 - The availability of a number of competitive, non-OEM contractors, generally ensures that sustainment maintenance can be accomplished at the most favorable price to the Government.
- **lack of field or depot maintenance capabilities**
 - New technologies include multilayer circuit card assemblies (CCA). Troubleshooting multilayer CCAs requires extensive skills, equipment, and time. These CCAs, some containing as many as 16 layers of material, require specialized capabilities that are not available to organic repairers and must be returned to a contractor facility.
 - Many systems have no specialized ATE or TMDE available at the time of fielding, resulting in a requirement for system test beds (so-called "hot mock-ups") for testing and troubleshooting the equipment. The scarcity and expense of hot mock-ups make it difficult to authorize and procure them for organic support units. A contractor can be expected to provide all system repairs using a minimum number of hot mock-ups; however, reliance on organic support would require a greater number of hot mock-ups to equip the number of TOE maintenance units in the force structure.

Of the 38 IEW systems being reviewed during this study, at least 27 have some level of contractor sustainment support. Of the other 11 systems, eight are supported with organic resources through depot level, and three are future systems for which support is expected to be organic.

Special Repair Activity (SRA)

CIMMC currently manages a contract providing regional sustainment maintenance support for tactical IEW systems (see reference 8). At three CONUS and two overseas locations, a single omnibus contractor provides ICS for those systems that are specified in the statement of work. (Note: Although called "SRAs," these activities are not "specialized repair activities" in the AR 750-1 sense; they are an augmentation provided by CIMMC to the GS maintenance detachments.) The SRAs provide ICS (interim support) rather than CLS because the systems being maintained

by the SRAs are scheduled to transition to another form of support in the future. The systems included in the scope of this study that are currently supported by the CIMMC SRA contract include--

- CEFIRM LEADER
- QUICKFIX
- TACJAM
- TEAMMATE
- TRACKWOLF
- TRAFFICJAM
- TRAILBLAZER

Future additions to the list of systems to be supported under the CIMMC SRA contract are expected to incorporate the following systems included within this study:

- Common Sensor Programs
- TCAC

The omnibus contract created SRAs with the following characteristics and/or capabilities:

- a single contractor
- a single facility per geographic area
- area or specific unit support responsibility
- maintenance
 - all levels (unit to limited depot as required)
 - specified systems by line item number (LIN)
 - OEM repairs
 - technical assistance forward
 - quality control/assurance

- supply
 - wholesale system access
 - local purchase authority
 - storage of spares and replacement parts
- packing, packaging, and transportation
- modification work order (MWO) installation
- support for fieldings and training exercises
- system calibration support

Most of the SRA facilities are collocated with SIGINT/EW GS maintenance detachments to provide optimum customer service and mutual support.

Section IV - Deployment Issues

The recent deployment of U.S. forces to Southwest Asia (SWA) offers many prime examples of the issues and challenges facing the logistics community in the support of IEW equipment. ODS identified many of the challenges that surface when attempting to support low density systems, both NDI and developmental. After action reports identified numerous problems resulting from the requirement to deploy sustainment resources and provide support for IEW equipment in an overseas theater during a combat situation. The problems inherent in using different structures and procedures in wartime than in peacetime quickly surfaced and provide a background for the evaluation of support for the deployment of IEW equipment to SWA.

Most of the IEW systems in the field today are supported by a combination of soldiers and contractors, with the soldier support primarily at the unit level and contractors supporting systems at the GS level and above. This combination of organic and contractor support has led to a proliferation of support channels and concepts.

Preparations for Deployment to SWA

The challenges in supporting IEW systems actually began prior to deployment for many units. Once alerted for deployment, units were required to begin making decisions on what support equipment and spares would be needed in support of operations. Units with experience deploying beyond local training areas found the decision process much easier than those without this experience. GS IEW

maintenance detachments, which seldom, if ever, practice deployment, were at a distinct disadvantage. Major deployment issues were as follows:

- A number of MI units deployed without a full set of spares and TMDE due to the lack of sufficient lift capability or the decision not to take the full complement of spares and equipment. The lack of lift capability has been recognized as a shortfall in the recent past, but, because Operations URGENT FURY and JUST CAUSE were of relatively short duration and low intensity, ODS is the first recent conflict in which lack of lift has had a significant adverse impact on MI units.
- The GS IEW maintenance detachments did not have a full set of TMDE, vehicles to transport maintenance vans, and, in some cases, did not have maintenance vans. An additional challenge for the GS detachments involved the IEW spares assigned to the corps. In one case the spares were stocked by the detachment and were included in the deployment. In another case the spares were stocked by the supporting SSA, which deployed a cell with IEW spares to accompany the GS detachment. In still another case, the GS detachment signed for the IEW spares from the SSA prior to deployment and then deployed with the spares.

Deployment to SWA

Shortly after the onset of ODS, CIMMC deployed a contractor cell to SWA in support of the anticipated deployment of MI units. CIMMC established SRA I, designated the Rainbow SRA, in Dhahran for support of equipment arriving in SWA. Beginning with a single location, the Rainbow SRA provided forward-deployed GS maintenance, limited depot maintenance, a link with wholesale item managers to identify critical requirements for spares, and a system to track and expedite requisitions. Eventually, two additional Rainbow SRAs, SRA II and SRA III, were established in SWA to support the increased troop strength and density of equipment. The assets that comprised the Rainbow SRAs were provided from organic CIMMC assets and from CIMMC's contractor-operated SRAs (see Section III). During the course of ODS, at least some of each of the following resources were collocated at the Rainbow SRAs providing support to MI units:

- GS IEW maintenance detachments
- Automated test equipment (ATE) detachments
- CECOM IEW LARs

Three GS IEW maintenance units eventually were deployed to SWA in support of ODS: the 158th IEW Maintenance Detachment from FORSCOM, the 159th IEW Maintenance Detachment from FORSCOM, and the 263d Maintenance Company (with

IEW GS maintenance capability) from USAREUR. Each of these IEW elements arrived with a different mix of equipment and support capabilities.

- The capabilities of the 158th IEW Maintenance Detachment included repair of FORSCOM NDI systems and DS backup for units on standard systems. The 158th was the only unit with expertise in the repair of the DRAGONFIX NDI system. When the 158th prepared for deployment to SWA, they incorporated the IEW stocked items from the Ft. Bragg SSA into their uploaded equipment; therefore, the 158th had spares for standard systems and NDI systems.
- The capabilities of the 159th IEW Maintenance Detachment included repair of FORSCOM NDI systems (less DRAGONFIX) and some GS level repair of standard systems, along with DS backup. The 159th's equipment included a hot mock-up for the AN/MSQ-103 and all of their organic vehicles, generators, maintenance vans, and TMDE. The 159th held the SSA stocks of IEW spares at Ft. Hood and deployed with these spares.
- The 263d Maintenance Company had almost no repair capability for standard systems and no experience repairing FORSCOM NDI systems. The 263d arrived in SWA with very little of their TMDE, organic vehicles, generators, or maintenance vans. The 263d performed in Germany as a pass-through unit to the CIMMC SRA at Pirmasens with little or no maintenance responsibility, and, when they arrived for ODS, they lacked much of the training needed to repair systems. The unit did deploy with a support cell from their SSA that collocated with them and provided IEW spares for using units. The combination of SSA spares and the 263d provided the same type and quality of support for ODS as they had been providing in Germany: i.e., primarily pass-through support to the SRA.

IEW Maintenance Operations in SWA

The IEW GS maintenance units initially deployed to the SRA I location and provided support and spares in conjunction with SRA I. The combination of the IEW GS detachments and SRA I provided units arriving in SWA with a single-location support structure which included spares and the capability for repair of all IEW systems.

SRA I provided the initial maintenance for many of the IEW systems as they arrived in theater. SRA I was able to improve the initial materiel readiness of IEW systems by providing detailed technical inspections of each unit's equipment as the unit arrived in the theater. These actions ensured that, as units moved forward from their initial assembly areas, systems were at a high degree of readiness. This capability was available only for systems supported by the CIMMC SRA and the FORSCOM NDI systems.

The three SRAs (SRA I at Dhahran, SRA II at King Khalid Military City (KKMC), and SRA III at Riyadh) provided the following support during ODS:

- SRA I personnel performed maintenance using the hot mock-ups and TMDE available for standard systems. SRA I accomplished very little NDI repair. The SRA intensively managed the flow of supplies and parts into and out of the theater. In addition SRA I provided logistics support to the other IEW SRAs and occasional forward mobile support teams (MST) for site visits. The MSTs supported standard systems with limited NDI support.
- SRA II deployed to KKMC to provide forward maintenance support and DX support for MI units. They also provided MSTs on a regular basis to MI units within their support area. SRA II provided forward analysis and repair of LRUs and evacuated all LRUs and CCAs beyond their capability, either due to skills, TMDE, or hot mock-up availability, to SRA I. After supported units advanced northward, several of the hot mock-ups were moved to SRA II's location to provide additional forward repair capabilities. SRA II primarily supported standard systems with limited NDI support.
- SRA III deployed in support of EAC assets but performed limited amounts of maintenance. The SRA personnel were limited in their capabilities by a lack of proper security clearances, TMDE, manuals, and experience with the equipment. SRA III performed primarily an evacuation function supporting one standard system and several NDI and non-standard systems at the EAC level.
- The SRAs were eventually set up with SRA I and SRA II providing regional support to the eastern and western areas, and SRA III providing support to EAC equipment. As ODS developed, SRA II became the central support activity with very few units traveling to SRA I for support. SRA I then became the back-up for SRA II as well as the primary logistics and supply activity for the SRAs.

By default the theater Army (ARCENT) G2 held primary staff responsibility for support of IEW systems, which included responsibility for development of an IEW Sustainment Plan. The resulting IEW Sustainment Plan addressed several major problem areas in support of IEW equipment and attempted to document and implement solutions for those problems such as the following:

- The IEW Sustainment Plan identified the need for transportation support from the logistics community in support of IEW maintenance, specifically air transport support. Sustainment activities continued to experience transportation shortfalls, finding air support difficult to arrange and not responsive to the needs of IEW sustainment. The immediate solution to this shortfall was to assign SRA contractor personnel the responsibility for transportation support between SRAs. In peacetime the units, GS detachments, and SRAs use government shipping and the U.S. mail for transportation of spares and support items. During ODS the government system in-country could not provide the timeliness required.

- The IEW Sustainment Plan identified a need to realign the IEW support structure of the two corps to provide the best overall IEW support to the theater. The plan called for regional support of all units, but the corps G4s wanted to maintain their corps-oriented support. The realignment required the corps to give up control of their IEW GS maintenance assets, so the entire theater could be supported in a more efficient manner. Both corps refused to release their assets and continued to move their units forward when the corps GS units moved forward. Eventually the IEW maintenance detachments were located where they would provide the best support for the entire theater. The MI units, SRAs, and the GS IEW detachments actually employed a regional support concept despite the obstacles imposed by the corps. During peacetime the Army rarely exercises theater level support for IEW systems which would require the integration of multiple corps' assets.
- The IEW Sustainment Plan identified a need to consolidate and streamline under one structure the support for standard systems, FORSCOM NDI systems, and non-FORSCOM NDI systems, to include EAC systems. The only equipment sustainment that was planned to be outside this support structure was that for the TENCAP systems. This structure would have allowed for an economy of effort in logistics and supply support, along with providing units with a single point of contact for support. This structure was never implemented as the individual support contractors and PMs continued to maintain their systems with their own stovepipe support systems. The PMs did not want to transfer sustainment of their systems to a new structure at a time when battlefield performance was critical. Peacetime streamlining of IEW sustainment has occurred only in regard to the consolidation of ICS for the major CIMMC systems under an omnibus contractor, and has not included FORSCOM and EAC systems.
- The IEW Sustainment Plan identified a need for contractors to go forward of the corps rear boundary. Although by regulation contractors were not to proceed forward of the corps rear boundary, it was identified early in ODS that, to maintain system readiness, field new and improved systems, and provide sustainment for CLS systems, contractors must be permitted to proceed forward of the corps rear boundary. Authorization was granted which allowed support to forward units. The Army must recognize this need and incorporate the authority into doctrine.
- The IEW Sustainment Plan identified a need for theater support in the areas of communications equipment, tactical transportation, and personnel support for in-theater contractors. Because the SRAs were assigned to CECOM and CECOM was an AMC asset reporting through the senior AMC representative in theater to HQ AMC in CONUS, there was no in-theater attachment to a specific unit. This fact resulted in the SRAs fending for themselves without a unit directly sponsoring and supporting them. The plan recommended the attachment of the AMC activities to the theater support command, which would then have a direct hand in the employment of the SRAs and also would

provide for the support of personnel. The current environment with multiple support contractors operating independently makes it difficult to attach each contractor and activity to an individual unit. Consolidation and streamlining simplifies the attachments required, and, if AMC activities are then attached to the senior theater logistics organization, an integrated support structure could emerge.

- The IEW Sustainment Plan identified a need to consolidate and move the main SRA support forward from SRA I to SRA II. This change would have meant the movement of all the hot mock-ups and some personnel from SRA I to SRA II. The SRA I site chief was reluctant to comply without company approval from CONUS, even after being directed by the in-country ACOR (assistant contracting officer's representative). Eventually some equipment was moved forward, and SRA I personnel were temporarily sent forward as contact teams. This reluctance to follow government direction resulted from the SRA contractor sites being independent activities during peacetime, only responsible to company headquarters. Integration and responsiveness across the battlefield would require the presence of company personnel who are authorized to respond to the government quickly.

Many of the problems that occurred during ODS and that were addressed in the IEW Sustainment Plan developed because the intelligence staff (G2) was planning for the sustainment of IEW systems rather than the logistics staff (G4). This problem has occurred for many years because IEW sustainment has been outside of the standard Army system; even when brought into the standard Army system, IEW sustainment has been driven by the G2 staff. The G4 has often been content to leave the sustainment of IEW in G2 channels because of a lack of understanding of how IEW systems are supported. Because the G4 does not control IEW sustainment in peacetime, there is no one on the G4 staff that understands the problems, and the sustainment of IEW equipment is rarely addressed in logistics planning. The G4 staff should have either an IEW staff officer with logistics experience or an IEW maintenance warrant officer assigned to the staff to assist in planning IEW sustainment.

Sustainment Successes in SWA

Sustainment of IEW systems in SWA experienced many successes. The MI battalions experienced their highest readiness rates for IEW systems during ODS due to an intense effort by all concerned. Other reasons that contributed to this success are listed below:

- Collocating GS maintenance detachments with the Rainbow SRAs reduced turn-around times on repairs.

- Numerous push packages of spare IEW modules were sent to the Rainbow SRAs; this forward positioning of depot stocks greatly shortened repair times by reducing the time awaiting the supply of necessary spares.
- SRAs helped maintain high levels of IEW system readiness by quickly repairing or replacing failed LRUs and CCAs.
- SRA I was able to improve the initial materiel readiness of IEW systems in SWA by providing detailed technical inspections of each unit's equipment as it arrived in the theater.
- IEW LARs were of great assistance in identifying units requiring support and in transporting spares and replacement parts.

IEW Sustainment Challenges from ODS

ODS experience also identified many areas where additional planning and support are needed to sustain IEW systems on the battlefield. It was clear from the problems experienced by the units, IEW GS detachments, and SRAs that there is a real need to train as the force will fight. Some of these challenges are listed below:

- The corps do not want to give up support units. If the IEW GS maintenance detachments need to be task organized during deployments, the unit should train that way during peacetime. In this way the corps staff would gain an understanding during peacetime of why and how this task organizing must be done to support wartime operations.
- The IEW GS maintenance detachments did not have the capability to perform their full mission. The detachments needed additional transportation assets, TMDE, personnel, and training. One detachment was capable of NDI repair and no repair of standard systems, another was capable of both NDI repair and some standard system repair, while, on arrival in theater, the third GS element could repair nothing. The detachments have no organic technical supply capability, several do not have all the TOE equipment they are authorized, and none have all the training they need to support standard systems.
- Support was fragmented as the IEW GS detachments supported FORSCOM NDI equipment but not many standard systems, the SRAs supported the standard developmental systems, and there was no overall support scheme for non-FORSCOM NDI systems, as each had its own unique structure. The problems that developed are illustrated clearly in two specific examples:
 - When the IEW GS detachments deployed forward with the corps GS units, they provided LRU exchange for standard systems and support for FORSCOM NDI systems, but could not repair LRUs from the standard systems. Additionally, some unique support (e.g., DRAGONFIX) moved

forward with the GS detachments despite the fact that such support was needed in other areas. The SRAs, which did not move forward, had little capability and no spares for support of the FORSCOM NDI systems. Since none of the GS detachments provided a repair capability for all the systems, customer units often traveled to a detachment only to discover that they had to go to an SRA for the required support. Forward deploying an integrated team of GS maintainers and contractor personnel would have provided more effective forward support for most IEW systems.

- SRA III was designated to support EAC units and equipment, primarily non-FORSCOM NDI systems. Due to the lack of manuals, parts, and familiarity with the equipment, the SRA primarily served as a shipping and receiving facility. One of the systems SRA III was designated to support was CEFIRM LEADER. The support contractor for CEFIRM LEADER would not deploy to SWA, so the SRA had to assume the support responsibility. This system continued to experience problems throughout ODS as the assigned soldiers and the SRA III personnel attempted to support the system.
- Communications between supported units, the GS detachments, and the Rainbow SRAs were difficult. The SRAs had no organic military communications and had to rely on assets provided by host units and CECOM. This issue illustrates several problems, but relates directly to the lack of a planned logistics support net and the need for organic communications for the logistics communications net.
- Several units deployed without a full complement of spares and TMDE which limited the units' support capability and required the SRAs to support equipment which normally is repaired organically. One specific shortage in the units was the TIDE repair sets for TRAILBLAZER. No TRAILBLAZER unit deployed with the TIDE sets; therefore, the SRAs were required to assume all support for the LRUs normally repaired by the units with the TIDE sets. The SRA contract required modification to authorize them to procure spares and repair these TRAILBLAZER LRUs.
- Several INSCOM tactical units initially experienced substantial logistics support problems because their normal support channels were through HQ, INSCOM instead of through standard Army logistics channels.

ODS Support for Non-IEW Materiel

The Army learned many lessons during ODS regarding logistic sustainment of high cost, low density, critical items in a situation requiring power projection. Perhaps the most important was the idea that, to ensure proper and timely support, a structure must exist that does not depend upon the early deployment of Reserve Component GS maintenance units, which historically have not been deployed to a theater in the early stages of development. During ODS an organization, called the U.S. Army Support Group (USASG), was created on an ad hoc basis. According to paragraph IIIc(1) of ODCSLOG pamphlet, Operation DESERT STORM Sustainment--

The USASG, established by the Army Materiel Command (AMC), operated as the key means to project the wholesale system into the Southwest Asia (SWA) theater of operations, and to manage contract maintenance support. The USASG was organized using Depot Systems Command (DESCOM) assets as a theater-unique support element tailored to provide selected GS and depot level repair. It was formed to provide supply and maintenance support for deployed forces in Operation DESERT SHIELD. In supply areas, the USASG was charged with the management and distribution of high dollar, high-tech, low-density items; shortening and reducing the amount of materiel in the supply pipeline; and retrograde movement. In maintenance areas, the USASG was structured to provide the highest level of maintenance practical in the forward areas....The performance of AMC depot personnel and the commodity commands' logistics assistance representatives (LARs), backed up by contract maintenance support personnel, was a key link in maintaining the readiness of our newer high technology weapon systems.

Consisting of DA civilians, contractors (U.S. and allied), military with unique skills, and Reserve Component TOE organizations, the Army Support Group proved to be a flexible, tailorable organization which provided valuable support to the theater commander.

To provide solutions for many of the problems encountered during ODS and to institutionalize the advantages that resulted from AMC's deployment and use of the Army Support Group concept, AMC and CASCOM are coordinating on the development of several concepts. Three concepts are currently being studied and integrated together (see Section VI): a new Logistics Support Group (LSG) concept to facilitate management of forward deployed theater sustaining base assets, an Integrated Sustainment Maintenance (ISM) concept to integrate sustainment maintenance under a single national manager, and the Forward Repair Activity (FRA) concept providing a forward based, highly responsive, rapidly deployable, limited depot and backup intermediate support maintenance capability. Each of these concepts addresses areas of weakness in the sustainment base during ODS.

