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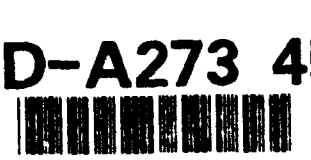

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INTELLIGENCE AND ELECTRONIC WARFARE (IEW) STREAMLINING PROJECT

Volume III
Reference Documentation (Part 4)
September 1, 1992

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13. ABSTRACT (Maximum 200 words)

Purpose of study was to recommend improvements in logistics support for Army intelligence and electronic warfare (IEW) equipment. Report analyzes existing sustainment system and recommends a number of systemic improvements to integrate and streamline the sustainment of IEW materiel. The recommended objective concept includes centralized control of regional sustainment assets (including contracts providing sustainment) under Army Materiel Command; organizational changes to integrate soldier, civilian, and contract resources; improved distribution and control of spares; improved deployment capability; and provisions to enhance technology transfer between contractors, civilians, and soldiers.

The IEW Streamlining Study Sustainment Analysis Report consists of four volumes, some multipart. Volume IV, which is classified, may be obtained from the Defense Technical Information Center, Cameron Station, Bldg. 5, ATTN: Acquisition-OCP, Alexandria, VA 22304-6145. Study documents are as follows:

- Volume I, Sustainment Analysis Report, revised 30 Oct 92
- Volume II, Directives and Related Study Documents, revised 18 Nov 92
- Volume III, Reference Documentation (Part 1), 1 Sep 92
- Volume III, Reference Documentation (Part 2), 1 Sep 92
- Volume III, Reference Documentation (Part 3), 1 Sep 92
- Volume III, Reference Documentation (Part 4), 1 Sep 92
- Volume III, Reference Documentation (Part 5), 18 Nov 92
- Volume IV, Systems Sustainment (Part 1)(classified), 1 Sep 92
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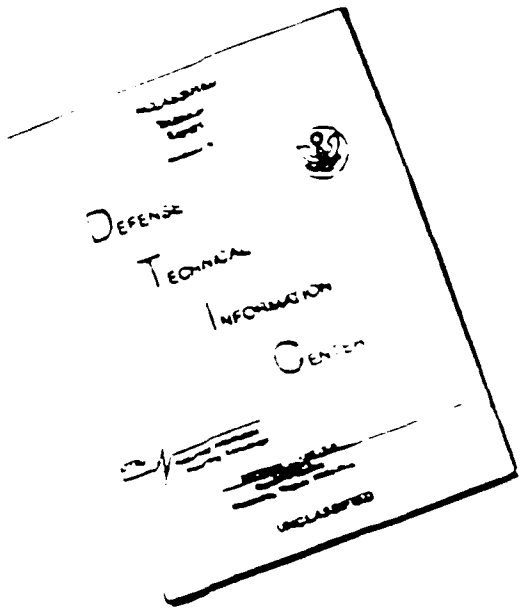