Section V - Stock Funding of Depot Level Repairables

The supply of spares, including so-called "black boxes" or reparable modules, was cited by numerous units visited and in ODS after action reports as perhaps the most pervasive problem with the supportability of IEW systems. Most of the problems stem from the low density, high cost nature of the systems and spares. A change in the way units obtain depot level repairables came about on April 1, 1992. To understand the significance of this issue requires awareness of the concepts of consumer funds, stock funds, and depot level repairables.

Consumer Funds

- Units use funds which are appropriated by Congress for one year and are called "Operations and Maintenance, Army (OMA)" or "operating" or "consumer" funds. OMA funds are mission funds used for clearly defined purposes. "Any item of supply, excluding supply class VII (end items), placed on request to the supporting DSU uses these funds, and the unit's funds are decremented by total cost of the materiel" (paragraph 2-2b, AR 710-2).
- DS and GS activities use funds which are appropriated by Congress for one year and are called "Operations and Maintenance, Army (OMA)" or "operating" or "consumer" funds. "OMA funds...are mission funds used for clearly defined purposes. Requests for items of supply from customer units are funded by these funds. Any item of supply (less supply class VII) placed on requisition by DS/GS activities are funded with OMA funds" (paragraph 3-2i, AR 710-2).

Stock Funds

- The Army Stock Fund (ASF) is a working capital fund designed to acquire, hold, and issue inventories of materials.
 - The stock fund concept is that of a revolving fund with a generally fixed capitalization. As sales to customers are made, reimbursements are returned to the fund for reuse in a manner that will maintain the fund principal or corpus. The operation of the stock fund cycle requires customers to reimburse the fund by using available consumer (appropriated) or other funds. Therefore, the amount of supplies ordered by users is normally controlled by the amount of appropriated funds available to them (reference ALM-61-4860-H(B)).
 - Originally the stock fund was used to finance the acquisition and retention of bulk, common usage, consumer-type items.
 - At present the ASF consists of a wholesale division operated by AMC and retail divisions operated by MACOMs.

- The AMC wholesale division's customers are the various retail divisions.
- The retail divisions, through their installation-level branch offices, deal directly with customers who acquire materiel from the stock fund by using their consumer funds.
- DMRD 927 calls for a single stock fund, a combination of the wholesale and retail levels. Customers will still have to use consumer funds to acquire items from the ASF; however, combining the retail and wholesale levels of the ASF is expected to have the following benefits (reference briefing, SLA, Single Stock Fund):
 - centralized asset ownership and visibility
 - enhanced redistribution and acquisition of assets
 - consolidated financial and inventory accounts
 - elimination of automated systems and processes with duplicative functions

Depot Level Reparables

Depot level reparables are secondary items (repair parts and major assemblies as opposed to end items) that can generally be restored to a serviceable condition after becoming unserviceable. Whether or not lower level repair is authorized, depot level reparables are not authorized for disposal below depot or specialized repair activity level.

Prior to 1 April 1992, depot level reparables were paid for out of the secondary item Procurement Appropriation (PA2) and were issued to customers without charge to the customers' consumer funds. As a result of DMRD 904, customers are now required to budget and pay for depot level reparables. The rationale for this change was primarily as follows:

- free issue was not cost-effective
- there was no encouragement to repair at unit level
- there was no real incentive to return unserviceables to be repaired

In the past MI units have tended to use nonstandard methods of acquiring depot level reparables (reference various site visit reports). These methods have resulted in the lack of appropriate demand data with which to justify consumer fund budgets for depot level reparables under the new requirements. Instead of using a

reparable exchange (RX) transaction, which would have resulted in simultaneous supply actions to turn in the unserviceable reparable for repair and request a serviceable item for replacement, supported and supporting units alike have tended to rely upon repair and return of the unserviceables. Because of the high dollar value and low density of the typical IEW depot level reparable, MI units have dealt directly with GS maintenance detachments to obtain repaired assets, thus bypassing the DS SSA, which would at least have recorded the demand for a serviceable item so that a record would exist.

The high cost and low density of many IEW spares imply the following:

- MI units will attempt to minimize their expenditure of consumer funds by repairing (or obtaining repairs for) unserviceables rather than ordering replacements whenever possible
- MI units will attempt to increase their ability to repair unserviceable items (such as through improved test equipment and procedures)
- MI units need improved fix-forward capability including--
 - increased skills training
 - test equipment that will permit fault-isolation to CCA level or below
 - appropriate tools
 - sufficient numbers and types of spare modules
 - adequate organic lift capability to move maintenance assets (e.g., spares, tools, TMDE, etc.)

DMRD 904 should result in--

- an overall decrease in demands and expenditures for depot level reparables per system
- an increase in the percentage of total unserviceable items being turned in by MI units for repair and/or an increase in repairs carried out at MI unit level

Section VI - Integration of Resources

For a number of reasons, the current structure supporting the sustainment of IEW systems can be described as a series of multiple, relatively autonomous, support mechanisms. Often called "stovepipes," some of these mechanisms reach from the wholesale level to customer units with little, if any, interaction with other support structures, even where obvious economies could be gained through consolidation or

integration. In exploring the rationale for this situation, the study group identified several recurring reasons such as--

- the tendency for a developing agency to rely almost exclusively on ICS using the OEM contractor to provide the initial sustainment support in an effort to field the system expeditiously (reference 3)
- involvement of a number of different combat and materiel development agencies with the potential for creating a unique sustainment structure for each individual system
- the likelihood that agencies are not following prescribed acquisition documentation procedures which are required even for NDI acquisitions (see Appendix E)

The systems acquisition process calls for the support structure elements to be acquired concurrently with the system so that the system will be both supportable and supported when fielded (DOD 5000.2, Part 7, Section A, Integrated Logistics Support). "Whether driven by expediency, funding constraints, incomplete staff work, incomplete contractor performance," or other reasons, developers are fielding systems with ICS and/or CLS to fill gaps in Integrated Logistics Support (ILS) (reference 3). Although paragraph 4-25, AR 750-1, limits CLS to short-term tasks, Army activities have tended to perpetuate CLS without evidence of valid justification through a COEA.

The following sections describe several emerging concepts aimed at the further integration of sustainment resources.

Logistics Support Group

Experiences in operations DESERT SHIELD/STORM as well as URGENT FURY and JUST CAUSE have helped identify the need for a tailorable, flexible organization that can provide wholesale level support to overseas theaters during a contingency operation. AMC and U.S. Army Combined Arms Support Command (CASCOM) have collaborated on the Logistics Support Group concept based primarily on lessons learned from these recent conflicts including the use of the Army Support Group in SWA.

During ODS the Army Support Group (see Section IV) performed the following tasks among others (reference CASCOM memorandum, ATCL-CLE, 12 March 1992, subj: Logistics Support Group Concept):

- component repair up to depot level
- redistribution of serviceable and unserviceable secondary items

- repair and provision of components to support the RX program
- equipment retrograde
- oversight and administration of contracts for forward repair activities
- special projects such as M1A1 tank modifications

Additional functions that have been identified as appropriate for the LSG include--

- aviation logistics
- munitions
- TMDE calibration and repair
- logistics automation assistance (software support to units having combat service support STAMIS, SDS, SIDPERS, and TAMMIS)
- Field Assistance in Science and Technology
- Logistics Assistance Program (LAP)
- Army Oil Analysis Program (AOAP)

The LSG would perform its functions under the operational control (OPCON) of the senior Army logistics headquarters in the theater, and would have technical lines tying back to elements of AMC and DLA, among others.

The LSG would only stock selected high dollar - high technology - low density items as identified by the theater army materiel management center (TAMMC) and items that support the GS/limited depot maintenance program. The LSG supply division would be linked to CONUS wholesale inventory managers at national inventory control points (NICPs) via the Standard Depot System (SDS).

The LSG maintenance division would be structured to perform designated limited depot and GS maintenance if needed. If the functions are actually performed by contractor personnel, the LSG's Procurement and Contracting Support Division would provide oversight of contracting officers' representatives (COR), who would monitor contractor repair activities.

Within a theater there may be various AMC-funded contractors operating in support of the theater mission. These contractors' efforts must be orchestrated to ensure the support provided is based on the priority prescribed by the theater army (TA) or corps commander. Controlling contractor activities directly from the

commodity commands of AMC or DLA is communications-dependent and not time-sensitive (draft concept, Logistics Support Group, 16 Mar 92).

Contractor support, using a weapon system approach, is managed by the MRCs of AMC. In all likelihood the contracting officers (KO) will be located at the CONUS-based commodity commands; however, each KO will have an individual located in the theater to oversee contractor operations. The Procurement and Contracting Support Division would effect "command and control" over the various contractor operated activities in the theater through the CORs and provide administrative services to the CORs as well as coordinating workload based on theater priorities. Theater contractor support would include--

- forward repair activities (a specialized weapon system or commodity-oriented maintenance or repair activity)
- weapon system-oriented contractor field service representatives (CFSR) assigned to specific operational units
- supply and logistics specialists to assist in distributing critical repair parts
- operations and maintenance personnel for new equipment fielding of prototype systems

Some of the issues involving the LSG concept that are currently being resolved include--

- mobilization, deployment, and theater support procedures for DOD civilians and contractor personnel
- TDA management procedures for personnel and equipment authorizations

Among the study group's findings regarding the LSG concept are the following:

- At present there is a low level of IEW acknowledgment and involvement in the LSG concept.
- Current drafts of the LSG structure depict a COMSEC/IEW branch within the LSG's maintenance division.
 - The study group was told on at least one occasion that the only reason for combining COMSEC and IEW in one branch was that there was not sufficient space on the organization chart to show a separate IEW branch; except for some similar security requirements, the COMSEC and IEW commodities are distinct enough to warrant separate branches within the LSG structure.

- The IEW part of this branch (including the supervisory part) should be formed from assets who perform IEW sustainment functions in peacetime, not from assets that are unfamiliar with the special considerations of the IEW commodity.

Integrated Sustainment Maintenance Concept

The Integrated Sustainment Maintenance (ISM) concept, currently under development by the Strategic Logistics Agency, would affect sustainment maintenance activities throughout the Army, including IEW systems. "Sustainment maintenance" in this context is defined as all maintenance above DS level. An understanding of the concept is necessary to ensure that recommendations to streamline IEW sustainment will be in synchronization with this effort to develop responsive, seamless sustainment maintenance for the Army (sources are references 6 and 7).

At present management controls over sustainment maintenance resources are fragmented.

- Within AMC the Depot System Command (DESCOM) controls organic maintenance resources (i.e., depots).
- The commodity-oriented MRCs control contractor resources through the placement of national level support contracts.
- FORSCOM and other MACOMs manage Active Component GS maintenance unit resources.
- Reserve Component and installation DOL GS capabilities are controlled by the Army Reserve, the National Guard Bureau, FORSCOM, and other MACOMs.

A major lesson learned from ODS was that the Army did not possess rapidly deployable sustainment maintenance capabilities (reference 6). DESCOM and contractor resources were used to fill in for late deploying RC units, but it took time to make this happen. Much of the delay resulted from lack of unified control over the various elements in the Army's maintenance infrastructure. Extensive coordination was required among AMC, FORSCOM, other MACOMs, the Office of the Chief of the Army Reserve (OCAR), and the National Guard Bureau (NGB) to determine the best way to meet the sustainment maintenance needs of the deploying forces and to ensure that those resources were provided where needed.

The ISM concept would integrate sustainment maintenance under a single national manager, the ISM manager (ISMM) (see reference 7). The ISMM, who would reside within the AMC organization, would control all civilian and AC/RC military maintenance resources above DS level to include the following in peacetime as well as war:

- corps and EAC GS maintenance units
- the GS level functions of installation materiel maintenance offices
- organic depot maintenance operations
- contractors carrying out sustainment maintenance activities under national maintenance contracts

The resources controlled by this manager would be--

- trained on appropriate equipment
- cross-trained, integrated, and force-tailored using building block principles
- applied against specific scenarios
- deployed to bring effective sustainment maintenance to the field

Peacetime support to field forces would be in the form of--

- tailored on-site maintenance
- regional maintenance centers (e.g., DOL shops at specific installations, etc.)
- contractor maintenance support
- specialized depot maintenance programs
- MWO application teams, etc.

The ISM concept would allow contract maintenance support to transition from the current situation to an improved posture (see figure 3-1, source: SLA briefing on ISM).

Contract Maintenance Support	
CURRENT	FUTURE
<ul style="list-style-type: none"> ● Unique contracts ● Overlapping/redundant support ● Fragmented transition planning ● Resource intensive ● Ad hoc execution ● Not contingency responsive 	<ul style="list-style-type: none"> ● Integrated contracting* ● Weapon system/multi-user ● Strengthened technical/cost performance management ● Reduced administration ● Preplanned deployment ● Symbiotic relationship
<p>* through command/control of contractors for contingency operations (early-on planning)</p>	

Figure 3-1, Contract Maintenance Support

In national emergencies, the ISMM would provide timely, appropriate, tailored sustainment maintenance support in theater, backed up by the national level ISM infrastructure. The ISMM would be responsible for ensuring that an integrated pool of resources for conducting sustainment maintenance is entered on Time Phased Force Deployment Lists (TPFDL) in support of theater contingency plans. The deployed ISM resources would be under the OPCON of the senior Army logistics headquarters, but would be monitored and workloaded by the ISMM.

The ISMM would have a key role in ILS planning for new systems and would concur in the maintenance concept for these systems. National maintenance points (NMPs) would still place and manage national maintenance contracts and contractor sustaining maintenance support; however, the ISMM would provide CORs or COTRs to carry out appropriate management functions.

Although many specifics of the ISM concept remain to be developed, the concept offers the potential for solving many of the problems encountered in the integration of materiel sustainment.

Forward Repair Activity (FRA)

Although the study group was told that this emerging concept had recently been put on hold pending further development of the ISM concept, SLA provided information on a concept called the Forward Repair Activity (FRA) that would also affect IEW sustainment. While incorporating lessons learned from ODS, the FRA

concept envisions a structure that would serve in peacetime as well as wartime to provide forward based, highly responsive, rapidly deployable, flexible, skill heavy, equipment light, limited depot and backup intermediate level repair activities (see reference 5).

Characteristics of FRAs would be as follows:

- located near intermediate (DS and/or GS) level customers to provide acceptable turn around time on repairs
- positioned closer to using units, thus expediting repair and transportation to reduce costly pipeline requirements while improving readiness
- standardized structure to support selected critical components from high tech weapon systems during peace and war. Structure will be responsive to--
 - weapon system orientation
 - workloading from multiple sources
 - MACOM mission requirements
 - contingency operation requirements
 - integrating various sources of repair (i.e., organic, contractor, or mixed)
- regional, forward deployed, limited depot and backup intermediate level repair capabilities
- supports multiple weapon systems and equipment critical to customers' missions
- repairs select critical items which are expected to be high tech, high dollar electronic, electro-mechanical, or electro-optical line or shop replaceable units (LRU/SRU)
- stocks limited range of items that are visible to the NICPs' wholesale managers and can be moved rapidly via dependable, expedited transportation to another FRA, depot, factory, or customer within 24 hours
- consists of highly trained and experienced military, civil service, and contractor personnel

EAC Integrated Repair Activity ("X"RA)

A refinement of the CIMMC SRAs mentioned previously, "X"RAs are an outgrowth of this IEW Streamlining study. "X"RAs would provide GS (including repair and return of reparable modules) and backup unit (organizational and DS) support for all IEW systems on a corps or regional basis. "X"RAs would support all of the following:

- systems that have transitioned to AMC support
- systems that have not yet transitioned to AMC support
- MACOM-unique systems
- systems supported by ICS and CLS

Key differences between the ISM concept and the "X"RA concept are as follows:

- the ISM organization would be multi-commodity in nature; whereas, the "X"RAs would only service the IEW commodity
- the ISM organization is envisioned to fit within a new Industrial Operations Command within AMC; whereas, the "X"RAs would be controlled by CIMMC, AMC's wholesale management activity for IEW materiel (a logical alternative would be for CIMMC to include the ISMM for IEW materiel)

"X"RAs would be deployable to support contingency operations and would be expandable, consisting of a core capability supplemented by various modules or cells as required. The core would consist of Government personnel (military and/or civilian) and an omnibus contractor. Functions of each "X"RA's core element would include--

- site management (command and control)
- contract supervision
- production control
- quality assurance
- common tool and test equipment support
- proactive support for IEW materiel readiness within supported organizations
- rapid deployment capability with military IEW maintainers
- non-OEM contract maintenance support

- subcontract arrangements with OEMs for repair and return of unserviceable assets
- shop supply support or the possible operation of a supply support activity (SSA) for IEW items including--
 - capability for unit distribution of IEW secondary items and parts
 - reparable exchange activity (RXA) (Note: although the "X"RA may operate an RXA, the "X"RA would also routinely perform repair and return; i.e., due to the low density of many IEW modules, the specific, serially numbered items turned in to the "X"RA would be repaired and returned to the owning unit.)

There are at least three alternatives that deserve serious consideration regarding the supply functions to be assigned to the "X"RAs: operation of a supply support activity (SSA) (see paragraph 3-2, AR 710-2, 31 January 1992), operation of a mission supply support activity (MSSA) (see paragraph 4-23, AR 710-2, 31 January 1992), and operation of an extension of CIMMC's mission stock record account (MSRA) . The SSA option combines supply and maintenance support functions in the "X"RA; whereas, the MSSA and MSRA options would identify the "X"RAs as strictly maintenance support activities. Figure 3-2 contains summary data on the "X"RA supply options.

Considerations	SSA	MSSA	MSRA
Supply support mission authorized by TDA/MTOE	●		
Supply function authorized by MACOM		●	●
Authorized to support-- external customers	●		
internal maintenance shops only		●	●
Separate TDA for each "X"RA	●	●	
Extension of CIMMC TDA			●
Retail DODAAC	●	●	●
Wholesale requisitioning authority	●	●	
Requisition through CIMMC			●
Responsible officer	●	●	Note 1
Accountable officer	●	●	●
Authorized stockage of-- spares	●		
forward storage of wholesale/PM assets		●	●
mission support repair parts	●	●	●
Automation required	SARSS/DS4	SAMS	SAMS-TDA
Contingency stockage-- on hand	●		
pushed from wholesale level		●	●
Note 1: Dir, CIMMC			

Figure 3-2, "X"RA Supply Considerations

Attached as required to the "X"RA core would be modules containing such resources as--

- OEM assets to support specific systems for which OEM support is required and/or cost-effective
- civilian depot employees when required for deployment

- additional military units to augment "X"RA repair capabilities

There would be a contractual linkage between the omnibus contractor and the OEM contractors. Where appropriate, OEM technicians would be located within the "X"RA to provide system-specific technical support; however, the "X"RA would also be capable of overseeing satellite cells providing on-site support at locations such as--

- CEWI battalions and separate MI companies
- corps and EAC MI brigades
- regional training sites - intelligence (RTSI)

A key role of the omnibus contractor staff would be to conduct activities which reduce dependance on the OEM technical base by improving the skills and qualifications of military IEW system maintainers. Such responsibilities would include technology transfer and sustainment training.

The use of an omnibus contractor to support a series of regional "X"RAs would have a number of beneficial effects including--

- lower overall cost due to elimination of redundant support structures
- less customer confusion
- improved visibility of forward positioned stocks

In order for the "X"RA concept to fulfill its potential in streamlining IEW sustainment, a number of changes are required such as the following:

- normal sustainment support must be standardized by minimizing--
 - program/project manager (PM) field support mechanisms
 - MACOM-unique support mechanisms
 - separate nonstandard AMC support mechanisms
- all nonstandard sustainment structures must receive DA DCSLOG approval as exceptions to policy
- existing nonstandard mechanisms must transition to the approved system

Figure 3-3 contains a features comparison summary of the current CIMMC SRAs with the proposed "X"RA.

Features Comparison	SRA	"X"RA
Interim measure	•	
Permanent (doctrinal) sustainment alternative		•
Supports only designated systems	•	
Provides service-oriented support to all IEW systems		•
Contains core functions augmented by system-specific capabilities		•
No connectivity with unit-specific support contracts	•	
Integrated management for unit-specific support contracts		•
Contains only contractor personnel	•	
May contain contractor, military, and civilian personnel		•
No supply support function	•	
Stocks selected high dollar, high tech, critical items		•
Facilitates technology transfer		•
No OEM involvement	•	
Integrates OEM contract support		•
Software maintenance capability		•
Provides facilities and support to on-site contractors		•
Provides training opportunities for Government personnel		•

Figure 3-3, Comparison of SRA and "X"RA Capabilities

Figure 3-4 contains a comparison of the proposed capabilities of the FRA and the "X"RA. There are only a few differences, none of which are major; for example, although the normal function of the "X"RA is GS (piece part) maintenance, if there were a requirement for in-theater limited depot maintenance for IEW systems, the "X"RA could provide command and control over the assets providing the capability.

Potential Capabilities	FRA	"X"RA
Repairs high dollar, high tech, critical items	●	●
Stocks selected high dollar, high tech, critical items	●	●
Supports multiple commodities	●	
Supports single commodity		●
Normal function is limited depot level maintenance	●	
Normal function is GS level maintenance		●
Provides training opportunities for Government personnel	●	●

Figure 3-4, Comparison of FRA and "X"RA Capabilities

Properly configured "X"RAs could serve as the GS repair activities for IEW materiel in a theater within the overall context of Logistics Support Groups.

Section VII - Future Technology

Technological advances in electronics are significantly affecting IEW sustainment maintenance. New technology and future technology trends are leading to better, smarter, smaller, more reliable electronic components. These advances will cause a change in the way IEW systems are sustained.

Present IEW Systems

The currently fielded systems, such as TEAMMATE and TRAILBLAZER, are based on integrated circuit technology of the 1970s and early 1980s. These systems were developed for use on a European battlefield against targets of even older technology and have the following characteristics:

- Processing time is slow, units are large, and failures are typically catastrophic.
- The systems are custom designed, each sufficiently different to require special system maintenance training for repairers.
- Considerable modification is required to interoperate with other IEW systems.
- The hardware and software are difficult and expensive to update.
- Current built-in-tests (BIT) allow maintenance personnel to isolate faults to the LRU, or "black box," which is removed and replaced with a spare.

- Extensive TMDE and/or intensive maintenance manpower are required to isolate faults to the individual CCA within the LRU, or when multiple faults occur.
- Resource constraints limit the distribution of specialized TMDE to GS level.

Next Generation IEW Systems

Modern systems such as the IEW Common Sensor (IEWCS) family are benefitting greatly from advances in technology made since the introduction of the current systems.

- Equipment is now much more reliable with dramatically increased mean time between failures (MTBF).
- Because of their design which includes system redundancy, systems can continue to operate in a degraded manner even when faults occur.
- Extensive system level BIT, which can isolate faults directly to the CCA level, is engineered into the Advanced QUICKFIX and the Ground Based Common Sensors. This BIT allows even operators to replace mission-critical CCA.
- Modern IEW equipment uses high speed digital signal processors which can successfully target the most advanced electronic systems.
- The concepts of modularity of subsystems, commonality of equipment among all IEW systems, and open systems architecture provide for easily accomplished, inexpensive, and timely upgrading of equipment with the latest technology.

Trends

Through improvements in device design and fabrication techniques, electronic components are becoming smaller, lighter, more reliable, and more efficient (i.e., require less power) than the current systems. From the discrete transistor evolved the integrated circuit (IC), which incorporates from 2 to 65,000 transistors. Modern electronic systems are using very large scale integrated (VLSI) circuits composed of up to 20,000,000 transistors.

Reliability is increasing because of manufacturing improvements in design, materials, and processes. Semiconductor devices, which are the building blocks for electronic equipment, are nine to ten times more reliable today than they were ten years ago. This trend is expected to continue.

BIT in the next generation systems is greatly improved. The power-up BIT in the TACJAM-A subsystem of the IEWCS automatically checks 65% of the equipment

in only 60 seconds. The operator can request a full BIT which will check 95% of the equipment in only five minutes. Each black box has a stand-alone BIT which can diagnose faults to the CCA level. To warn the operator of possible failures, there is also a background BIT which constantly monitors temperature, voltages, etc. The BIT is 98% successful isolating a fault to a single black box, 95% to two CCAs, and 70% to one CCA. In contrast, according to survey data from USAISD, the current IEW systems' BIT can isolate a fault to a black box only 45% of the time.

Thermal problems are being solved. The TACJAM-A has achieved worst case low junction temperatures of 85°C, which is significantly below the maximum operating temperature of 110°C. The trend is for even lower temperatures.

Electronic components, while becoming much smaller and lighter, are becoming increasingly complex. From 1988 to 1991 the CCAs in the TACJAM-A evolved from single-sided printed circuit boards (PCB), to double-sided PCBs with 1200 interconnects, to 14-layer PCBs with 2000 interconnects, to 16-layer PCBs with 3000 interconnects. Components of the CCAs have changed from relatively simple 14-pin brazed ceramic chips to 224-pin chips. This complexity, together with recent innovations such as surface mount technology and conformal coating, does exact a price for the advantages provided. That price is the cost of the component (\$15,000 to \$30,000 per CCA) and the cost of sustainment. There is a significant increase in difficulty to test, repair, and rework the component. Field testing would require expensive ATE, TPSs, and intense manual procedures. Field repair would require expensive equipment to perform the "microsurgery" required. Once the failed component is identified through the BIT at the unit, it will be evacuated directly to the wholesale level for testing and repair.

The most cost-effective source for maintenance is dependent upon the density of systems and the stability of technology. Cost-benefit analysis indicates that government sustainment support is best for high quantity systems with stable technology, while contractor sustainment support is best for low quantity systems and those with frequent technology insertion. Components in the next generation IEW systems fall into the second category. Analysis will continue to ensure the best strategy is used.

Future Technology Trends - 2005 and Beyond

Technology continues to advance. By the year 2005 current dreams will be reality.

- Power requirements, size, and weight will be reduced by a factor of 500.
- Processing throughput will be 250 to 1000 times greater.
- Platforms will be more reliable with much smaller payloads.

- Electronic systems will tolerate faults, and the larger systems will be self-healing and reconfigurable with firmware.
- IEW systems will have redundant fail-safe power distribution.
- Catastrophic failure will only be caused by battle damage.
- Design and programming techniques will automatically generate test vectors for diagnosis and BIT.
- Ultra-large scale integrated circuits (ULSIC) will use three dimensional wafer scale integration and multi-chip modules.
- Better data with fewer failures will be accomplished by performing the electronic processing at the antenna with an optical downlink to the user.
- IEW systems will use standard modules which will be reconfigurable and programmable for individual missions.
- Electronic components will be built into existing equipment to create such items as smart helmets and smart vehicles.
- Optical busses will be used along with multi-function chips in modular assemblies to replace circuit cards and backplanes.
- Hardware and firmware will be standardized.
- Robust fuzzy logic and expert systems will dominate the automation of intelligence processes, and, after 2010, true artificial intelligence will be used.
- Multiple sensor, autonomous platforms will be used for remote collection, fusion, and reporting of intelligence to more users.

Future ILS and Sustainment - 2005 and Beyond

Future ILS and sustainment requirements will be greatly reduced through a variety of factors.

- Hardware design languages and concurrent engineering will determine ILS, configuration management, and sustainment strategies.
- Component make, model, serial number and revisions will be tracked and verified automatically.
- Systems will be upgraded through automatic distribution or remote programming.

- Reconfiguration of the system will be remotely verified.
- The LRU will be the multifunctional ULSIC.
- BIT will be inherent in most complex chip sets and will automatically isolate faults to the individual chip.
- Field repair will consist of replacement or reprogramming of multifunction chips.
- Many multifunction chips will become cheap and expendable because of volume production.

Chapter 4

CONCLUSIONS, ALTERNATIVES, AND RECOMMENDATIONS

This chapter contains a summary of the conclusions reached and recommendations made during the research and interviews performed in support of the IEW Streamlining Project. Additionally, the chapter presents the various alternatives discussed and analyzed by the Study group.

Section I - Study Conclusions

The conclusions presented are based on occurrences during ODS, comments from personnel interviewed, studies of on-going Army doctrinal changes, and historical insight into the problems associated with sustainment of Army IEW systems.

Operation DESERT SHIELD/DESERT STORM

The support challenges raised during ODS provide an excellent backdrop to the analysis of the problems in supporting IEW systems. The problems surfaced quickly as units that had always been provided stovepipe support attempted to find support when the stovepipes were not in place and discovered a need for standardized support structures. The combination of organic support and contractor support has led to a proliferation of support channels and concepts, all of which were slow to be implemented in SWA and difficult to locate when units moved.

The initial locations within SWA, with the IEW GS detachments collocated with SRA I, provided an effective combination of capabilities within one area. The IEW GS detachments from FORSCOM provided NDI repair capability, and the SRA contractors provided the developmental system expertise the GS detachments did not have. This setup provided overall support for the FORSCOM NDI systems and the developmental systems but did not provide support for systems outside this structure; i.e., TROJAN SPIRIT, ASPO systems, and the aviation systems.

The initial combination of contractors and military maintainers worked fairly well, but, after the GS detachments moved forward, the problems with such a compartmentalized maintenance structure quickly became apparent. The corps GS units provided LRU exchange for standard systems and support for FORSCOM NDI systems but no repair capability for standard systems. Even some unique support (e.g., DRAGONFIX) moved forward with the GS detachments when it was needed in other areas. After the movement of the GS detachments, the SRAs, which did not move forward, had little capability, and no spares, for support of the FORSCOM NDI systems.

If IEW systems are to be fully supported on the battlefield of the future, this problem with lack of integration must be resolved. The best solution is a combination of contractors and soldiers, similar to what occurred initially in SWA, without the compartmentalization of repair capabilities that occurred in ODS. Soldiers and contractors should be trained and available to repair any systems requiring support. This arrangement would provide several avenues of support for systems and provide flexibility in deployment and task organization.

Support planning for IEW systems has historically been the responsibility of the theater G2 (intelligence) with little or no input from the G4 (logistics) staff, and SWA was no exception. The G4 did not become involved in IEW sustainment and did not bring IEW sustainment into standard support channels. Many of the problems occurring during ODS were addressed in the IEW Sustainment Plan developed by the G2 with minimal input from the G4. A problem with the G2 plan was a lack of understanding of the logistics channels in place and where future support would be needed.

The problem of the intelligence staff planning sustainment has occurred for many years because IEW sustainment has been outside the standard Army system. Since the G4 does not coordinate or control IEW sustainment in peacetime, there is usually no one on the G4 staff that understands IEW sustainment problems; therefore, the sustainment of IEW equipment is rarely addressed in logistics planning. IEW maintenance planning and execution needs to be brought back into standard channels under the control of logistics personnel.

During ODS there was an identified need to realign the IEW support structure of the two corps to provide the best overall IEW support to the theater. This realignment required the corps to give up control of their IEW GS maintenance assets so the entire theater could be supported in a more efficient manner. Both corps refused to release their units and continued to move their IEW detachments forward when the corps GS units moved forward. Besides degrading the support for IEW systems, this action further fragmented the control structure for IEW support.

A problem exists in determining who is responsible for IEW sustainment and who controls the assets that are to provide sustainment for IEW systems. The corps control IEW GS maintenance assets, AMC controls SRAs through CECOM and CIMMC, and the PMs control the assets they fielded to support PM-sustained systems. Control of the sustainment resources needs to be resolved with responsibility for IEW sustainment assigned to one activity.

During ODS many contractors, support organizations, and maintenance units were deployed to support IEW equipment with no centralized control and accountability and, in many cases, with little administrative and life support for civilian contractors and DOD civilians. The SWA IEW Sustainment Plan identified a need to consolidate and streamline all this support under one activity. This activity would have allowed for an economy of effort in logistics support along with providing customer units a single point of contact for support.

This structure was never implemented as the individual support contractors and PMs continued to maintain their systems with their own stovepipe support structures. The PMs did not want to transfer sustainment of their systems to a new structure at a time when battlefield performance was critical. The continuation of the individual support stovepipes contributed to duplication of effort, lack of control, non-responsiveness, and confusion for the units.

Sustainment maintenance support should be established under the command and control of one organization. This organization would then have the responsibility and authority to plan for deployment to provide the optimum sustainment support for the deployed forces. This setup would also provide only one organization to deploy instead of the situation in which multiple organizations and support contractors all try separately to obtain transportation to a theater.

Impacting Factors on IEW Sustainment

Force structure changes currently occurring in the Army are forcing changes in the way systems are supported. Fewer soldiers mean fewer repair personnel, and the Army has generally tried to reduce the logistics tail rather than the fighting force, implying even fewer repair personnel in the future. Current Army planning indicates the deactivation of two IEW GS maintenance detachments over the next few years, down to a total of two platoons (one in FORSCOM and one in USAREUR). With this downsizing the Army must recognize the need to provide a flexible sustainment structure that will maintain readiness and provide support to replace the deactivated detachments.

The study group researched and reviewed a number of emerging logistics policies and concepts pertaining to both the Army and, specifically, IEW sustainment. These references included the US Army Ordnance Center and School (USAOC&S) draft vision document and the AMC Logistics Power Projection message, which include the evolving logistics concepts of Integrated Sustainment Maintenance (ISM)/Forward Repair Activity (FRA), Single Stock Fund (SSF), Total Asset Visibility (TAV), and Readiness Based Maintenance (RBM). The study group also analyzed with regard to IEW sustainment the Objective Supply Capability (OSC), an automation system being developed by CASCOM.

- Integrated Sustainment Maintenance
 - Under ISM, sustainment managers will be established at installation, regional, and national levels. Given this infrastructure, the AMC support cells providing dedicated unit level support would be responsive to the installation sustainment manager. The integrated regional EAC support cell would be responsive to the host installation sustainment manager for installation unit requirements and the regional sustainment manager for area based support requirements.

- On a narrower scale this concept could be directly applied to IEW sustainment to provide for single point responsibility. At the national level, the Executive Agent for IEW Logistics Sustainment would be directly responsive to the national level ISM manager for routine and contingency support requirements.

- **Forward Repair Activity**
 - FRA would serve as a depot level repair subset of the ISM, standardizing command and control of depot repair capability and moving it forward to sustain key, high tech, high dollar, low density items. Movement of higher level repair forward provides quicker repair and higher readiness rates. This structure was proven during ODS to reduce transportation delays and improve weapon system availability by moving diagnostics and repair closer to the point of failure.

 - Peacetime cost reductions are also provided through reduced "pipeline buyout" of expensive components.

 - IEW sustainment fits the definition for systems that benefit from forward repair. The success of the Rainbow SRAs in maintaining IEW equipment in SWA is a prime example of how well a forward repair type of operation can perform in a contingency.

- **Single Stock Fund**
 - SSF will consolidate the wholesale and retail stock funds under AMC management, thus streamlining supply and financial processes and providing increased vertical and horizontal asset visibility. The result will be increased responsiveness of supply support at both the installation and depot levels.

 - IEW sustainment activities need more precise information on the cost of equipment sustainment for input to the budget process. Currently this information is not available for all systems, but it must be captured to provide the required information for budget submissions. Implementation of SSF will assist in obtaining the required budget input data.

- **Total Asset Visibility**
 - The TAV program is designed to provide visibility of all Army classes of supply. The Army has been tracking class VII supplies for many years through the Continuing Balance System-Expanded (CBS-X) system and plans to implement a similar system for other classes of supply, including class IX repair parts.

- TAV will provide information on the numbers and locations of parts in stock at various levels and is expected to generate savings for the Army. TAV will permit the Army to buy fewer spares and repair parts by improving the capability to control and track spares already in the system. TAV will provide the IEW sustainment community the capability to track low density, high dollar spares at the division ASL level, thereby using available spares more efficiently and avoiding the purchase of additional spares for the supply pipeline.

- **Readiness Based Maintenance (RBM)**
 - RBM is a decision support tool which uses a mathematical model to process operational and logistics data in order to produce lists of prioritized repair requirements

 - RBM will help to maximize weapon system availability by recommending the proper distribution of repair parts and the proper sequencing of repair jobs

- **Objective Supply Capability**
 - OSC is an automation system which is expected to be fielded to all Army SSAs by the end of FY 94. It is designed to augment the retail supply system by increasing asset visibility and providing near real time status information to ULLS and SAMS-1 users.

 - OSC will reduce the Order Ship Time (OST) of requisitions processed through the wholesale system, thus decreasing pipeline costs, stockage levels, and handling costs. OSC, in effect, projects the wholesale supply system further forward on the battlefield.

 - OSC provides the opportunity for increased visibility of available IEW spares throughout the Army. With units properly maintaining their DS spares on the Division ASL with a forward storage location at the CEWI battalion, the visibility of available spares increases dramatically and can assist in improving the readiness of IEW systems.

- **USAOC&S Vision Paper**
 - The USAOC&S draft vision document, "Maintenance 2020," introduces a simplified two-level maintenance system consisting of "field" and "sustainment" levels. The field level encompasses the current levels of Operator/Crew, Organizational, and DS. The sustainment level covers GS and Depot. The USAOC&S predicts that this system will more appropriately focus the combined efforts of the entire logistics system on the philosophy of fixing as far forward on the battlefield as possible.

- Many IEW systems use a maintenance support structure similar to the "Maintenance 2020" concept. The unit performs both Organizational, and DS maintenance on their equipment using the 33T personnel from the C&E maintenance section of the battalion. Maintenance above this level is performed by contractors or OEM.
 - Support of high-tech IEW systems lends itself to the two-tier maintenance system. The current four-tier system, with reliance on soldier maintenance from unit to GS level, is not favorable to support of the emerging generation of IEW systems. Under the two-tier concept, IEW equipment would be evacuated from the field level of repair directly to the sustainment level, which would be an EAC repair activity under the command and control of AMC. Mobile support teams (MSTs) from the EAC repair activity could also be sent forward to perform sustainment level repairs at the unit location. This setup would improve the current system, wherein corps have their own GS IEW maintenance activities, through centralized IEW maintenance management at the EAC level.
 - The proposed setup would also provide an advantageous environment for the integration of skilled civilian maintainers (DOD and contract) with soldier technicians. Such an activity would differ from an SRA as prescribed in AR 750-1 in that it would be a permanent activity to provide blanket support for IEW systems. It would be neither subject to MACOM requirements nor restricted to the support of specific stock numbered systems.
- **AMC Logistics Power Projection**
- The AMC Logistics Power Projection message outlines the need for a more responsive logistics base to sustain a smaller, more lethal force in combat and peacetime. To accomplish this objective, AMC proposes use of three of the above concepts, ISM, FRA, and SSF, melded together to form a total concept of logistics. In addition AMC plans to incorporate into sustainment doctrine the Logistics Support Group (LSG), which will draw from the ISM and FRA structures during wartime.
 - To ensure a responsive, integrated support structure in the future, the IEW materiel sustainment program should be aligned with these forward reaching concepts.

The FORSCOM experience with fielding NDI has provided a model of what the future may hold with regard to IEW sustainment. The FORSCOM NDI experience has reflected an evolutionary process rather than a turn-key operation. FORSCOM's experience has indicated that--

- soldier support could be very effective but is heavily dependent on contractor-provided training
- support documentation can be a mix of military and commercial data
- additional documentation can be provided over time
- hot mock-ups, where available, are very useful
- supply support can be (but does not have to be) nonstandard
- as with standard systems, sustainment skills are subject to personnel turnover

The accelerating rate of technological change indicates a need for the future IEW sustainment structure to be adaptable and capable of supporting new technologies. Technologies that will challenge the future sustainment base include:

- Multi-layer circuit boards requiring specialized soldering capabilities and equipment. Circuit boards currently fielded range from one to five layers; the boards for future systems will range up to 16 or more layers.
- Increasing speed of data and memory circuits. Computer speeds are increasing from 8 Megahertz (MHz) to the expected future standard of 50 MHz, requiring faster TMDE and more precise troubleshooting capabilities.
- Compactness of circuitry. Integrated circuits (ICs) have been reduced in size while increasing in complexity and capability. Older circuit cards with 100 fourteen-pin ICs can now be replaced with one 50-pin IC.
- Improved test capability. Circuit cards in future systems will incorporate extensive BIT/BITE, but will require extensive maintenance capabilities in troubleshooting and repairing the card.

The rapid changes in technology will require that IEW sustainment activities rely on resources that have a high probability of being able to provide the necessary skills and expertise for equipment sustainment. Often the best source of such expertise for new technologies is found within the OEM that built the system or from a contractor that has worked on new technology equipment. The rapid development of new electronics technology may not allow development of a cost-effective organic capability to sustain a particular system for a relatively short life cycle, again dictating the need for contractors in support of a system.

Future IEW acquisitions will include many more systems that are designed for a reduced life cycle, prototypes fielded for extended user testing, and NDI systems. All of these acquisition directions rely on less logistics support with the inherent decrease in documentation, parts provisioning, and training. This decrease in logistics

products from the acquisition community will dictate the continuing need for civilian contractors in the sustainment process.