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IEW STREAMLINING PROJECT

Volume III

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September 1, 1992

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UNCLAS
SIGNED JAMES M. SKURKA, DIR, C3I LOGISTICS AND READINESS CENTER
SUBJ: INTELLIGENCE ELECTRONIC WARFARE (IEW) EQUIPMENT MAINTENANCE
1. OVER THE LAST SEVERAL YEARS WE AT CECOM HAVE BEEN TAKING ACTION TO IMPROVE THE READINESS AND SUSTAINABILITY OF IEW SYSTEMS. ONE OF THE THINGS WE HAVE FOUND IS SOME TASKS THAT DIRECT SUPPORT (DS) CA DO WHICH ARE NOT CODED THAT WAY. WE ARE IN THE PROCESS OF REVIEWI DOCUMENTATION AND PUBLISHING CHANGES. IN THE MEANTIME, WE BELIEVE THAT AUTHORIZATION TO DO TASKS AT THE LOWEST LEVEL WILL IMPROVE READINESS AND LOWER TRANSPORTATION COSTS AND TIME CONSUMED. THE RESULTS OF A RECENT TEST AT FORT CAMPBELL, KY INDICATE THAT THE MOS HAS THE ABILITY TO PERFORM SOME OF THE GENERAL SUPPORT (GS) LEVEL TASKS. WE WANT TO CHANGE SOME TASK LEVELS.
2. PRELIMINARY REVIEWS OF MAINTENANCE ALLOCATION CHARTS INDICATE A NUMBER OF MAINTENANCE FUNCTIONS NOW CODED AS GS WHICH COULD BE PERFORMED BY DS REPAIR PERSONNEL ORGANIC TO THE MI BATTALION WITHOUT THE NEED FOR ADDITIONAL TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE). OTHER TASKS WOULD REQUIRE ADDITIONAL TMDE. REVISED MAINTENANCE ALLOCATION CHARTS WOULD NEED TO BE PUBLISHED TO PERMIT DS REPAIR SECTIONS TO REQUISITION GS LEVEL REPAIR PARTS.
3. EFFECTIVE IMMEDIATELY, HOLDERS OF TACTICAL IEW EQUIPMENT (AN/TRQ-32 (V), AN/TLQ-17A, AN/ALQ-151 (V), AN/MLQ-34, AN/MSQ-103B/C, AN/TSQ-138* AND AN/PRD-10) ARE AUTHORIZED TO PERFORM GS MAINTENANCE ON THE MISSION-UNIQUE ELECTRONIC COMPONENTS OF THESE SYSTEMS CONSISTENT WITH THE CAPABILITY OF THE UNIT. NON-MISSION COMPONENTS ARE NOT INCLUDED IN THIS CHANGE. DS AND GS MISSION-UNIQUE TASKS BEYOND THE CAPABILITY OF THE ORGANIC DS REPAIR SECTION WILL CONTINUE TO BE EVACUATED TO THE SPECIAL REPAIR ACTIVITY AT CORPS AND THEATER/GS. IN ORDER TO ADEQUATELY IMPLEMENT THIS CHANGE, EACH MI BAYTALION COMMANDER SHOULD ASSESS HIS ABILITY TO PERFORM GS LEVEL TASKS AND INFORM MY POC'S OF THOSE TASKS AND ADDITIONAL TMDE, PUBLICATIONS, REPAIR PARTS, AND TRAINING REQUIRED, SUCH THAT WE MAY EVALUATE THE INDIVIDUAL MAINTENANCE TASK MOVEMENT. ITEMS UNDER WARRANTY OR SUPPORT BY OTHER SERVICES SHOULD REMAIN IN THE CURRENT MAINTENANCE SCHEME AS DEFINED IN THE CURRENT MAINTENANCE ALLOCATION CHART. THE PERFORMANCE OF ANY TASKS MOVED FROM GS TO DS MUST TAKE INTO ACCOUNT THE SAFETY OF PERSONNEL AND THE PERFORMANCE CAPABILITY OF THE SYSTEM IN THE FUTURE.
4. MY POC'S IN THIS REGARD ARE MR. RALPH RIDDLE, USACEA-VH (SELCE-SM), AUTOVON 229-5051, AND MR. GEORGE SCHUH, HQ CECOM (AMSEL-LC-ME-EW), AUTOVON 992-1685.
5. CECOM BOTTOM LINE: THE SOLDIER.

Appendix U

2d Support Center (MMC) Memo, 22 Mar 92, Subj: Reparable Management Procedures

DEPARTMENT OF THE ARMY
2D SUPPORT CENTER (MMC)
FORT BRAGG, NORTH CAROLINA 28307-5000

AFVH-MM-RO 22 MAR 92

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Reparable Management Procedures

1. Optimizing the management of reparables will be the singularly most important event in the execution of this and future years budget. To achieve the maximum benefit from this program we must work together and communicate effectively.

2. The COSCOM is the work loader and leader for the management of reparables in the XVIII Abn Corps. The 2d MMC has the lead for the establishment of policies and systems to optimize our reparable program in the Corps.

3. Based on comments provided to the 11 Feb 92 Draft procedures the following procedures are effective 1 April 92. Comments or changes to improve the cost effective operation of the program are welcome.

4. POC for this information is LTC Woodward, 396-1915/7290.

Encl AS

JOHN P. WOODWARD
LTC, AVN
Chief Readiness Operations

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ATVII MM RO 22 MAR 92

REPARABLE MANAGEMENT PROCEDURES

1. Purpose. To establish the policies and procedures for the management of reparables.

2. Applicability. All units assigned or attached to XVIII Airborne Corps at FT Bragg and or requisitioning supplies through the SARSS-O system.

3. Responsibilities. Two separate storage activities for reparables are maintained to support the FT Bragg installation and XVIII Abn Corps. The DOL supports through the installation supply support division (ISSD) units which are not supported by units of the XVIII Abn Corps (1st COSCOM and 82nd Abn Div). The 1st COSCOM through the Forward Reserve Theater Storage Activity (FRTSA) supports the XVIII Abn Corps. The XVIII Abn Corps through the 1st COSCOM, 2d Materiel Management Center manages the XVIII Abn Corps reparable program and workloads the repair activities with the corps unserviceables. Stockage authorization in the ISSD and FRTSA sites is based on the requirements generated from their supported customers.

4. General Information.

a. Reparables are secondary items (not major end items) identified as having a Maintenance Repair Code (MRC) of O, F, H, D, or L and/or an Automatic Return Item Code (ARI) of C, E, or S.

b. Procurement Army (PA) funded secondary items transition to the Army Stock Fund (ASF) on 1 April 92. The intent of this transition is to place the burden of financial responsibility for these high dollar items on the requisitioner. To control the impact of increased costs, an installation wide effort is required to more effectively manage the repair of these items. This effort has concentrated on expanding and improving the local repair capability to increase the installation's productivity and therefore reduce the cost of replacing these high dollar items. Key to this effort is control and accountability of the flow of these reparables.

c. The following procedures apply to the flow of reparables in the logistics system. The intent is to minimize/eliminate the flow of reparables through maintenance channels and maximize the availability and flow of reparables through the supply channels. At the time of publication, the supply system generates a full cost plus partial credit transaction which inappropriately charges units wholesale prices for locally more economically repaired items. To compensate for this, local procedures are being established to apply the appropriate costs to the unit.

AFVH-MM-RO 22 MAR 92

5. Supply Procedures

a. Customers turn-in unserviceable reparables to their supporting Supply Support Activity (SSA) and request a serviceable replacement.

b. SSAs receive, store, and issue these assets. The SSA job orders unserviceable assets (within two working days) to a maintenance unit/activity for repair and return to stock or evacuation if nonreparable to the next higher SSA.

(1) Direct Support units set their SSA maintenance referral switch to "F".

(2) General Support (249th common and AIMI and 406th) set their maintenance referral switch to "L". 249th Avn remains at "O".

(3) AVIM units set their maintenance referal switch to "L".

(4) Materiel dispositioned to Defense Reutilization Marketing Office (DRMO) or to wholesale will be inspected by a qualified inspector at the level of maintenance designated by the items recoverability code prior to evacuation from the COSCOMs accounts.

c. Controlled Cryptographic Items (CCI) will be controlled and clearly annotated IAW pertinent regulations. Communication Security reparables will be evacuated and controlled through COMSEC channels.

d. Stockage levels will be computed IAW AR 710-2 and command directives.

e. Customer/SSA "AO" requests must proceed unserviceable turn-in transactions to preclude the dispositioning of unserviceables off post.

f. Unserviceability of an item caused by other-than-fair-wear-and-tear (FWT) requires the unit commanders certification IAW AR 735-5.

g. Materiel in excess of the RO for a reparable line is excess and will be dispositioned off post or laterally referred through the automated process.

h. Supply Support Activities reconcile maintenance due-in files at a minimum monthly. Irregularities are cleared through normal IAR procedures. Units ensure internal controls are in place to prevent loss of high dollar reparables, especially in the accountability of unservicables referred to maintenance.

6. Maintenance Procedures.

a. The maintenance activity and corresponding SSA jointly select repair items based on demand history, command directed additions and maintenance capability. Reparables may be selected for repair under the following conditions:

(1) If they are authorized for removal or replacement at the corresponding maintenance level performing the maintenance or lower.

(2) Have the appropriate tools, test equipment, facilities, and trained personnel to perform the required maintenance IAW technical manuals.