Section II - Alternatives and Recommendations

The current sustainment practices for IEW equipment provide an environment with multiple stovepipe support systems, no central command and control, and no agency with overall responsibility for sustainment. If allowed to continue, these practices will lead to a repeat of the ODS experiences in any future contingency. The need for change is evident; however, the direction of the change must focus on--

- maintaining a strong military repair element with a fix-forward capability at the GS maintenance level with balanced skills and abilities across NDI and standard systems, thus providing the capability for an initial, rapidly deployable, contingency-dependent, sustainment support element for any future conflict
- accommodating, while controlling, the OEM skills needed for support of specific systems, which will allow the Army to take advantage of new technology and capabilities
- developing a flexible support structure that can provide responsive support to the fielding of advanced technology prototypes on the battlefield
- creating a sustainment structure that can provide a highly skilled technician base with an average of eight to 12 years experience
- facilitating the transfer of knowledge from OEMs to the generic contractor base and then to the soldier support base at the GS level
- reducing the number of contracts, required facilities, and the associated contract and government overhead required to support IEW maintenance
- complying with HQDA and AMC logistics objectives which would include integration into the LSG upon deployment

The study team analyzed and reviewed a number of different proposals for the sustainment of IEW equipment before deciding to recommend the objective concept.

Recommended Objective Concept

The recommended objective concept would establish CIMMC as the Army Executive Agent for IEW Logistics Sustainment. This designation would result in clear, single point responsibility within the Army for IEW logistics sustainment.

All sustainment contracts and DA civilians working in IEW sustainment would be centralized under the control of AMC, including resources supporting developmental, NDI, and CLS systems independent of the level of acquisition management. In addition, centralized support would extend to systems undergoing field prototype analysis. This arrangement would bring about centralized control of all nonmilitary sustainment resources at each echelon including CLS performed at DS and unit locations. This setup would provide integrated control over all IEW sustainment assets during a conflict.

The objective concept would provide regional support with a fix forward capability for IEW systems throughout the corps area. The IEW GS maintenance elements, currently assigned to EAC, would be fully integrated with the existing contractor support base collocated with each GS element under the command and control of AMC. This structure would be expanded to incorporate the aforementioned consolidation of civilian support elements to provide regional support with a corps focus. The regional facility would provide integrated soldier, civilian, and contractor support.

Units with requirements beyond the capability of the regional facilities would receive dedicated support. Dedicated civilian-based support would be provided, as necessary, to IEW aviation units, MI brigades, unique equipment within the corps/theater staff, and unit level equipment under CLS. Support would remain under AMC command and control following the standard support system as near as possible including the use of standard automation, supply support documentation, and stock funding requirements.

Both regional and dedicated support would rely on an expanded distribution system, fine-tuned for support to low density systems. Heavy reliance on state-of-the-art transportation tracking and control technologies would be incorporated to provide heightened visibility for low density, high dollar value spares.

To take advantage of the emerging logistics processes and provide for increased asset visibility and redistribution, all ASL spares would be accountable by the supporting SSA. Due to low density and sporadic demand for these high value assets, IEW spares would require designation for mandatory stockage. Spares with high failure rates would be positioned at a forward storage location at the MI battalion. SSA accountability would provide asset visibility, capture demand data and budget information, and ensure that all transactions occur within the stock fund process.

Under contingency operations a task-organized portion of national and regional cells would provide forward deployed sustainment maintenance. The initial deployment would consist of military personnel with eventual reinforcement by civilians and contractors as needed. This(These) cell(s) can become, or can provide support to, the COMSEC/IEW repair branch of the LSG. This concept follows closely with evolving doctrine in both SLA and CASCOM under the Integrated Sustainment Maintenance concept.

The recommended objective concept would provide improved readiness through mission enhancements and resource savings such as the following:

- **Mission enhancements**
 - reduced maintenance turnaround time
 - fix forward capability
 - one stop service (single point of contact)
 - improved visibility of spares
 - integrated deployment of assets
 - soldier/civilian teaming

- **Resource savings**
 - facilities
 - TMDE
 - contract overhead
 - contractor personnel
 - intraservice support agreements

Alternative Concepts

Another alternative is to maintain the status quo; however, this alternative would do nothing to streamline IEW sustainment and, thus, would not meet the objectives of the study.

The study group also reviewed the strengths and weaknesses of a concept which would involve the MACOMs' managing their own organic IEW sustainment activities in peacetime. AMC would supplement these activities with a forward repair cell integrating all support contractors for developmental and NDI systems. In a transition to war, the IEW sustainment activity and FRA would transition to AMC control for theater support. This concept would provide MACOMs control of their own IEW maintenance assets, require no doctrinal changes, and be a step toward seamless logistics. This concept would centralize all contractors within one activity, thus integrating military and civilian resources, maintaining repair and return through the contractors, and providing MACOMs with control of their own peacetime repair resources. This alternative would give MACOM commanders great latitude and

flexibility in creating IEW sustainment structures which fit their own specific needs. The disadvantages of this concept include--

- lack of an integrated Army-wide IEW sustainment system
- difficulty in transferring control to AMC during a conflict
- separate command structures for the FRA and IEW GS detachments
- high probability of inconsistencies in operations between MACOMs

This alternative also would not allow training in peacetime as the Army would fight in war.

Additional Recommendations

Regardless of the eventual support structure to be approved, the following additional recommendations are made:

- Develop revised IEW sustainment doctrine for incorporation into field manuals.
- Implement force structure changes to support doctrinal changes.
- Develop doctrinal EAC integrated repair activities ("X"RA) that can integrate military, civilian, and contract sustainment resources in peacetime and wartime within the framework of on-going initiatives to improve sustainment activities Army-wide.
- Ensure that IEW sustainment is adequately addressed within the Integrated Sustainment Maintenance concept and the Logistics Support Group concept.
- Standardize sustainment support by minimizing PM field support mechanisms, MACOM-unique support mechanisms, and separate nonstandard AMC support mechanisms.
- Closely manage the acquisition and fielding of materiel to ensure proper integration of contract and DOD civilian resources into the sustainment support structure.
- Establish mission supply support activities (MSSA) to manage EAC integrated repair activity stocks of spares.
- Develop an IEW support structure which maintains appropriate visibility of IEW spares. Ensure that high cost spares are accounted for on SSA or MSSA records to provide asset visibility, demand data, and budget information.

- Take advantage of state-of-the-art transportation tracking and control technologies to improve the distribution and control of IEW spares and reparable.
- Ensure that IEW sustainment is supported by clear funding responsibilities and budget requirements.
- Establish repair prices to support repair and return programs for depot level reparable.
- Develop detailed action plan(s) and implementation plan(s) to ensure approved study group recommendations are implemented.
- Develop and publish the HQDA approval process for exceptions to the standard IEW support structure.
- Improve the BOIP development process.

Required Implementation Actions

The IEW Streamlining Study team will complete the tasks listed below to implement the study recommendations. The team will also identify inherent and impacting actions which are required to implement the approved concept, including the development, implementation, and evaluation of training required to maintain the IEW sustainment system. Study group members will identify inherent actions for their MACOMs for concurrent implementation and action.

- Develop a concept implementation plan to include demonstration procedures with evaluation criteria. The demonstration will be conducted at multiple locations and will include an independent evaluator. (Principal Study Group/SLA)
- Create a financial process work group to--
 - capture all concept-related resource requirements in a special Management Decision Package (MDEP)
 - track execution in order to analyze costs
 - manage the realignment of budgeted resources
 - update IEW systems data in the Training Resource Model (TRM)
 - recommend a method of implementing Defense Business Operations Fund (DBOF) policy for low-density, single-user, and CLS-supported IEW systems (Principal Study Group)

- Conduct analysis of all IEW systems for inclusion in, or exemption from, the Army stock fund process as nonstandard logistics systems (NSLS) (SLA/Principal Study Group)
- Develop cost-based repair guidelines and an implementation procedure for cost-based repair and return (Principal Study Group)
- Identify all contract and civilian IEW sustainment support mechanisms and establish a time-phased plan for transition within AMC (AMC)
- Document the IEW regional repair activity to delineate core civilian and military personnel and equipment requirements (Principal Study Group)
- Recommend to the HQDA DCSLOG a tailored acquisition logistics development and fielding model to support the new concept (Principal Study Group)

Section III - Study Summary

The integration of IEW sustainment under AMC will provide the Army with clear lines of authority and responsibility for responsive support in peacetime and wartime. The recommended concept retains an environment for the intensive management of low density, high cost, highly complex assets while integrating IEW sustainment into the emerging mainstream Army logistics support methodology. The study anticipates resource savings at the Army level in addition to an improved readiness posture. (See final concept plan and briefing graphics at Appendixes F and G, respectively.)

Appendix A

References

Appendix A

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Appendix B
IEW Systems List

Appendix B

IEW Systems List

The following systems are included in the IEW Streamlining study:

ADVANCED QUICKFIX	AN/ALQ-151A
CEFIRM LEADER*	AN/ULQ-11
CTT	AN/TSC-125
DRAGONFIX*	AN/TSQ-164
EPDS	AN/TSQ-134(V)
ETUT	OW-108/TSQ-134(V)
GBCS-Heavy	
GBCS-Light	
GOLDWING*	AN/GRQ-27A(V)1 & 2
GRCS	AN/USD-9B
GUARDRAIL V	AN/USD-9
HACJAM*	AN/ULQ-19(V)3
HAWKEYE	AN/TYQ-52
IES	
IGRV	AN/USD-9A
IMETS	
IPDS	
JSTARS (GSM)	AN/TSQ-132(V)2
LMRDFS	AN/PRD-12
MANPACK DF (MINIFIX)*	AN/PRD-11
MICROFIX (FAISS)*	AN/UYK-71A
OUTS Receiver System	AN/TRR-27A
OV1D/SLAR	AN/APS-94F
QUICKFIX IIB	AN/ALQ-151(V)2
QUICKLOOK II	AN/ALQ-133
RACJAM*	AN/ULQ-19(V)2
SANDCRAB	AN/TLQ-17A(V)3 w/OE-317/TSC-99
SOCRATES	AN/GYQ-21(V)
SSMS	
TACFIX*	AN/TRQ-37
TCAC	AN/TSQ-130(V)
TEAMMATE	AN/TRQ-32(V)1
THMT	OW-109/TSQ-134(V)
TRACKWOLF	AN/TSQ-152(V)
TRAFFICJAM	AN/TLQ-17A(V)3
TRAILBLAZER	AN/TSQ-138
TROJAN SPIRIT	AN/FSQ-144(V)
UAV	

*FORSCOM NDI system

Appendix C

Army Maintenance System Description

Appendix C

Army Maintenance System Description

The standard Army maintenance system for ground equipment consists of four levels as follows (see AR 750-1, paragraph 3-8):

- Unit level, which normally includes (AR 750-1, paragraph 3-9)--
 - performance of PMCS (Preventive Maintenance Checks and Services)
 - inspections by sight and touch of external and other easily accessible components per the TM (technical manual) 10- and 20-series
 - lubrication, cleaning, preserving (to include spot painting), tightening, replacement, and minor adjustments authorized by the MAC (Maintenance Allocation Chart)
 - diagnosis and fault isolation as authorized by the MAC
 - replacement of unserviceable parts, modules, and assemblies as authorized by the MAC
 - requisition, receipt, storage, and issue of repair parts
 - verification of faults and level of repair of unserviceable materiel prior to evacuation
 - evacuation of unserviceable reparable beyond the MAC authorization to correct or repair to the appropriate maintenance support activity for repair
 - recovery or transportation of equipment to and from the supporting maintenance activity
 - accomplishment of all tasks required by the AOAP (Army Oil Analysis Program)
 - reporting materiel readiness per AR 700-138
- Direct Support (DS) level, which includes (AR 750-1, paragraph 3-10)--
 - inspection of all items to--
 - verify serviceability of the item

- determine if unserviceable items were rendered unserviceable due to other than fair wear and tear (FWT)
- determine economic reparability
- repair of unserviceable economically reparable end items per MACs for return to the user
- repair of all economically reparable components when MAC F-coded level repair will return the items to a serviceable condition; items will be repaired and returned to the requesting maintenance or supply activity
- provision of proactive materiel readiness and technical assistance to unit maintenance elements including--
 - visits to supported units on a regular basis
 - advice to supported units on proper methods for performing maintenance and related logistics support
 - coordination with supported units to perform technical inspections when requested
 - on-site assistance to supported units
- diagnosis and isolation of materiel or module malfunctions, adjustment, and alignment of modules that can be readily completed with assigned tools and TMDE
- performance of light body repair to include straightening, welding, sanding, and painting of skirts, fenders, body, and hull sections when required to stop corrosion or retain structural integrity
- evacuation of economically reparable end items to designated maintenance facilities when repair is beyond authorized capability or capacity; evacuation and return after repair will be through maintenance channels
- evacuation of maintenance repair code D, H, and L economically reparable components to the supporting supply activity if repairs are beyond MAC F-coded repairs
- evacuation of economically reparable components that can be returned to a serviceable condition using MAC F level repair to designated maintenance facilities when repair is beyond capability or capacity; evacuation and return after repair will be through maintenance channels

- providing backup DS maintenance support to other DS units and requesting backup support from GS and other DS units as required
- fabrication as identified by the appropriate technical manual
- General Support (GS) level, which includes (AR 750-1, paragraph 3-11)--
 - diagnosis, isolation, and repair of faults within modules and components in accordance with MACs
 - repair of selected LRUs and PCBs (printed circuit boards) in accordance with the MACs
 - performance of heavy body, hull, turret, and frame repair in accordance with the MACs
 - area maintenance support, to include technical assistance and onsite maintenance as required or requested
 - collection and classification of class VII materiel (less aircraft, ammunition, missiles, and medical materiel) for proper disposition
 - operation of cannibalization points, when authorized by MACCM commanders (AR 710-2)
 - evacuation of unserviceable end items and components through the appropriate supply support activity
 - fabrication or manufacture of repair parts, assemblies, components, jigs, and fixtures when approved by the MACOM
 - request for backup support as required
- Depot level, which includes (AR 750-1, paragraph 3-14)--
 - repair or overhaul of PCBs, assemblies, subassemblies, and major end items that are beyond the capability of the GS maintenance category
 - technical support and backup to DS and GS maintenance units

Aircraft maintenance consists of three levels as follows (AR 750-1, paragraph 5-18):

- Aviation Unit Maintenance (AVUM) level, which includes high frequency "on-aircraft" maintenance tasks required to retain or return aircraft to a fully mission capable (FMC) condition (AR 750-1, paragraph 5-19)

- Aviation Intermediate Maintenance (AVIM) level, which includes (AR 750-1, paragraph 5-20)--
 - mobile, responsive, one-stop maintenance support
 - all maintenance functions as designated by the MAC such as replacement and repair of modules and components and repair of end items that can be efficiently accomplished with available skills, tools, and materiel
 - repair of materiel for return to users emphasizing support of operational readiness requirements
 - establishment of a program to support AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level
 - inspection, troubleshooting, test, diagnosis, repair, adjustment, calibration, and alignment of aircraft system modules and components
 - determining condition of specified modules and components removed prior to the expiration of the time between overhaul or finite life
 - performing aircraft weight and balance inspections and other special inspections that exceed AVUM capability
 - quick response maintenance support, technical assistance through the use of mobile maintenance support teams, and aircraft recovery and evacuation
 - maintenance of authorized operational readiness float (ORF) aircraft
 - collection and classification services for serviceable and unserviceable materiel
 - operation of a cannibalization point
- Aviation Depot Maintenance, which includes (AR 750-1, paragraph 5-21)--
 - aircraft overhaul
 - crash and battle damage repair
 - modifications

Figure C-1 illustrates the current maintenance structure within the Army (reference SLA concept briefing for ISM); it depicts the distribution of tasks between various maintenance levels.

Current Maintenance Structure				
<ul style="list-style-type: none"> ● Multiple levels ● Varies by commodity / within commodity ● Difficult to manage in contingencies 				
4 LEVEL	(50 / 40) Depot/SRA	(40) GS	(30) DS	(20 / 10) Unit
3 LEVEL	(50 / 40) Depot/SRA	(40 / 30) AVIM		(30 / 20 / 10) AVUM
2 LEVEL	(50 / 30) Depot/SRA	thru		(20 / 10) Unit
TMDE	Depot	50 - 10		All

Figure C-1, Current Maintenance Structure

Several key policies regarding the Army maintenance system must be considered when dealing with IEW sustainment, such as the following:

- Repair on site, whenever possible, using the lowest level maintenance activity that has capability and authority to perform the work. Repair forward will minimize repair times by minimizing evacuation of materiel (paragraph 3-1h, AR 750-1).
- Contractors and contracted maintenance will not normally be allowed for unit or DS levels of maintenance. The intent of Army policy is that equipment issued to troops in TOE units be maintained by soldiers at unit and DS levels (paragraph 3-1i, AR 750-1).
- Maintenance will be performed by military personnel in areas forward of the corps rear boundary. Contractor maintenance personnel will not be permanently stationed forward of the corps rear boundary. Contractor maintenance personnel may travel forward of the corps rear boundary on a case-by-case basis as individual equipment failures occur to provide temporary on-site maintenance support. Behind the corps rear boundary, in addition to military personnel, civilian maintenance personnel (contract, TDA, local nationals, etc.) may be acceptable as a prudent risk on the probability of maintenance services being continued in wartime (paragraph 3-1i, AR 750-1).

Appendix D
Army Supply System Description

Appendix D

Army Supply System Description

The standard Army supply system currently consists of two levels, wholesale and retail. The glossary in the Unit Supply Update number 13, 31 January 1992, describes the levels of supply as follows:

Wholesale level - Level of supply support including national inventory control points, depots, terminals, arsenals, central wholesale data banks, plants, and factories associated with commodity command activities, and special Army activities retained under direct control of HQDA. Wholesale functions are mostly performed in CONUS. A wholesale system procures supplies for the Army from commercial sources or from Government plants. Wholesale supply support is accomplished by distributing supplies to retail level for stockage or for issue to users.

Retail level - Level of supply below the wholesale level. Retail level stockage generally is oriented toward attaining maximum operational readiness of supported units, and therefore it is based on demand or item essentiality. Installation supply and maintenance activities, DS organizations, and GSUs usually are engaged in retail level supply support.

Using the above descriptions, the standard or doctrinal supply support for Class IX (repair parts including reparable items) for MI units is conducted as follows:

- MI units maintain a stockage of repair parts to support the level of maintenance they are authorized to perform on organic equipment
 - MI units are authorized to maintain prescribed loads (reference appropriate TOE)
 - Prescribed loads are quantities of maintenance significant Class II and IV, and of Class VIII and IX organizational maintenance repair parts kept to support a unit's daily peacetime maintenance program. These repair parts may be moved into combat if transportation is available after essential lift requirements have been met (paragraph 2-19d, AR 710-2).
 - A PLL consists of the following types of unit maintenance repair parts (paragraph 2-21a, AR 710-2):
 - demand supported parts
 - approved nondemand supported parts

- initial stockage of parts for newly introduced end items
- The size of the PLL will not exceed 300 lines unless properly approved (paragraph 2-21d, AR 710-2).
- Since MI units are authorized to perform DS level maintenance functions on organic IEW equipment, they may include on their PLL items that are designated by technical manuals for the DS level; these items will not count against the normal 300-line limit on PLLs (paragraph 2-21k, AR 710-2).
- Since they are authorized a PLL, MI units are not authorized a shop stock or bench stock under current policies as spelled out in paragraph 3-15, AR 710-2.
- All supply requests will be submitted to the appropriate SSA (supply support activity) (paragraph 2-6l, AR 710-2).
 - Repairable items, a category which includes many low density, high cost, IEW repair parts, are also requested through the supporting SSA (paragraph 3-18, AR 710-2). Because of the low density, high dollar nature of many IEW modules, most SSAs provide only pass-through requisition and turn-in service, rather than attempting to umbrella the units' PLLs (reference 3).
 - Divisional and nondivisional SSAs provide repair parts support on a customer support basis (paragraph 3-2b, AR 710-2).
 - The Army distribution system maintains its wholesale stockage in CONUS and uses a modern distribution and transportation system to resupply the DS and GS SSAs directly from the CONUS wholesale base. Distribution of Class IX is accomplished by the direct support system (DSS). Although some stockage is retained in theater (war reserve, theater repaired assemblies, operational project stocks, etc.), most support requirements to the DS and GS SSAs are met by direct delivery from the CONUS Area Oriented Depot (AOD). DS and GS SSAs in CONUS are supported directly from the wholesale level. Backup stock is not authorized at CONUS installations to support DS and GS SSAs (paragraph 3-2e, AR 710-2).
 - No retail level authorized stockage list (ASL) backs up another ASL; back-up stockage is retained at the wholesale level (paragraph 3-2f, AR 710-2).
- The next level of supply support for MI units can vary depending on the type of activity designated to provide support. Such activities can be one of the following:

- installation supply support activity operated by the Installation Supply Division at CONUS installations (chapter 4, AR 710-2)
 - GS SSA such as managed by a corps materiel management center (CMMC) or theater army area command (TAACOM) materiel management center (TAAMMC) (chapter 5, AR 710-2)
 - Within overseas theaters, a theater Army materiel management center (TAMMC) is the theater source of supply for Class IX spares and repair parts (selected critical items) (paragraph 6-2, AR 710-2). TAMMC manages reparables for the theater (paragraph 6-8d(1), AR 710-2) and maintains theater-wide asset visibility for Class IX theater level reparables (paragraph 6-3d, AR 710-2).
- At the wholesale level, MI units receive supply support from activities such as--
- national inventory control points (NICP) associated with the commodity commands of AMC (e.g., CIMMC's B46, etc.)
 - Defense Logistics Agency (DLA)
 - General Services Administration (GSA)

Appendix E
System Acquisition Documentation

Appendix E

System Acquisition Documentation

A primary goal of the system acquisition process is to take full advantage of advanced technology; however, to ensure that new systems will be supportable, materiel developers must adhere to the requirements of Integrated Logistics Support (ILS). The objective of ILS is to obtain reliable, maintainable, transportable, and supportable materiel at the least cost of ownership by integrating logistic support considerations into the system and detail design effort (reference 3). The acquisition process calls for the support structure elements to be acquired concurrently with the system so that the system will be both supportable and supported when fielded (DOD 5000.2, Part 7, Section A, Integrated Logistics Support).