(3) Have approval from higher for repairs above their maintenance level.

b. Maintenance units may accept reparables for work order on an exception basis when:

(1) The item being work ordered is a matched component to the assembly it was removed from and the items exchange through supply channels would require extensive adjustments to rematch the component to the assembly it was removed from.

(2) When the supporting SSA does not have a like item for issue, because:

(a) The SSAs PO is zero or there are no serviceable assets on hand or available through the local referral process.

(b) The end item requiring the reparable will become fully mission capable with the return of the reparable and all materiel is on hand to repair the reparable;

(c) The time to repair the item will not exceed the order to receipt time for the new reparable from wholesale.

c. There is no change in policy for the job ordering of major end items. DSUs will continue to accept end item job orders and evac the same to the next higher maintenance level as required. Reparables will not be job ordered from the DSU to the next higher level for repair. Rather they will be turned into the DSUs' supporting SSA for evacuation through the supply system to the next level as required.

d. Aviation maintenance procedures comply with the above procedures with the following additions:

(1) As a general rule all reparables are workordered for repair prior to requesting a replacement through a supply transaction. All reparables are subject to the two person rule. This requires two personnel to certify an item is not locally repairable prior to submitting a requisition. RMC of U and Z are tagged at the AVUM level. All other (F, H, D, L) are turned in to the supporting AVIM on 5504 for TI and repair and return as required.

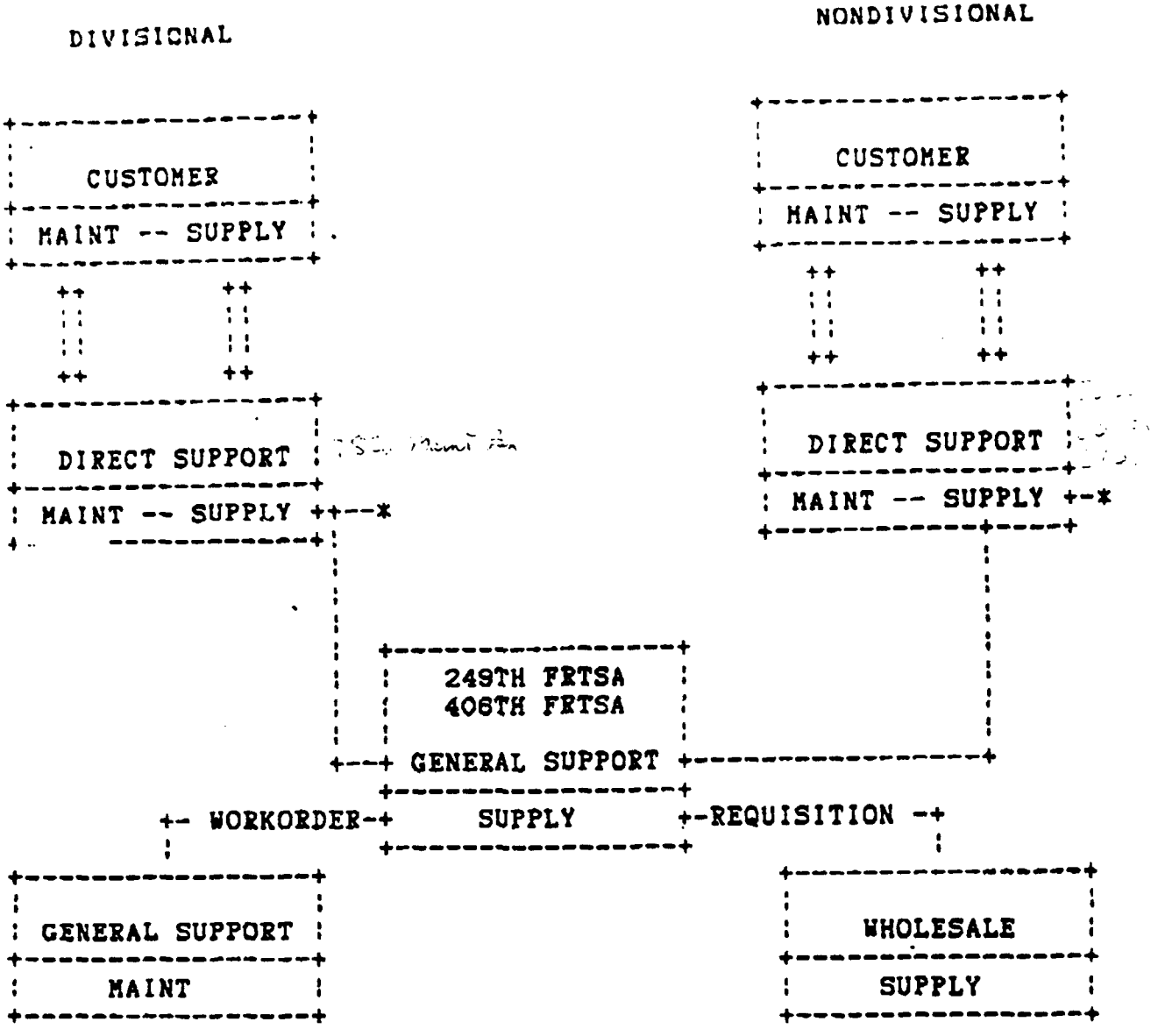
(2) Major assemblies not reparable at the unit level requires AVIM approval prior to removal of the assembly. This procedure is required to ensure AVIM/MMD maintenance personnel can evaluate the potential for local repair prior to removal from the airframe.

(3) Phase maintenance is performed at the lowest level possible to ensure AVIM/MMD can focus on component/reparable repair.

(4) D co 82nd ABN, workorders to I Co 159th. (Encl 2)

7. POC for this information is LTC Woodward, Chief Readiness Operations, 2d MMC, 396-1915.

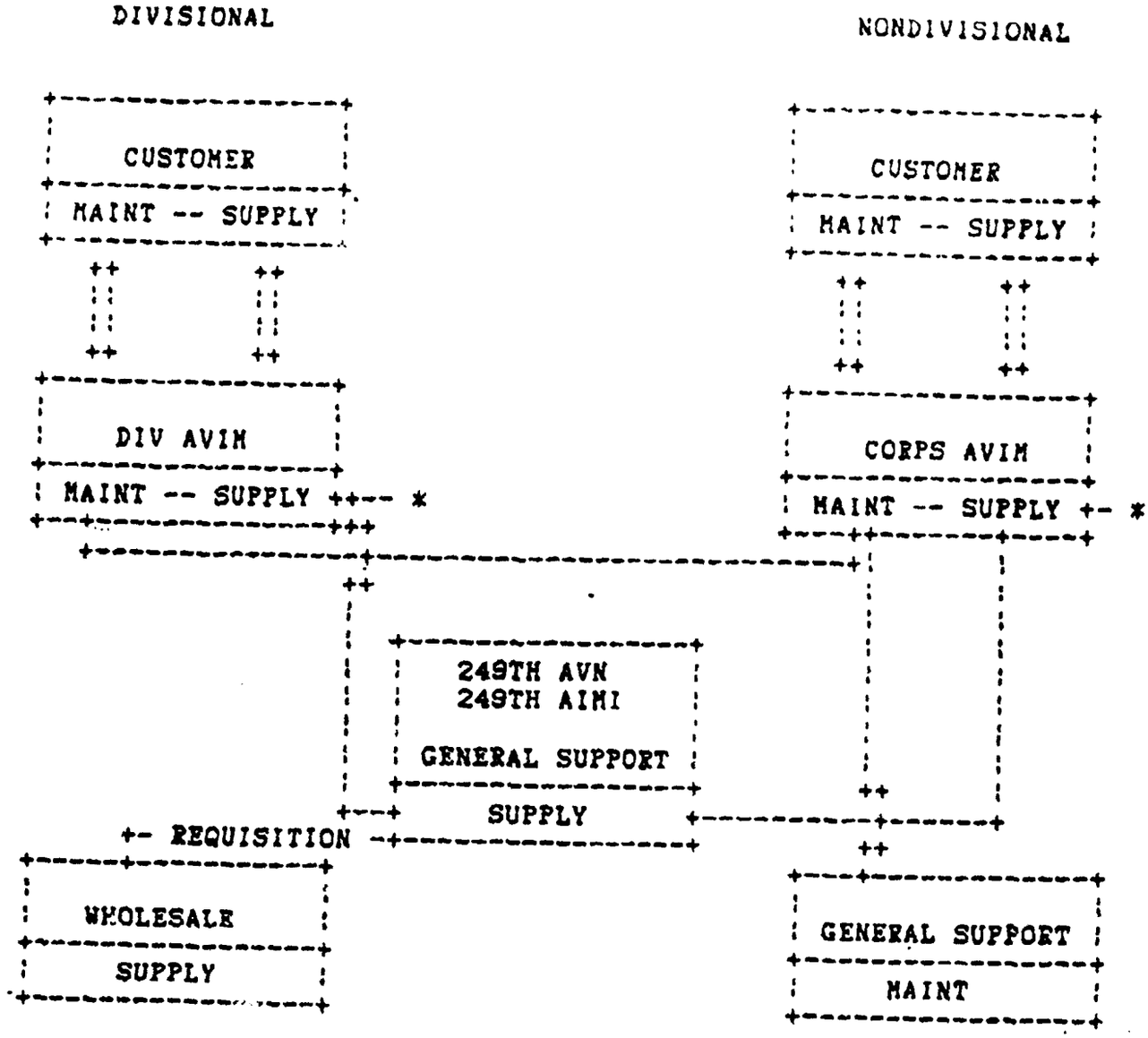
GROUND
MATERIEL FLOW



* Requisitions process to wholesale from the SSA when stock is not available IAW referral procedures.

ENCL 1

AIR
MATERIEL FLOW



* Requisitions process to wholesale from the SSA when stock is not available IAW referral procedures.

ENCL 2

Appendix V

FORSCOM Memo, 24 Mar 92, Subj: IEW Streamlining Study

DEPARTMENT OF THE ARMY
HEADQUARTERS FORCES COMMAND
FORT MCPHERSON, GEORGIA 30330-6000

REPLY TO ATTENTION OF

FCJ4-SME (700)

24 March 1992

MEMORANDUM FOR Secretariat, Intelligence and Electronic Warfare (IEW) Study Team, CIMMC ATTN: SELIM-IEW, Vint Hill Farms, Warrenton, VA 22186-5277

SUBJECT: IEW Streamlining Study

1. This memorandum provides draft information on 14 IEW systems as indicated at enclosure 1. Enclosure 2 contains available flow chart data in support of these systems.

2. Recommend, as a minimum, that the following documents be reviewed for additional information as it pertains to support and performance of IEW systems in SWA:

a. PM SW IEW Post-War Working Group Meeting Minutes and After Action Report, 23-25 July, 1991.

b. CECOM (AMSEL-RD-EW-SE) (CONFIDENTIAL) report: Desert Storm IEW Lessons Learned, dated 28 June, 1991 with CECOM Center for EW/RSTA (CONFIDENTIAL) report: AMC Weapons System Combat Performance Assessment Team, Intelligence and Electronic Warfare Findings, dated 10 May, 1991

c. Battlefield Proficiency Assessment Questionnaires for IEW Systems, dated 5 April 1991, that were prepared for USACIMMC by the COBRO Corporation and distributed in SWA.

3. As noted in CECOM report (paragraph 2.b. above) these reports are "only a partial look at the lessons learned and that AMC is still integrating assembling all inputs". Recommend all data on the use and support of IEW systems be collected, reviewed, and included in the IEW Streamlining Study final report.