The approach, decisions, and plans associated with logistics planning efforts are documented in an Integrated Logistics Support Plan (ILSP) during system development and acquisition. During formulation of the Acquisition Strategy, determinations are made on whether Government, contractor, or a mix of Government and contractor logistic support is the most cost and operationally effective approach to supporting the system. From the outset, planning and consideration are given to interim contractor support (ICS), lifetime contractor logistic support (CLS), and full organic logistic support (reference AR 700-127 and AR 70-1). PMs are urged to structure their programs in such a way that interim contractor support will not be required (reference DOD 5000.2, Part 7, Section A). Transition to organic support will be planned to take effect as soon as design stability has been attained and support resources for the matured system have been achieved and demonstrated.

Army regulations and policies pertaining to the release of materiel to the users are designed to ensure the quality and effectiveness of Army equipment. The intent of the policies is to ensure that--

- the equipment is safe
- the equipment operates as designed
- the equipment is logistically supportable
- manpower and personnel considerations have been integrated (MANPRINT)

The success of a materiel fielding case is largely determined by the care and quality of coordination and planning exercised during development and acquisition by the materiel developer, combat developer, materiel readiness command, trainer, and user-MACOM. Prior to release to the Army user, the system/equipment must meet the criteria established in AR 700-142 (Materiel Release, Fielding, and Transfer) and DA Pam 700-142 (Instructions for Materiel Release, Fielding, and Transfer). Regardless of whether the system or item of equipment is acquired using the full

developmental process, an abbreviated or streamlined process, or is acquired as a totally nondevelopmental item (NDI), the fielding criteria must be met.

Army policy is that full release will occur only when all of the following are available to the user, or have been completed, prior to, or concurrent with, fielding (DA Pam 700-42, para 2-3):

- mission essential items
- support equipment
- test, measurement, and diagnostic equipment (TMDE)
- MANPRINT accomplished
- training support elements
- qualified personnel are available to operate the system and support equipment
- qualified personnel are available to maintain the system and support equipment
- approved new equipment training plan (NETP)

Among the essential documentation that must be created to ensure the supportability of materiel systems are the following:

- **QQPRI** (Qualitative and Quantitative Personnel Requirements Information) is a compilation of specified organizational, doctrinal, training, and personnel information developed by a materiel developer in coordination with the combat developer or trainer for new or improved materiel systems (Glossary, AR 570-2). QQPRI provides information concerning the numbers and qualifications of personnel involved in the use, maintenance, and transport of equipment or systems. Where appropriate, QQPRI also describes personnel duties, MOSs and skill levels, specialty codes, and organization (Glossary, TRADOC Reg 351-9).
- **BOIP** (Basis of Issue Plan) establishes the overall Army requirement for a materiel system (paragraph 4-5, AR 71-9), such as--
 - types of organizations to receive the equipment
 - quantities of equipment in each organization
 - associated support items of equipment
 - materiel to be replaced

- personnel requirements: quantity and quality
- **COEA (Cost and Operational Effectiveness Analysis)** is prepared to support decision milestones in identifying the preferred alternative for meeting the required operational capability (paragraph 4-2, AR 71-9). The analysis is a comparative evaluation of competing alternatives, identifying the relative effectiveness and associated costs of each alternative. The following considerations are included among the many factors analyzed by the COEA:
 - logistics
 - manpower and personnel
 - training
 - resource costs of each alternative
 - personnel requirements: quantity and quality

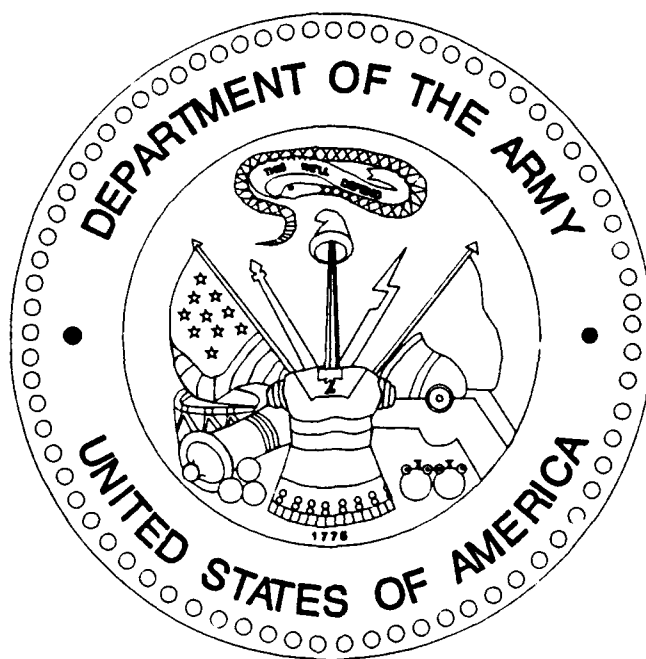
A key point is that the use of NDI does not automatically exempt a system acquisition from the overall life-cycle requirements. On the contrary, paragraph 1-11c(2) of AR 71-2 requires that expedited BOIP and QQPRI be submitted for NDI. When required documentation is not submitted, some support requirements may not be resourced or established.

Appendix F

IEW Sustainment Concept Plan

**INTELLIGENCE AND ELECTRONIC WARFARE (IEW)
AIRLAND BATTLEFIELD SUSTAINMENT**

CONCEPT PLAN



16 OCTOBER 1992

IEW Sustainment Concept Plan

REFERENCES

- A. Letter, CG AMC to VCSA, 20 Aug 91, Subject: Improvement of IEW Sustainment.
- B. Letter, CG, INSCOM to HQDA, 28 Oct 91, Subject: Logistics Study for IEW Equipment and NDI.
- C. Letter, VCSA to Commander, AMC, 01 Nov 91, Subject: System-by-System Review of Battlefield IEW Sustainment.
- D. Vice Chief of Staff, Army Message 012000Z Nov 91, Subject: Intelligence and Electronic Warfare Battlefield Sustainment Study.
- E. PEO-IEW, Message 061200Z Apr 92, Subject: Preparation for the New Family of IEW Systems.
- F. Commander, AMC Message 221831Z Jul 92, Subject: Logistics Power Projection.

PURPOSE

To obtain concurrence with the proposed Intelligence and Electric Warfare (IEW) Sustainment Streamlining Study recommendation for future sustainment of IEW equipment on the Airland battlefield.

OVERVIEW

The IEW Sustainment Streamlining Study was chartered by the Vice Chief of Staff of the Army to analyze the current IEW support structure and make a recommendation for improvement of the sustainment of Army IEW equipment. A key implied task was to identify the changes in doctrine and force structure needed to standardize sustainment of all Army IEW systems into the next century.

BACKGROUND

In November 1991, the Army Vice Chief of Staff chartered a study group under the direction of Army Materiel Command (AMC) to analyze the battlefield sustainment of IEW systems. United States Army CECOM Intelligence Materiel Management Center (USACIMMC) was assigned as the AMC study lead with HQ AMC oversight. Study principals were senior representatives from TRADOC, INSCOM, FORSCOM, SOCOM (USASOC), and PEO-IEW. The Study received HQDA

oversight from ODCSOPS, ODCSLOG, and ODCSINT. A synopsis of the study charter is as follows:

The objective of this analysis is to determine how to integrate and streamline battlefield sustainment of IEW operations on a dynamic and austere airland battlefield, with particular focus on support to key, advanced technology NDI and prototype systems.

VCSA HQDA Message 01 Nov 91

Over an eight month period, the Study examined current IEW and Army sustainment doctrine and emerging Army logistics policies and concepts. Additionally analysis extended to acquisition procedures, technology, training, USAR support needs, and systems level analysis of current and future IEW equipment.

The Study verified that IEW sustainment has evolved into a series of non-integrated "stovepipe" support arrangements in both peacetime and on the battlefield. This has resulted from a history of intense commodity management through intelligence and materiel developer (defined as Army MACOMs, PEOs, and DA DCSOPS) networks as opposed to logistics channels. IEW units have developed heavy reliance on contracts set up in a decentralized fashion by the MACOMs and materiel developers. This environment has produced confusing lines of support with limited visibility of sustainment assets above the MACOM level. The resultant impact has been fractional ownership of Army IEW sustainment policy and the use of non-standard logistics support methods by IEW units. The Study validated that support of multiple unique contract maintenance support structures was, indeed, a major hinderance to overall management of the Army IEW sustainment system during force deployment.

Logistics policies and concepts pertaining to IEW sustainment were analyzed. These include the US Army Ordnance Center and School (USAOC&S) draft vision document and the evolving logistics concepts of Integrated Sustainment Maintenance (ISM), Single Stock Fund (SSF), Logistics Support Group (LSG), and Forward Repair Activity (FRA). The impact of Objective Supply Capability (OSC), an automation system being developed by the Combined Arms Support Command (CASCOM), was also considered.

The Study determined doctrinal changes necessary to allow the Army to harness sustainment of rapidly advancing technology. The Army intelligence community will escalate the procurement of off-the-shelf NDI to keep up with state-of-the-art technology and new threats reflective of the changing world order. The Army's ability to maintain long term system design stability will decrease with advancing technology turnover rates, the increasing complexity of technology and component packaging techniques, and

the interdependency between software and hardware systems. To keep abreast of these evolving trends, the IEW logistics system must adjust support doctrine to incorporate effective and responsive sustainment methods. Given the rate of technology turnover, DOD logisticians will not be able to support Green Suit repair by applying traditional policies and requirements to system documentation and cataloging. Systems will be obsolete by the time traditional sustainment packages are in place. Under current acquisition focus, the Army will not be able to train soldier technicians and publish technical manuals fast enough to keep up with the rate of technology turnover. This will require team effort by highly trained soldier technicians, DOD civilian, and contractors to provide sustainment to the Army.

The current four-tiered system, with primary reliance on green-suit maintenance from unit through GS level, is not favorable to the support of the emerging generation of IEW systems. The two-tiered concept proposed by SLA, and supported by the Study, provides for repair as far forward on the battlefield as possible. The Study findings endorse enhanced capability at unit level and establishment of a permanent soldier and civilian integrated repair activity at the EAC (GS) level. An example, diagnostics, troubleshooting, and piece part replacement task capability is extended from the GS level forward to the unit level. Furthermore, access to OEM off-site repair will be executed from the forward IEW regional and unit augmentation repair activities as opposed to a flow back to a classic wholesale base for disposition. Additionally, system and maintenance software troubleshooting, repair, and reconfiguration capability will be integrated into the regional repair activity. The EAC repair activity will establish a centralized focal point for IEW maintenance under a single management framework and will facilitate the streamlining of IEW supply and maintenance efforts. Repair designations at each level will be driven by an optimum repair level analysis which ensures the most economic and responsive support for the Army as a whole. While all IEW tactical support was considered in the study, MFP-11 Joint Service programs were viewed as an exception to integrated support.

ASF/DLR policy is intended to save money because the user pays for all parts, has incentives to turn-in excess stocks, and has incentives to reduce inventory. Very few of the IEW systems are reflected in the Army Training Resource Model (TRM); furthermore, the funds that are identified are in gross error. This is a significant problem with conversion to a stock funded system. Most of the sustainment support for IEW systems has been direct funded in the past and very little cost history is available on these systems. Additionally, IEW reparable are very costly to procure. Current ASF credit procedures result in unit costs which far exceed actual cost to return the reparable to serviceable condition. As a result, a cost-based system of charges for repair and return actions by the AMC sustainment

activity is recommended. This cost-based system would charge the user for the parts, labor, and repair management administrative charges.

THE IEW SUSTAINMENT CONCEPT

The objective concept establishes AMC, USACIMMC as the Army Executive Agent for IEW logistics sustainment. This would designate clear single point responsibility within the Army for IEW Logistics Sustainment. All sustainment contracts and DA civilians will be centralized under the control of AMC. In addition, centralized support extends to systems fielded for prototyping analysis, independent of the level of acquisition management. This includes hardware and software sustainment resources supporting developmental, non-developmental items (NDI), and contractor logistics support (CLS) systems. The establishment of integrated support activities and enhanced fix forward capabilities for hardware and software maintenance, will provide a more responsive support structure.

UNIT LEVEL SUSTAINMENT

Under the current concept, the unit repairman is authorized to perform unit and direct support levels of maintenance which includes replacement of LRUs (black box) and circuit cards. The proposed concept removes the separate delineation of unit and direct support levels of maintenance and designates the MI battalion tasks as unit level maintenance. Under the concept unit level maintenance is authorized to accomplish up to and including piece-part (component) diagnostics and replacement when identified by a optimum repair level analysis. Typically this may result in the unit troubleshooting end items to the defective circuit card assembly and chassis mounted component. The changes to the current support concept will provide more flexibility to fix forward at the unit level, simplify the maintenance task allocation process, and eliminate non-value added costs associated with delineation of MI unit tasks as unit or direct support level of repair.

Very few IEW spares are currently carried on the supporting units ASL. Due to the low density and sporadic demand for these high value assets, IEW spares should be designated for mandatory stockage on the ASL. The objective concept allows for selected ASL spares to be maintained in the MI battalion, but they would be accountable on the division ASL to provide asset visibility, capture demand data, and generate budget information. This will insure that all transactions occur within the supply process and generate historical budget information.

Maintenance requirements beyond the unit level require requests to be processed through the supporting SSA. The actual hardware, from either the unit or SSA, will be retrograded to the

IEW regional repair activity. For items repairable at EAC, a request for replacement would be submitted through the SSA who would issue a work order for repair to the AMC regional repair activity. The unit would then deliver the hardware to the repair activity, with the SSA work order funding a cost-based repair (labor, parts, and administrative charges). If the ASL is not zero balanced, the unit would use the stocked item, the SSA would process a request for issue, submit the work order, and the unit would deliver the hardware to the repair activity. For items not repairable by the AMC regional repair activity, the requests for a replacement item would be processed into the wholesale system, but the hardware would still be turned in to the AMC regional repair activity for wholesale disposition. This will provide improved visibility of repairable assets and maintain these low density assets within the IEW repair channels, minimizing the possibility of loss. The hardware turn-in process would be consistent during peacetime and contingency operations, providing a single interface for the unit soldier during both.

EAC LEVEL SUSTAINMENT

Current EAC support for IEW systems is fragmented between multiple activities and contractors. Although these activities are frequently located close to each other, these activities and contractors often maintain separate equipment and facilities, requiring separate support agreements to be negotiated with the user. Under the proposed two-tiered concept, the equipment would be evacuated from the unit level directly to the EAC regional repair activity under the command and control of AMC. The AMC regional repair activity would centralize IEW maintenance management and would maximize integration of both the GS IEW Detachment and contractor/civilian regional support. Such an activity would differ from an SRA as prescribed in AR 750-1 in that it would be a permanent activity to provide in-depth support for IEW systems without regard to NSN. The interface between the unit level and the sustainment level will be improved as the MI unit will have a single repair activity supporting all IEW systems.

The AMC regional repair activity will maintain contractual repair linkage with OEM's as necessary to expedite OEM repair, and if required, OEM technicians would be physically integrated into the repair activity and units to provide dedicated system technical support. Another area of support being drawn into the AMC regional repair activity is software sustainment resources supporting developmental, non-developmental items (NDI), and contractor logistics support (CLS) systems. Software support will include software trouble report resolution, updating of system software, expedited software troubleshooting, and software operational support.

The regional and dedicated support, along with the OEM's, would rely on an expanded distribution system fine tuned for support to low density systems. Heavy reliance on state of the art transportation tracking and control technologies will be incorporated to provide heightened visibility for low density, high dollar value spares. This will provide support tailored for the region but responsive to unit needs and requirements.

Supply support at the EAC level currently varies by MACOM. Under the proposed concept the AMC activity would operate a mission supply support activity in support of the maintenance mission and would stock forward positioned wholesale IEW spares. The AMC regional repair activity assumes custodial ownership of all IEW spares at the EAC level. This would provide responsiveness, accountability, and visibility of all IEW spares above the unit level.

The IEW sustainment concept closely follows the evolving doctrine in both SLA and CASCUM under the Integrated Sustainment Maintenance concept. Under ISM, sustainment managers will be established at installation, regional, and national levels. Given this infrastructure, the AMC support cells providing dedicated unit level support would be responsive to the installation sustainment manager. The integrated regional EAC support cell would be responsive to the host installation sustainment manager for installation unit requirements and the regional sustainment manager for area based support requirements. At the national level, the Executive Agent for IEW Logistics Sustainment would be directly responsive to the national level sustainment manager for routine and contingency support requirements.

DEDICATED AUGMENTATION SUSTAINMENT

The concept endorses maximizing organic soldier maintenance at the unit level. Requirements above organic capabilities that require on-site augmentation by dedicated civilian based support to the unit are subject to AR 750-1, para 3-1(i). Examples of this support are IEW aviation units, MI brigades, unique equipment within the Corps/Theater staff, and unit level equipment under contractor logistics support (CLS).

CONTINGENCY SUSTAINMENT

Current planning for contingency operations requires each individual support contractor to arrange for deployment, procure facilities, and arrange a resupply and retrograde capability. The AMC regional repair activity will have a tailorable deployment mission in support of customer operational needs. The activity will deploy in support of the Logistics Support Group which will be under the operational control of the senior logistics officer in the theater. The initial deployment force under the new concept will be primarily the soldier base from the national and

regional support cells, task configured to support the specific contingency operation. Follow-on support from the civilian base will be deployed as necessary to augment and sustain the initial IEW support. The dedicated unit support would also be available for deployment. Operational and contingency constraints may require the dedicated unit support to be consolidated with the deployed IEW regional repair activity with on-call support to the units. A single activity arranging for deployment, facilities, and supply channels will be more efficient than the current multiple activity deployment. With a single support activity, the training and maintenance experience provided to soldiers and civilians will prepare them for multiple systems support when deployed, whereas today's support is compartmentalized.

METHODOLOGY

The IEW Sustainment Study Group continues their efforts to refine the overall streamlining concept. To ensure full documentation and implementation of the coordinated and approved concept, USACIMMC will continue to lead the IEW Sustainment effort. Upon successful demonstration the study team will integrate the concept into the overall Army logistics strategy by providing documentation and recommendations to Army activities for input to doctrinal regulations and field manuals.

Sustainment for current systems is funded through many different avenues, including PMS, user MACOMs, DA DCSOPS, and AMC. During the implementation phase, intensive efforts, guided by a financial working group, will focus on the funding issues in the current "stovepipe" structure to establish clear funding responsibilities and establishment of budget requirements. The Army must carefully orchestrate the funding of IEW system repairs by documenting funding costs, entering IEW systems into the TRM, providing a cost-based repair and return system, and by aligning non-standard systems to at least "look-alike" standard systems for DLR funding.

RESPONSIBILITIES

In continuance with current direction, HQ ODCSLOG will continue to provide oversight of the IEW Streamlining effort. The USACIMMC will continue leading the study group in its effort to implement future sustainment for the IEW battlefield. The study group, as appropriate, will continue to include representatives from TRADOC, INSCOM, FORSCOM, SOCOM, and PEO-IEW. Participants will be responsible for staffing and approval of the implementation actions within their MACOM. During concept test demonstration, an independent evaluator, such as AMSAA, will be used. Coordination, cooperation, and the needs of the Army are key to the rapid and successful implementation of the study group recommendations. The intent is to establish a streamlined,

responsive, integrated support structure for key advanced technology IEW systems as rapidly as possible, but in synchronization with other ongoing logistics efforts. Decisions relating to concepts, taskings, priority shifts, and problem resolution will be addressed through existing command channels.

Requests for exceptions to this standard system policy, other than MFP-11 programs, will be sent to HQDA, ATTN: DALO-SMC. A working group, comprising the system PM, MACOM of primary interest (for single user systems), AMC, SARDA, HQDA DCSOPS, and HQDA DCSLOG will conduct an initial review and write recommendations for final approval at a general officer level review by AMC, SARDA, HQDA DCSOPS, and HQDA DCSLOG. This procedure follows the SLA non-standard systems criteria and may be altered by the HQDA DCSLOG as appropriate.

TASKS AND GUIDANCE

The IEW Streamlining Study Team will take action to achieve the tasks indicated below. Inherent and impacting actions will be identified which must be achieved to complete the implementation of the approved Study Group concept. The Study members will identify inherent actions by their MACOM for concurrent implementation and action.

1. Develop a comprehensive concept implementation plan to include test demonstration procedures with evaluation criteria. The test demonstration will be conducted at multiple locations and will include an independent evaluator. (Principal Study Group/SLA)
2. Create a financial process work group to establish a special MDEP to capture all concept related resource requirements, and tracking of execution for compilation of detailed cost analysis. The group will manage realignment of budgeted resources and establishment of IEW systems as part of the HQ DA Training Resource Model (TRM) for MACOM funding allocations. Additionally, the financial process work group will recommend a method of DBOF policy implementation for IEW low-density, single-user, and CLS supported systems. (Principal Study Group)
3. Conduct detailed analysis of all IEW non-standard systems for inclusion into the Army stock fund process or exemption request as outlined by the Strategic Logistic Agency. (SLA/Principal Study Group)
4. Develop cost-based repair guidelines and an implementation procedure for cost-based repair and return. (Principal Study Group)

5. Delineate all IEW sustainment contract and civilian support mechanisms and establish a time phased plan for transition within AMC. (AMC)
6. Document the integrated AMC IEW regional repair activity to delineate core civilian and military personnel and equipment requirements. (Principal Study Group)
7. Recommend to the HQ DA DCSLOG a tailored acquisition logistics development and fielding model to support the new concept. (Principal Study Group)
8. Determine the need to study the Army Basis of Issue Plan (BOIP) development process. (HQ DA DCSOPS/TRADOC)

TIMELINE/MILESTONES

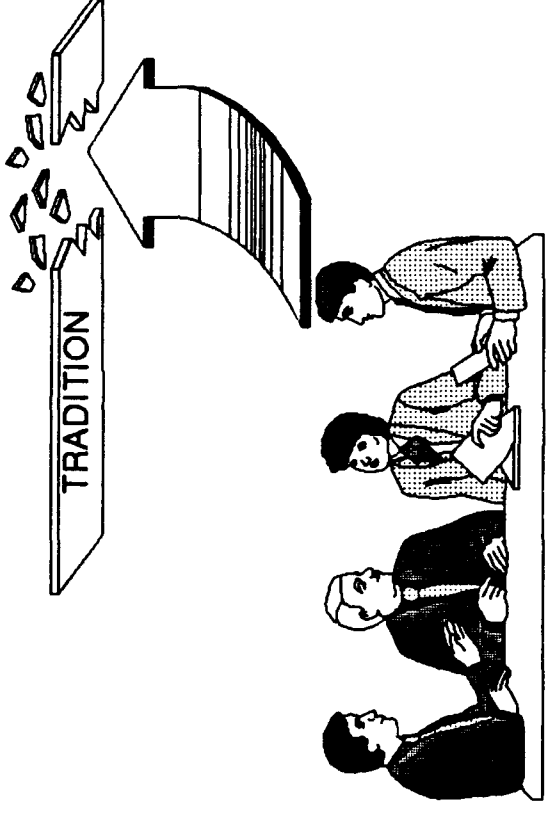
The IEW Sustainment Streamlining study concept will be tested before final implementation. The test demonstrations and analysis of the results will be performed during a fifteen month period following concept approval. A detailed implementation plan will be developed within three months of approval. The implementation plan will identify plans and procedures required to demonstrate and evaluate the study concept, and initiates process planning for follow-on implementation. A plan for time phased transition of all civilian support requirements under the single control of AMC will be developed within six months of concept approval. The integration of military, contractor, and DOD civilian resources under single command and control and dedicated civilian augmentation to specific unit requirements will both be tested prior to full scale implementation of the concept. Regional support tests are planned to be accomplished at both Ft. Hood (during the SLA ISM test) and in Korea. AMC augmentation at unit level will be tested at the 204th MI BN, Augsburg Germany, and 201st MI BN, Vint Hill Farms Station, in support of one of a kind systems. Each test is planned for a six month interval which will allow for data collection and analysis over the test period with finalization of results and conclusions by the end of the fifteen month period. Approval for full implementation of the concept across the total Army will be driven by successful demonstration test results.

SUMMARY

The total integration of IEW sustainment under AMC will provide the Army with a clear single point sustainment ownership for responsive support to the combat commander. This concept retains an environment for intensive management of low density, high dollar, highly complex assets with integration of IEW sustainment into the emerging mainstream Army logistics support methodology. Study anticipates resource savings, at the Army level, in addition to an improved sustainment posture.

Appendix G
Final Report Briefing Graphics

INTELLIGENCE AND ELECTRONIC WARFARE SUSTAINMENT AND STREAMLINING STUDY FINAL REPORT



16 OCTOBER 1992

OUTLINE

- **PURPOSE**
- **TASKING REVIEW**
- **DISCUSSION OF FACTS**
- **PROPOSED CONCEPT**
- **RECOMMENDATION**

PURPOSE OF BRIEF

- **PRESENT THE STUDY RESULTS**
- **HQDA GOSC APPROVE**
- **STUDY RECOMMENDATIONS**
- **FORWARDING CONCEPT TO VCSA THRU
AMC COMMANDER**

STUDY DRIVERS

OPERATION DESERT SHIELD AND DESERT STORM SUSTAINMENT

- UTILIZATION OF:
 - NON-DEVELOPMENTAL SYSTEMS
 - TRAINING AND EXPERIMENTAL SYSTEMS
 - STANDARD ARMY SYSTEMS
- SUPPORT EXECUTED BY MULTIPLE ARMY ORGANIZATIONS

REDUCTION OF DUPLICATIVE EFFORTS ASSOCIATED WITH:

- MULTIPLE SUPPORT CONTRACTS
- CONTRACTOR AND GOV'T MANAGEMENT OVERHEAD
- FACILITIES (ON-SITE AND OFF-SITE)

INSTITUTIONALIZED RESPONSIVE DOCTRINE

GENERALS TUTTLE AND SCANLON

PROBLEM STATEMENT

" ... THE OBJECTIVE OF THIS ANALYSIS IS TO DETERMINE HOW
TO **INTEGRATE** AND **STREAMLINE** BATTLEFIELD SUSTAINMENT
OF IEW OPERATIONS ON A DYNAMIC AND AUSTERE
AIRLAND BATTLEFIELD, WITH PARTICULAR FOCUS ON SUPPORT
TO **KEY, ADVANCED** TECHNOLOGY **NDI AND PROTOTYPE SYSTEMS** .

VCSA HQDA MESSAGE DTG 012000Z NOV 91

STUDY PARTICIPATION

INITIAL

HQDA

ODCSOPS - OVERSIGHT LEAD
ODCSLOG
ODCSINT

USAMC

HQAMC - OVERSIGHT
CIMMC - STUDY LEAD

USFORSCOM

FCJ2 - LEAD
FCJ4

USATRADOC

INTEL CTR & SCH

USAINSCOM

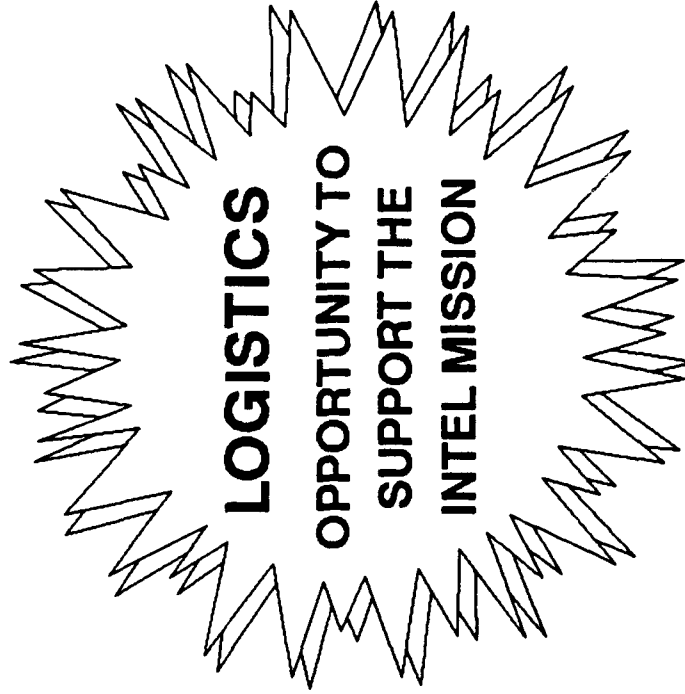
ODCSLOG

USASOC

J2

PEO-IEW

LOGISTICS



CURRENT

HQDA

ODCSOPS
ODCSLOG - OVERSIGHT LEAD
ODCSINT

USAMC

HQAMC - OVERSIGHT
CIMMC - STUDY LEAD

USFORSCOM

FCJ2
FCJ4 - LEAD

USATRADOC

INTEL CTR & SCH - LEAD
CASCOM
OMMC & SCH
ISD

USAINSCOM

ODCSLOG

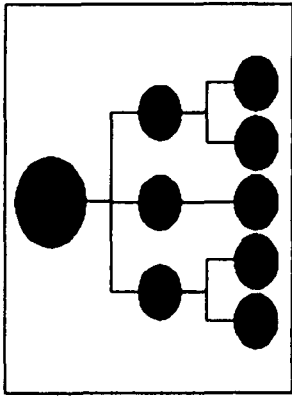
USASOC

J4

PEO-IEW

LOGISTICS

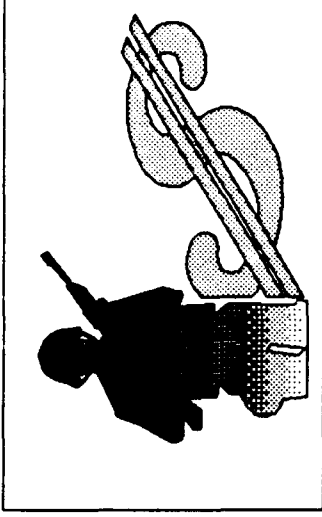
DISCUSSION OF FACTS



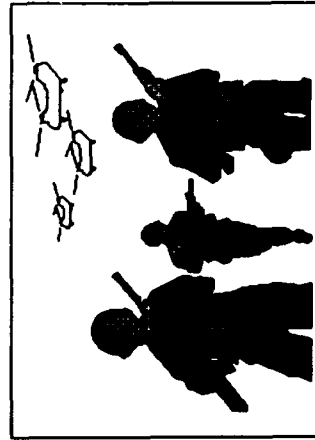
SUSTAINMENT ORGANIZATION



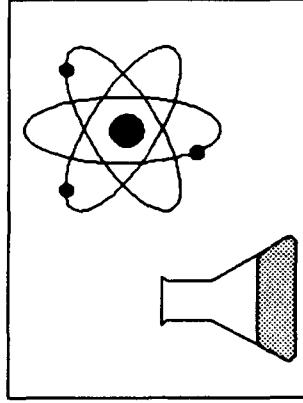
DESERT SHIELD/STORM



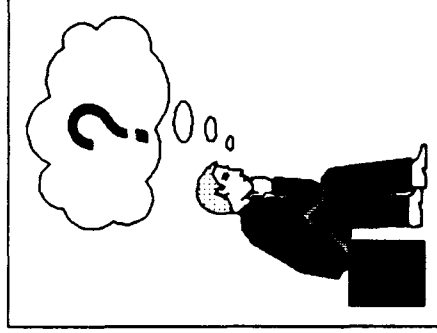
ARMY STOCK FUND



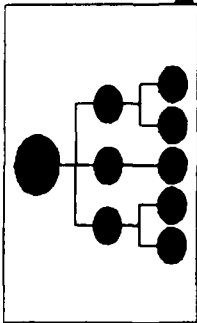
FORCE STRUCTURE



TECHNOLOGY/ACQUISITION

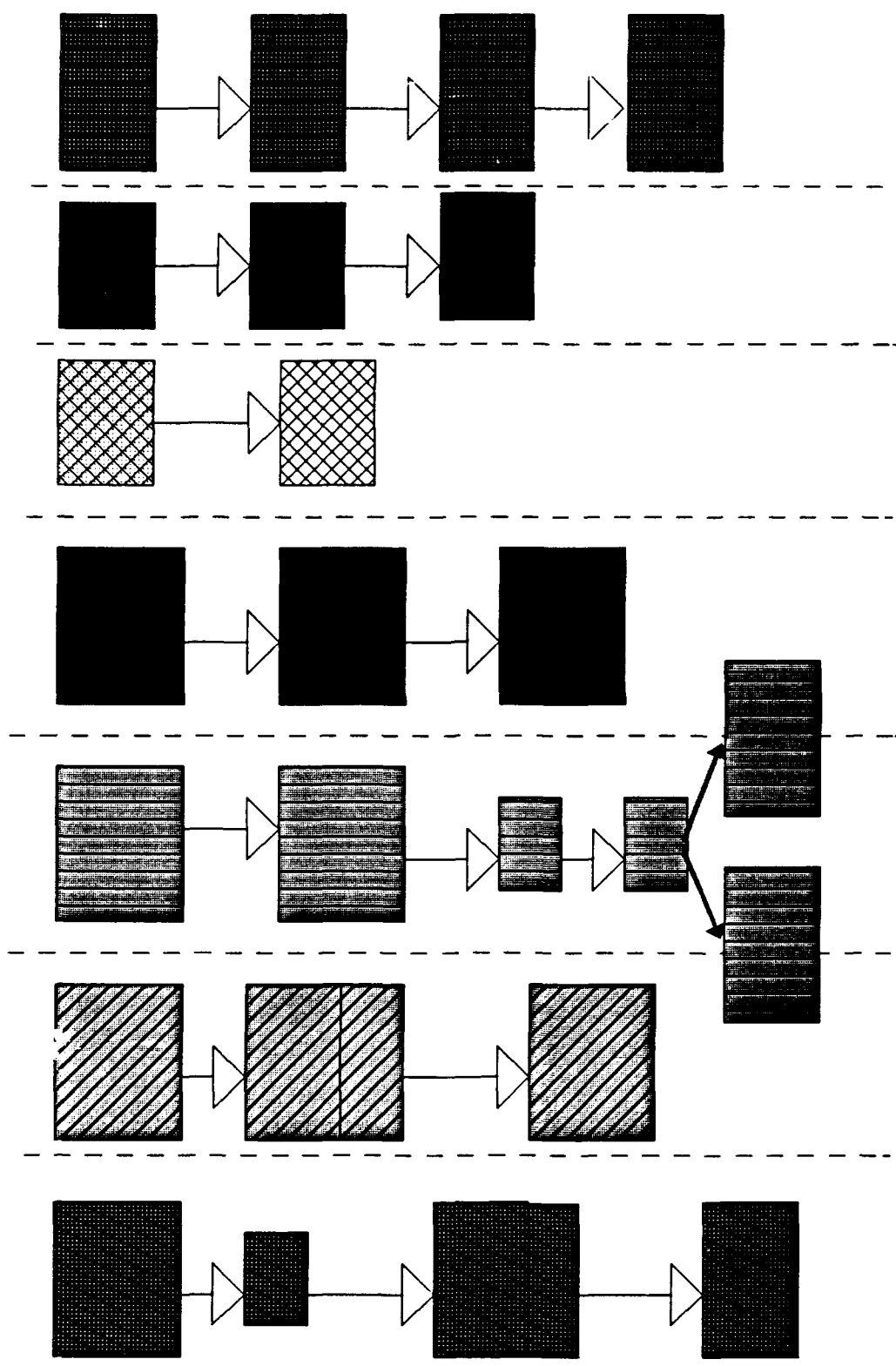


EVOLVING CONCEPTS



INTELLIGENCE SUPPORT

SUSTAINMENT ORGANIZATION



FRAGMENTED ACROSS ARMY

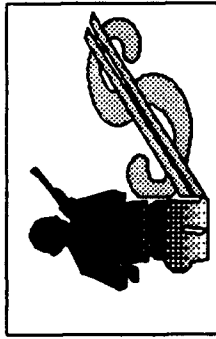


DSS ISSUES

DESERT SHIELD/STORM

- Confused Ownership of MI GS Detachments
- Deployment of Additional Support Structures
- Compartmented vs Integrated Sustainment Capabilities
- No Centralized Contractor/DAC Control/Accountability
- IEW Sustainment Plan Theater Developed (Feb 91)

FACTS



ARMY STOCK FUND

Supply Management Army (Army Stock Fund)

- IEW Support Has Multiple Funding Schemes
- DA Training Resource Model Data Incomplete
- User Demands Equitable Repair Cost

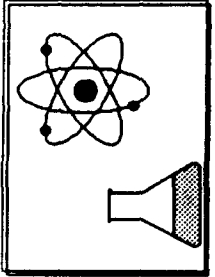
ARMY
Wide



FORCE STRUCTURE

Force Structure

- RC No Organic GS - Limited DS
- ORD (Maint) Co (GS) Establishes COMSEC/IEW Repair Plt.
- TAA99 Reduces GS to 2 COMSEC/IEW PLTs Worldwide
- FORSCOM Scrub Proposes 4 Plts Worldwide



FACTS

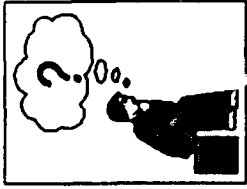
TECHNOLOGY/ACQUISITION

Acquisition/Technology

- Technology Insertion Key
- Increased Field Prototyping
- NDI Utilization Will Grow
- HDW/SW Interdependence Drives Integrated Repair Skills
- Technology/Density Drives Source of Repair
- BOIP Not Responsive to Needs - Army Wide



OEM Skills Available



EVOLVING LOGISTICS CONCEPTS

- Integrated Sustainment Maintenance
AMC Owns & Executes All Sustainment Echelons Above DS
Establishes National, Regional and Installation Sust. Mgr.
- Single Stock Fund
AMC Manages Stock Fund
Merges Retail and Wholesale Stock Funds
Affects Echelons Above Direct Support
- Objective Supply Capability
Asset Visibility Down to Division Stock Accounts
Cross Levels Stock Across Retail Accounts
- Readiness Based Maintenance
Drives Maint. & "Push" Supply Priorities

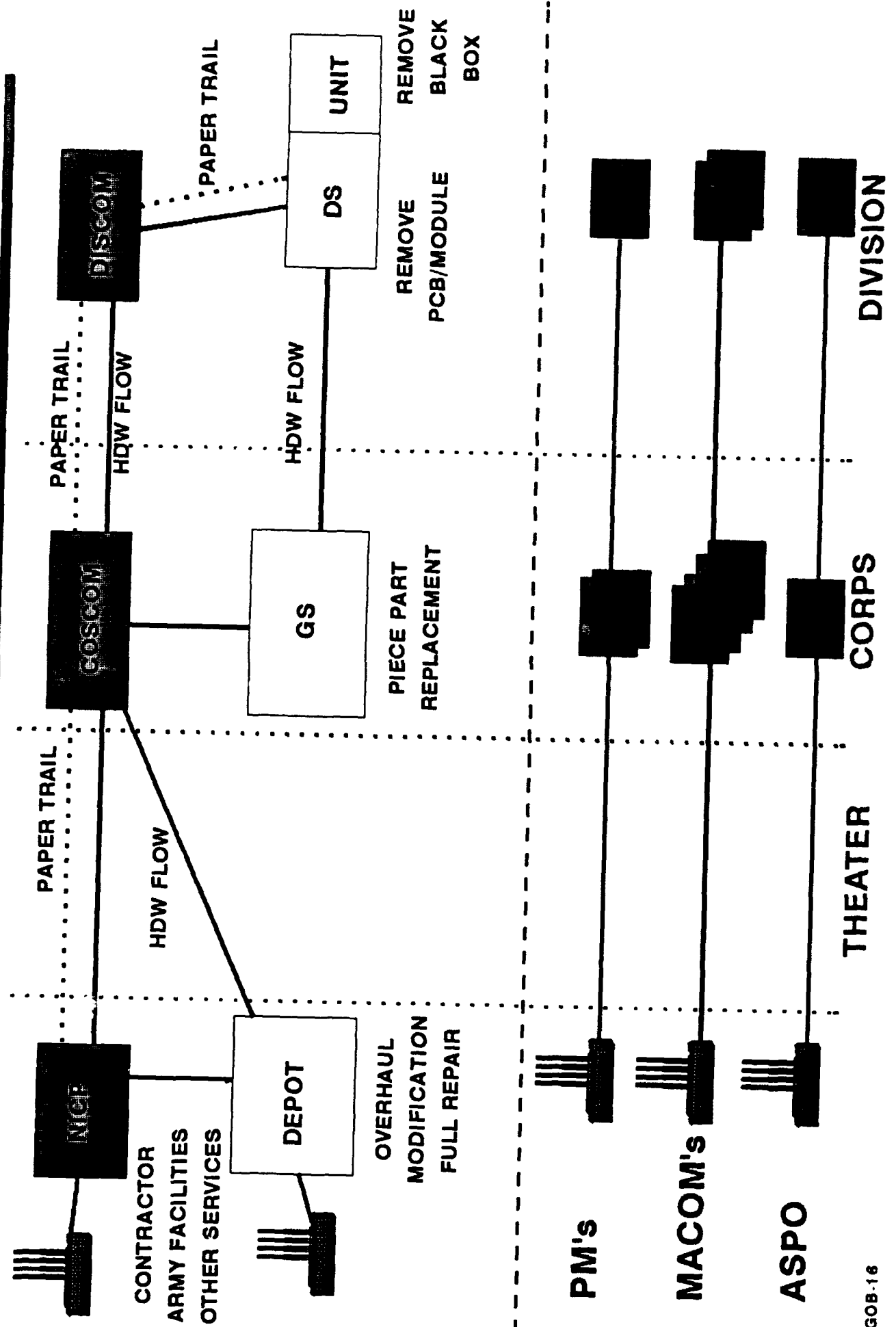
OUTLINE

- PURPOSE
- TASKING REVIEW
- DISCUSSION OF FACTS
- ➡ • PROPOSED CONCEPT
- RECOMMENDATION

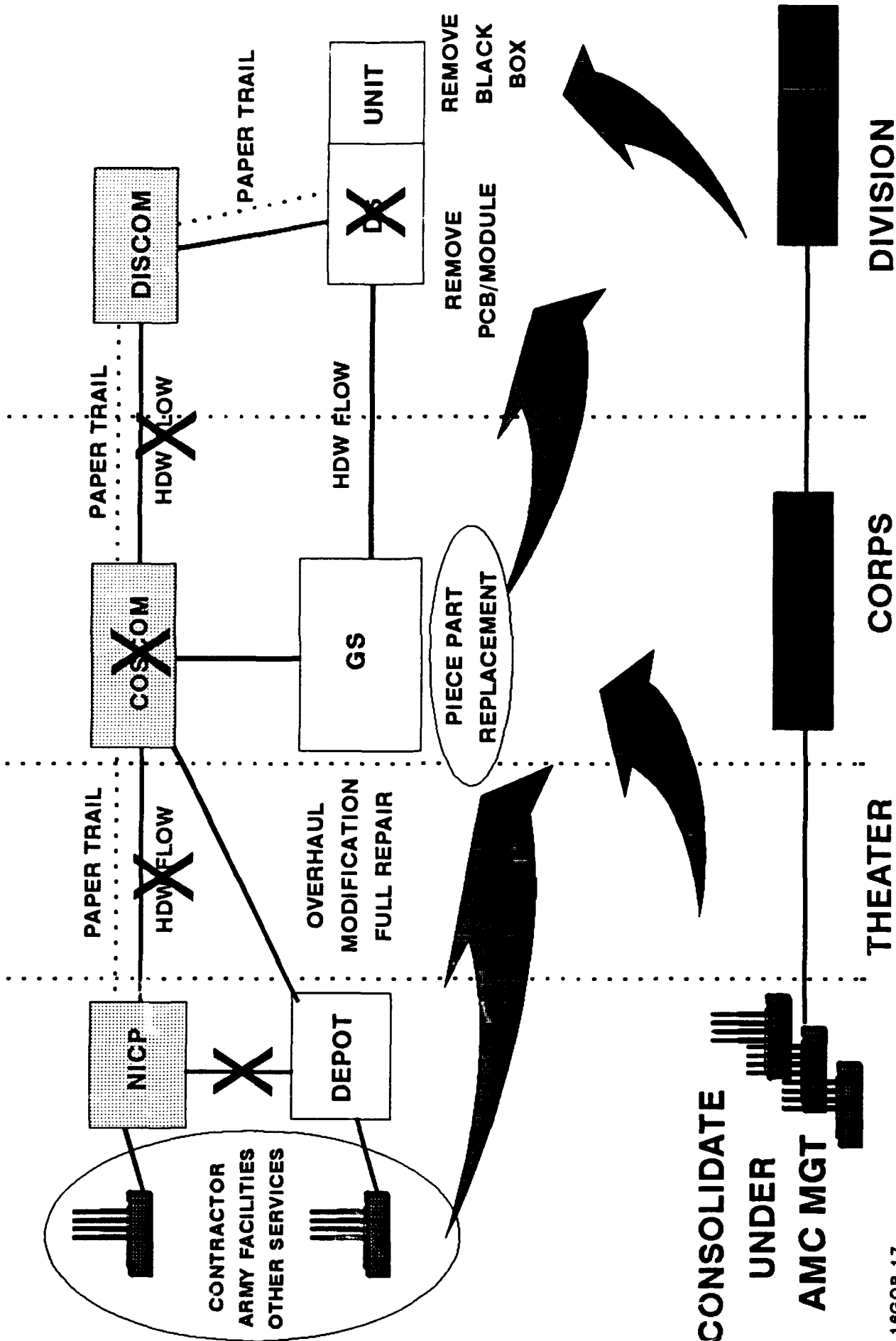
STUDY TEAM OBJECTIVES

- MAINTAIN STRONG SOLDIER SUPPORT BASE (EAC/ECB)
- MAXIMIZE "FIX FORWARD" CAPABILITY IN BATTLEFIELD
- INTEGRATE AND CONTROL CONTRACTOR UTILIZATION
- SUSTAIN TECHNOLOGY INSERTION AND QUICK REACTION NEEDS
- REDUCE CONTRACT, FACILITY AND OVERHEAD REQUIREMENTS
- COMPLY WITH DA/AMC LOGISTICS OBJECTIVES

CURRENT SUPPORT

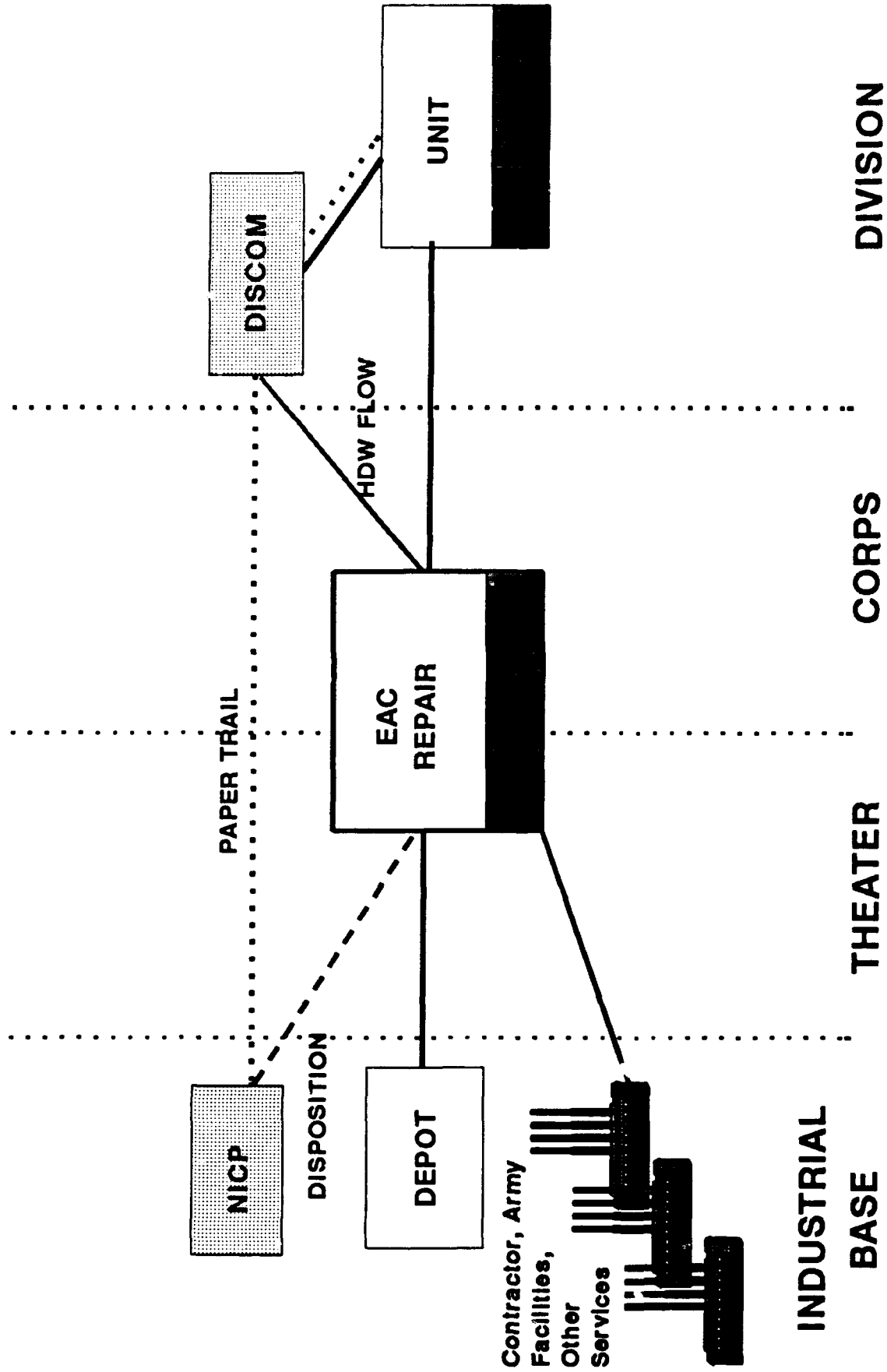


"FIX FORWARD"



**CONSOLIDATE
UNDER
AMC MGT**

PROPOSED SUPPORT



EAC INTEGRATED REPAIR

CORE

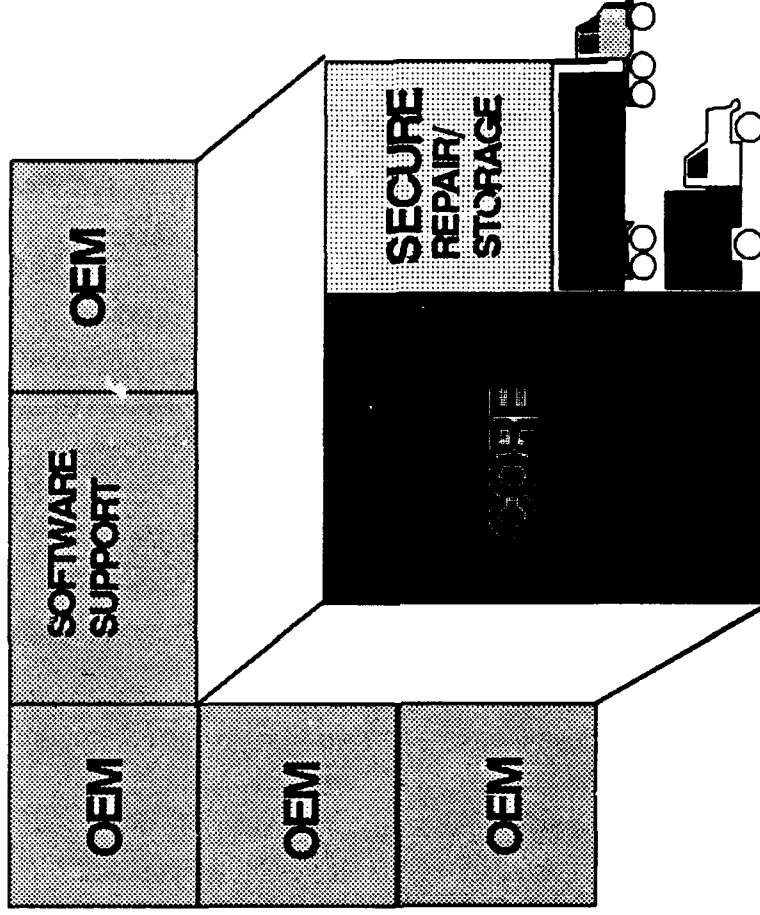
PERSONNEL -

MILITARY (GS DET)
DEPOT

OMNIBUS CONTRACTOR
LOGISTIC ASST. REPS

CAPABILITIES -

MAINTENANCE
SUPPLY MGT
TRANSPORTATION
CUSTOMER ASST
SITE MGT



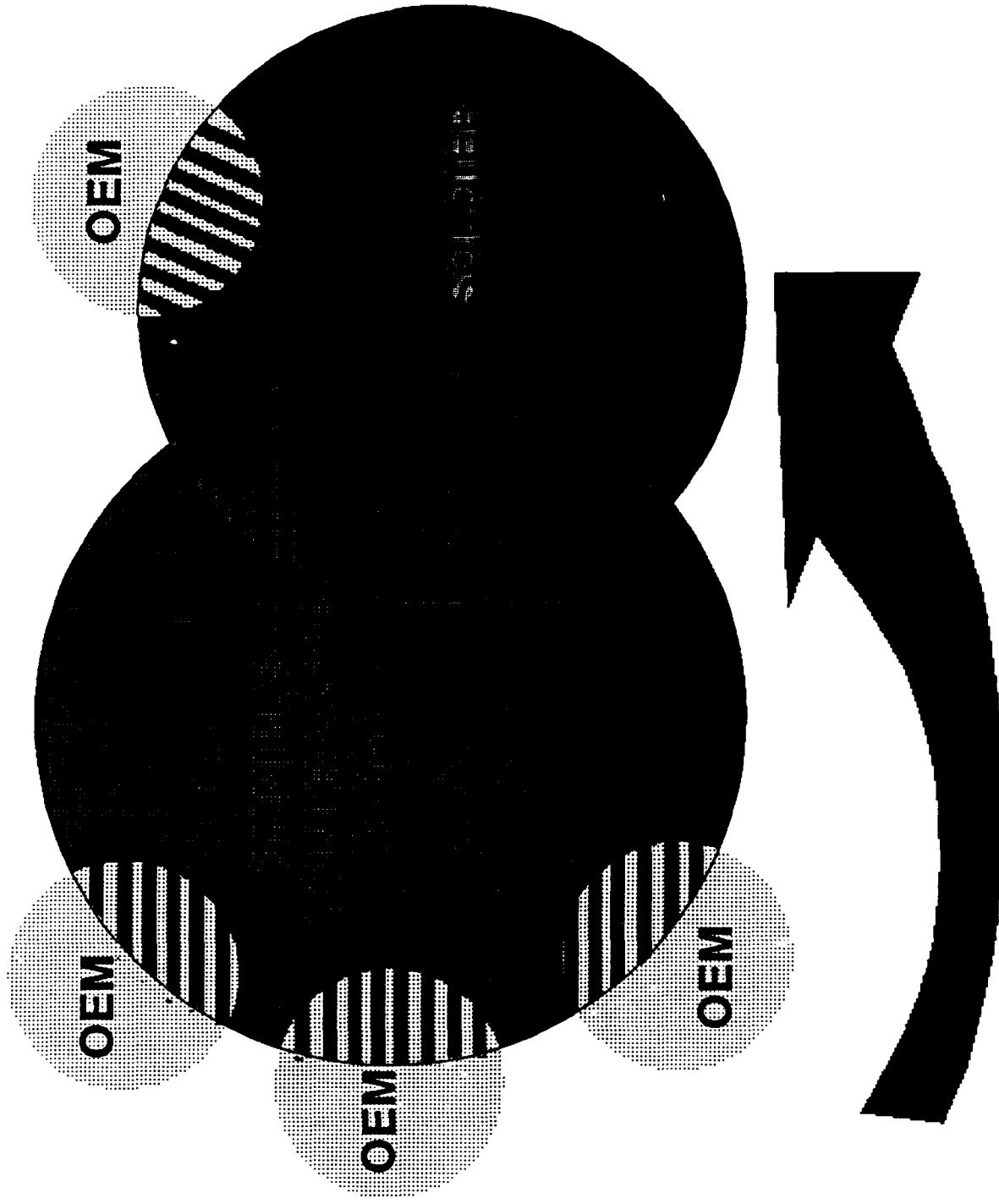
Tailored to Mission Needs

FORSCOM NDI EXPERIENCE

- Soldier Support Very Effective
- Support Documentation Mix of Commercial/Military Data
- Current Level of Documentation Evolved Over Time
- Hot Mock-Ups Provided
- Off-Line Supply Support Provided Through J2
- As With Std Sys, Available Skills Subject to Troop Turnover
- Heavily Dependent on Contractor-Provided Training

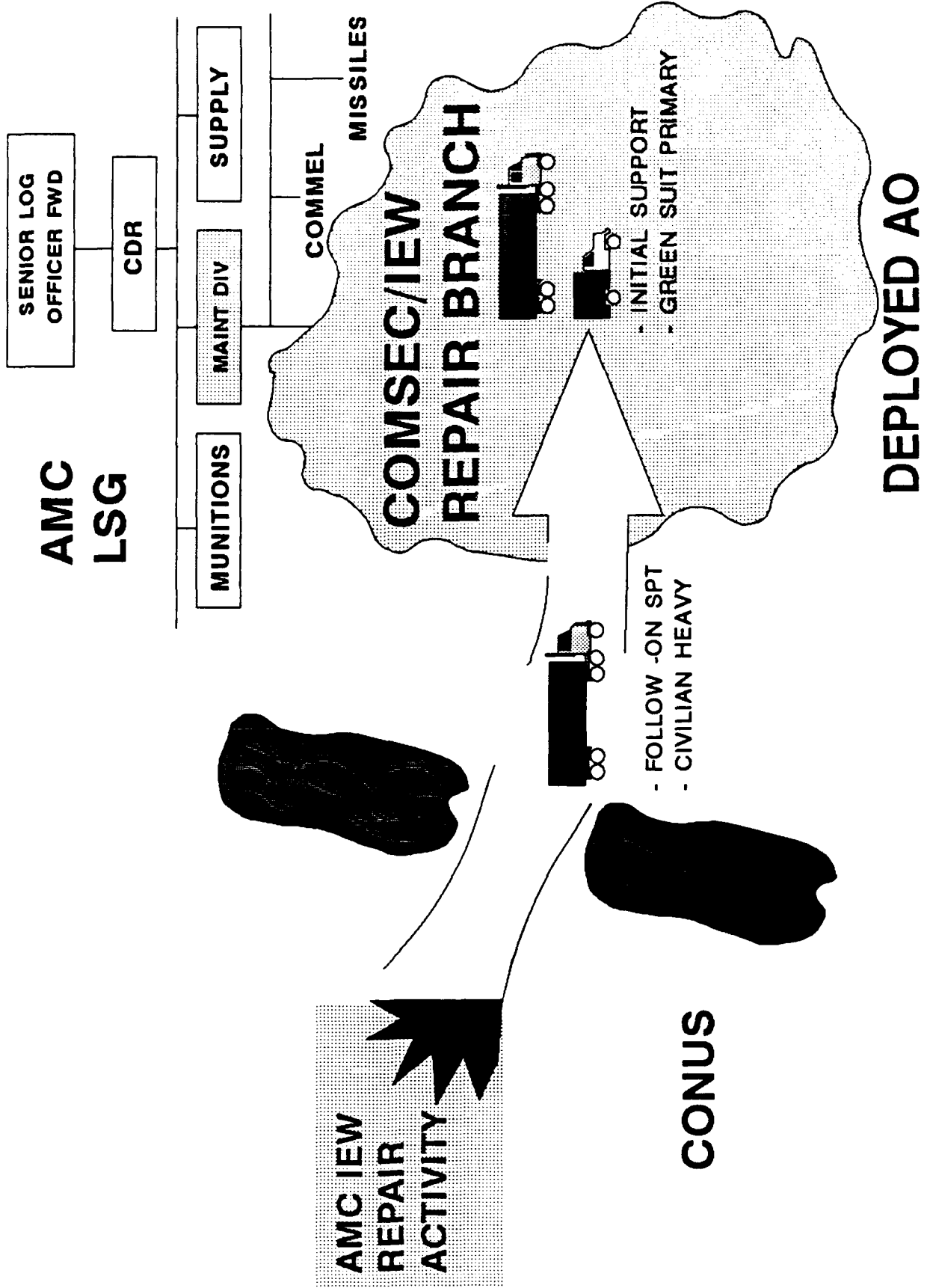
**EVOLUTIONARY PROCESS
NOT A TURN-KEY OPERATION.**

KNOWLEDGE TRANSFER KEY

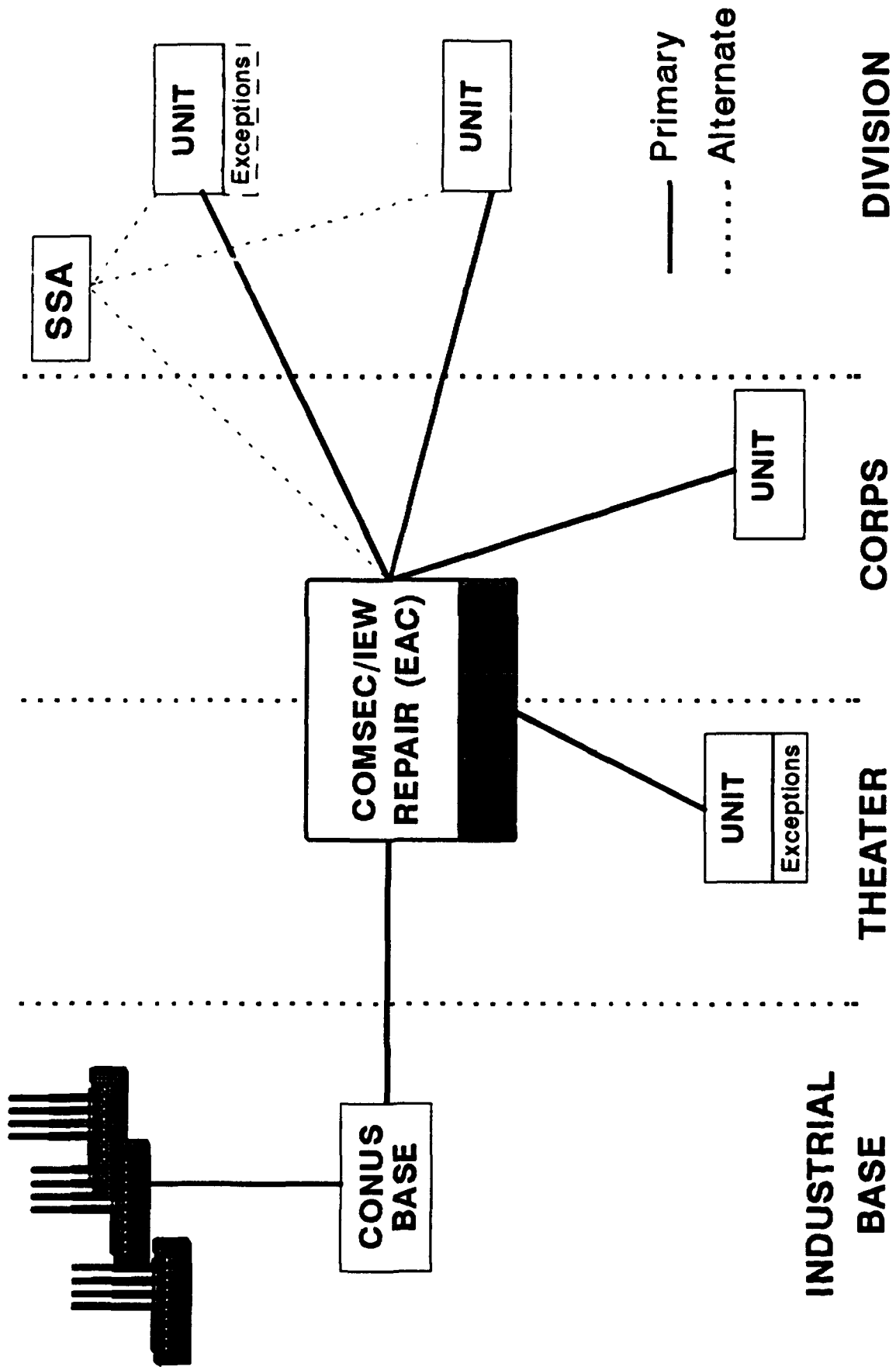


FOCUSED ON SOLDIER SKILL ENHANCEMENT

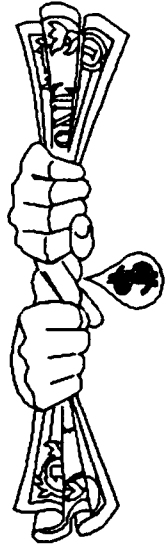
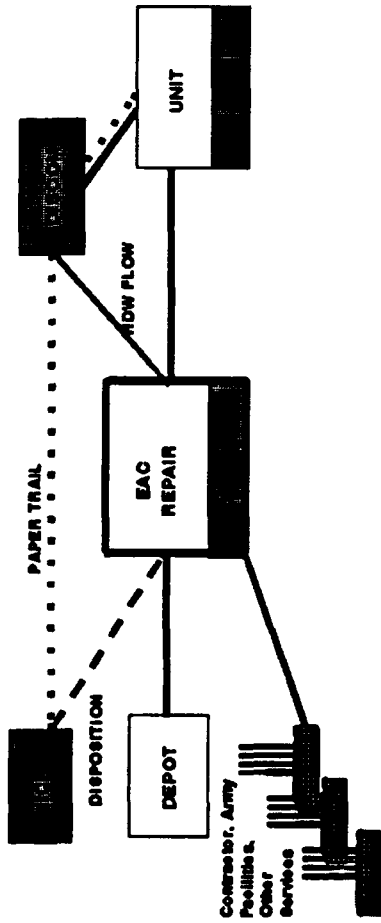
LOGISTIC SPT GROUP INTEGRATION



DEPLOYED SUPPORT (HARDWARE FLOW)



IMPROVED READINESS



MISSION

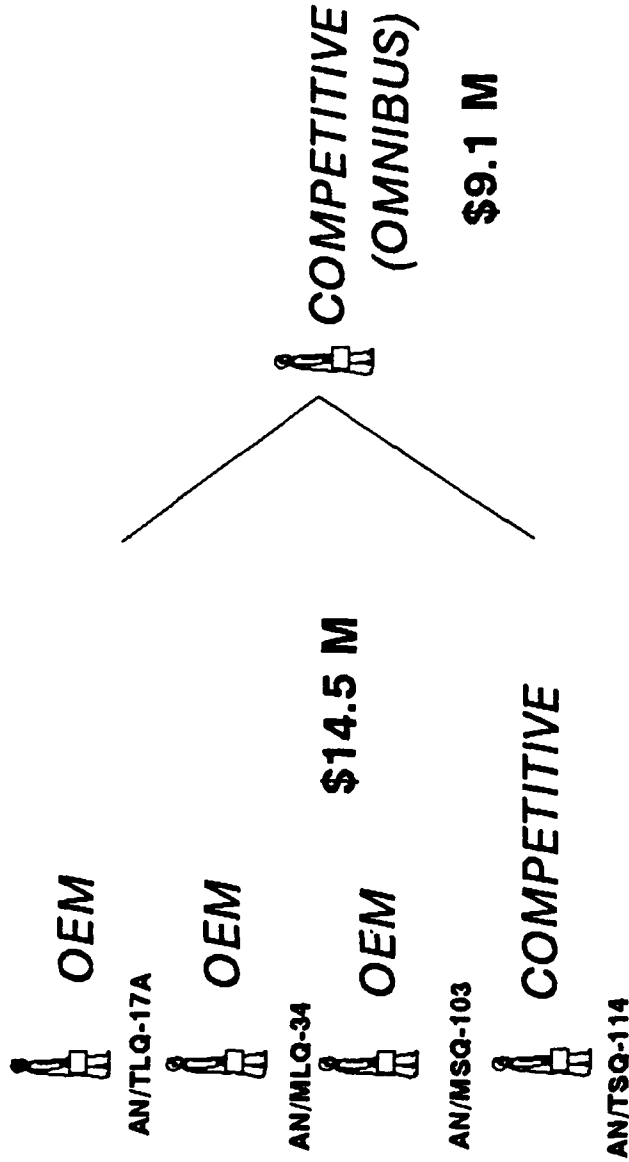
- Reduced Turnaround time
- Maintains Fix Forward
- One Stop Service
- Enhanced Spares Visibility
- Single Deploying EAC Support Base
- Enhanced Soldier/Civilian Teaming

\$ SAVINGS

- Reduced Facilities
- Less TMDE Required
- Reduced Gov't Contracts and Overhead
- Reduced Contractor Personnel
- Fewer Intraservice Support Agreements

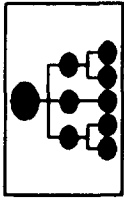
DEMONSTRATED INTEGRATION

FY89 CONTRACT MAINTENANCE CONSOLIDATION

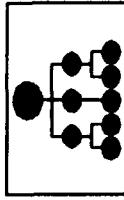


- * SUSTAINED SHORT TERM READINESS
- * IMPROVED LONG TERM READINESS
- * REDUCED USER INTERFACES
- * MAINTAINED FORWARD REPAIR
- * REDUCED GOV'T CONTRACTS 75%
- * REDUCED CONTRACTOR PERSONNEL, TMDE,
AND FACILITY REQUIREMENTS
- * \$ 5.4 M FIRST YEAR SAVINGS

RECOMMENDATIONS



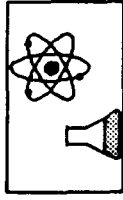
ESTABLISH USAMC, USACIMMC, EXECUTIVE AGENT for
BATTLEFIELD LOGISTICS SUSTAINMENT



TIME-PHASED CONSOLIDATION OF ALL SUSTAINMENT
CONTRACTS UNDER USAMC CONTROL (EXCEPT MFP-11,
JOINT PROGRAMS)



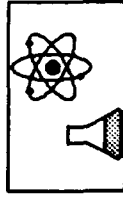
ESTABLISH FINANCIAL PROCESS WORKGROUP



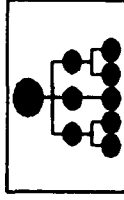
DEVELOPMENT OF A TAILORED ACQUISITION LOGISTICS DATA
DEVELOPMENT AND FIELDING MODEL FOR AMC and DA
DCSLOG APPROVAL



SUPPORT FORSCOM PROPOSAL FOR 4 COMSEC/IEW PLTs
WORLDWIDE



ENDORSE VCSA TASKING TO IMPROVE SYSTEM
DOCUMENTATION PROCESS



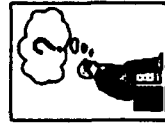
DA DCSLOG MUST APPROVE SUPPORT EXCEPTIONS

RECOMMENDATIONS

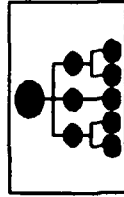
EAC SUPPORT



FULL INTEGRATION OF THE MI GS MAINTENANCE DET/PLT WITH AMC CONTROLLED CIVILIAN ELEMENT



CONSOLIDATION OF GS MILITARY and CIVILIAN RESOURCES UNDER AMC COMMAND and CONTROL

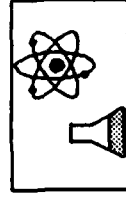


ESTABLISH A MISSION SUPPLY SUPPORT ACTIVITY (AS REQUIRED)



ESTABLISH A REPAIR PRICE vs CURRENT STOCK FUND EXCHANGE PRICE

UNIT SUPPORT



DEDICATED AUGMENTATION TO BN/BDE's FOR SPECIAL SUPPORT REQUIREMENTS



RECOGNIZE UNIT LEVEL REPAIR CAPABILITY OF PIECE PART REPLACEMENT ACTIONS

IMPLEMENTATION RESOURCES

- * USACIMMC AUTHORITY TO HIRE TO FY93 FUNDED STRENGTH
- * \$3.5M CCSS and SDS AUTOMATION SHORTFALL FUNDING
- * \$100K TRAVEL (DEMONSTRATION COORD., PRINCIPAL STUDY GROUP REVIEWS and FINANCIAL PROCESS WORKGROUP MEETINGS)
- * PROGRAMMED DOLLARS/MANYEARS FOR TRANSITIONED SUSTAINMENT CONTRACTS (AS ADJUSTED BY FINANCIAL PROCESS WORKGROUP)
- * DELAY DBOF CONVERSION UNTIL FY96 (PENDING RESOLUTION OF FINANCIAL ISSUES AND REPAIR RATE ESTABLISHMENT)

KEY IMPLEMENTATION TASKS

- | | UPON
<u>APPROVAL</u> |
|---|-------------------------|
| • DEVELOP IMPLEMENTATION PLAN | 3 MONTHS
(CONCEPT) |
| • CONDUCT CONCEPT DEMONSTRATIONS | 12 MONTHS
(PLAN) |
| •• SITE TBD (TIED TO ISM DEMONSTRATION) | |
| •• KOREA (501ST/102ND), GERMANY (204TH), VHFS (201ST) | |
| • CONDUCT ANALYSIS OF TRANSITIONED NON-STD LOGISTICS SYSTEMS FOR INCLUSION/EXEMPTION TO ARMY STOCK FUND | 6 MONTHS
(PLAN) |
| • ESTABLISH TIME-PHASED PLAN FOR CONTRACT CONSOLIDATION | 6 MONTHS
(PLAN) |
| • OBTAIN CHARTER FOR FINANCIAL PROCESS WORKGROUP | 3 MONTHS
(PLAN) |

RECOMMENDATION

- **HQDA GOSC APPROVE**
- **STUDY RECOMMENDATIONS**
- **FORWARDING CONCEPT TO VCSA THRU
AMC COMMANDER**

Glossary of Abbreviations

Glossary of Abbreviations

AC	Active Component
ACOR	Assistant contracting officer's representative
AIT	Advanced individual training
AMC	Army Materiel Command
ANCOC	Advanced NCO Course
AOAP	Army Oil Analysis Program
AOD	Area oriented depot
AR	Army Regulation
ASF	Army stock fund
ASL	Authorized stockage list
ASPO	Army Space Programs Office
AVCRAD	Aviation classification repair activity depot
AVIM	Aviation intermediate maintenance
Avn	Aviation
AVUM	Aviation unit maintenance
BEMT	Basic electronic maintenance trainer
BIT/BITE	Built-in test/built-in test equipment
Bn	Battalion
BNCO	Basic NCO Course
BOIP	Basis of issue plan
CCA	Circuit card assembly
C-E	Communications-electronics
CECOM	Communications-Electronics Command
CFSR	Contractor field service representative
CIMMC	CECOM Intelligence Materiel Management Center
CLS	Contractor logistics support
CMF	Career management field
CMMC	Corps materiel management center
COEA	Cost and operational effectiveness analysis
COMINT	Communications intelligence
CONUS	Continental United States
COR	Contracting officer's representative
COSCOM	Corps support command
COTR	Contracting officer's technical representative
CSS	Combat service support
CTT	Commander's Tactical Terminal
DA	Department of the Army
DBOF	Defense Business Operations Fund
DCSLOG	Deputy Chief of Staff for Logistics
DESCOM	Depot System Command
DLA	Defense Logistics Agency
DMRD	Defense management review decision
DOD	Department of Defense
DOL	Director(ate) of Logistics
DS	Direct support

DS/S	Operation DESERT SHIELD/DESERT STORM (see ODS)
DSU	Direct support unit
EAC	Echelons above corps
ECB	Echelons corps and below
ELINT	Electronic intelligence
EPDS	Electronic Processing and Dissemination System
ETUT	Enhanced Tactical Users' Terminal
EW	Electronic warfare
FAISS	FORSCOM Automated Intelligence Support System
FAR	Federal Acquisition Regulations
FY	Fiscal year
FORSCOM	Forces Command
FRA	Forward repair activity
GBCS-H	Ground Based Common Sensor - Heavy
GBCS-L	Ground Based Common Sensor - Light
GRCS	GUARDRAIL Common Sensor
GRV	GUARDRAIL V
GS	General support
GSA	General Services Administration
GSM	Ground station module
GSU	General support unit
HQDA	Headquarters, Department of the Army
ICS	Interim contractor support
IES	Imagery Exploitation System
IEW	Intelligence and electronic warfare
IGRV	Improved GUARDRAIL V
ILS	Integrated logistics support
ILSP	Integrated logistics support plan
IMETS	Integrated Meteorological System
INSCOM	Intelligence and Security Command
IPDS	Imagery Processing and Dissemination System
ISM	Integrated sustainment maintenance
ISMM	Integrated sustainment maintenance manager
JSTARS	Joint Surveillance and Target Attack Radar System
KO	Contracting officer
KTO	Kuwaiti theater of operations
LAO	Logistics assistance office(r)
LAP	Logistics assistance program
LAR	Logistics assistance representative
LIN	Line item number
LMRDFS	Lightweight Manportable Radio Direction Finding System
LRU	Line replaceable unit
LSG	Logistics support group
MAC	Maintenance allocation chart
MACOM	Major Army Command
MANPACK DF	Manpackable Direction Finder
MANPRINT	Manpower and personnel integration

MARC	Manpower requirements criteria
MDEP	Management decision package
MI	Military intelligence
MMC	Materiel management center
MOS	Military occupational specialty
MRC	Materiel readiness command
MSC	Major subordinate command
MTOE	Modification table of organization and equipment
MWO	Modification work order
NDI	Nondevelopmental item
NET	New equipment training
NETP	New equipment training plan
NGB	National Guard Bureau
NICP	National inventory control point
NMP	National maintenance point
NSN	National stock number
OCAR	Office of the Chief of the Army Reserve
ODS	Operation DESERT SHIELD/DESERT STORM (see DS/S)
OEM	Original equipment manufacturer
OJT	On the job training
OMA	Operations and maintenance, Army
OPCON	Operational control
OUTS	Operational Unit Transportable System
PEO-IEW	Program Executive Office(r)-IEW
PERSCOM	Total Army Personnel Command
PLL	Prescribed load list
PM	Program manager, project manager
PMCS	Preventive maintenance checks and services
PWRMS	Prepositioned war reserve materiel stocks
QQPRI	Qualitative and quantitative personnel requirements information
RC	Reserve Component
RX	Reparable exchange
RXA	Reparable exchange activity
SDC	Sample data collection
SDS	Standard Depot System
SFDLR	Stock funding of depot level reparables
SIDPERS	Standard Installation/Division Personnel System
SIGINT	Signals intelligence
SLA	Strategic Logistics Agency
SLAR	Side Looking Airborne Radar
SOCOM	U.S. Special Operations Command
SOCRATES	Special Operations Command Research, Analysis, and Threat Evaluation System
SOF	Special operations force(s)
SPOD	Sea port of debarkation
SRA	Special repair activity
SRU	Shop replacement unit

SSA	Supply support activity
SSMS	SOF SIGINT Manpack System
STAMIS	Standard Army Management Information System
TA	Theater army
TAA	Total Army Analysis
TAACOM	Theater army area command
TAAMMC	Theater army area materiel management center
TAMMC	Theater army materiel management center
TAMMIS	Theater Army Medical Materiel Information System
TCAC	Technical control and analysis center
TDA	Table of distribution and allowances
THMT	Tactical High Mobility Terminal
TMDE	Test, measurement, and diagnostic equipment
TOE	Table of organization and equipment
TPS	Test program set
TRADOC	Training and Doctrine Command
TRISA	TROJAN Intermediate Support Activity
UAV	Unmanned aerial vehicle
USAIC	U.S. Army Intelligence Center
USAISD	U.S. Army Intelligence School Devens
USAREUR	U.S. Army Europe
USASOC	U.S. Army Special Operations Command
VCSA	Vice Chief of Staff of the Army
VHFS	Vint Hill Farms Station, Warrenton, VA
VME	Versatile module - Europe
"X"RA	EAC integrated repair activity