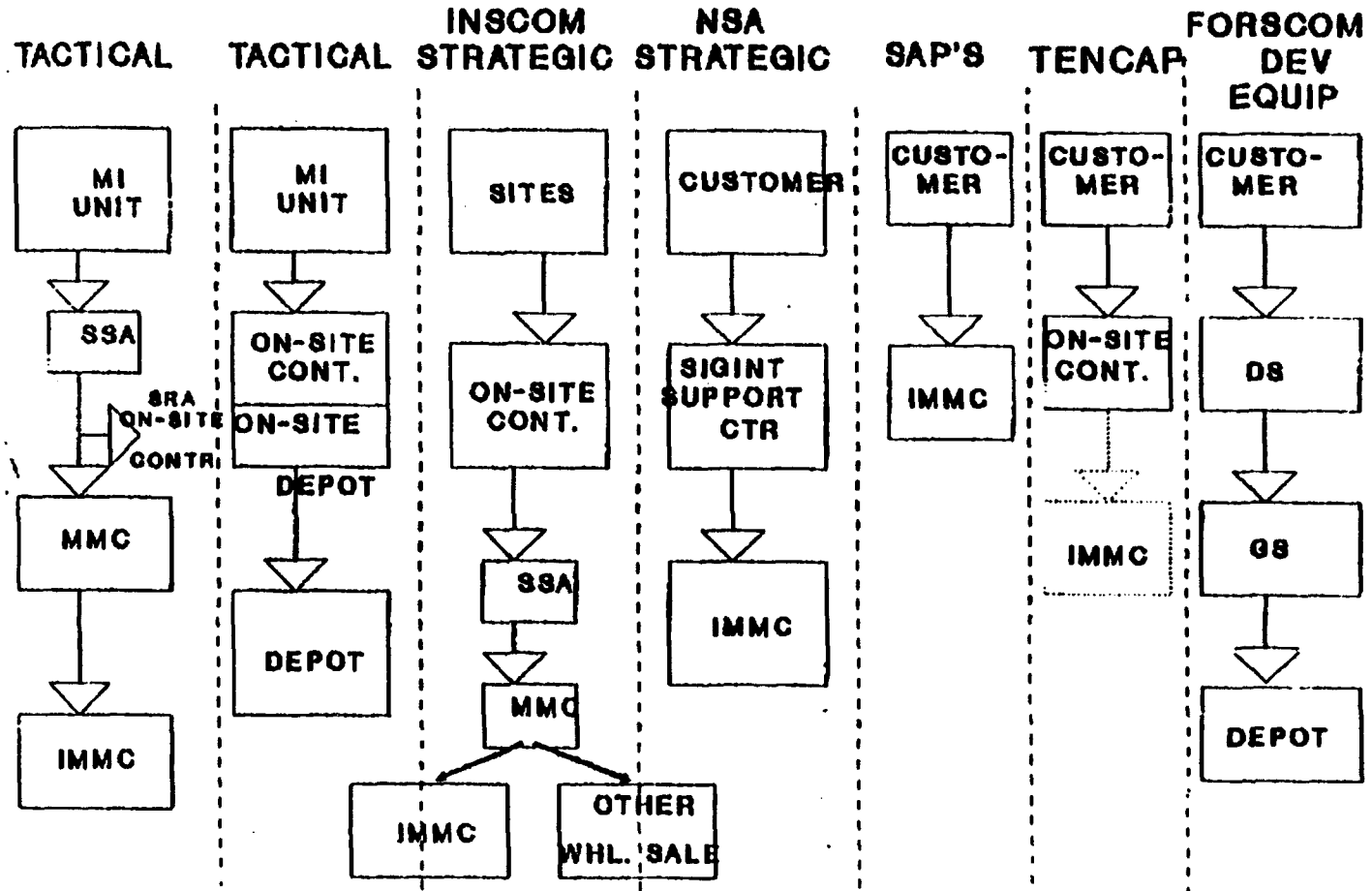
4. For additional information please contact FORSCOM J4 IEW Study Team, Mr. Serrentino, FCJ4-SMM, DSN 367-7284, or Mr. Blackmon, FCJ4-SME, DSN 367-7204, FAX DSN 367-6076 or (404) 669-6076.

RICHARD E. SERRENTINO
Chief, Maintenance Division

2 Encls
Designated Equipment list
System Support Flow Charts

ENCL 2 -A

MULTIPLE INTELLIGENCE SUPPORT SYSTEMS



- TACJAM
- TEAMMATE
- TEAMPACK
- TRAFFICJAM
- QUICKFIX
- TRAILBLAZER

- GUARDRAIL
- QUICKLOOK
- ASAS
- IGR V
- GRCS

- ASTW-AT
- HANDLOCK
- WRISTLOCK
- WAXMAN

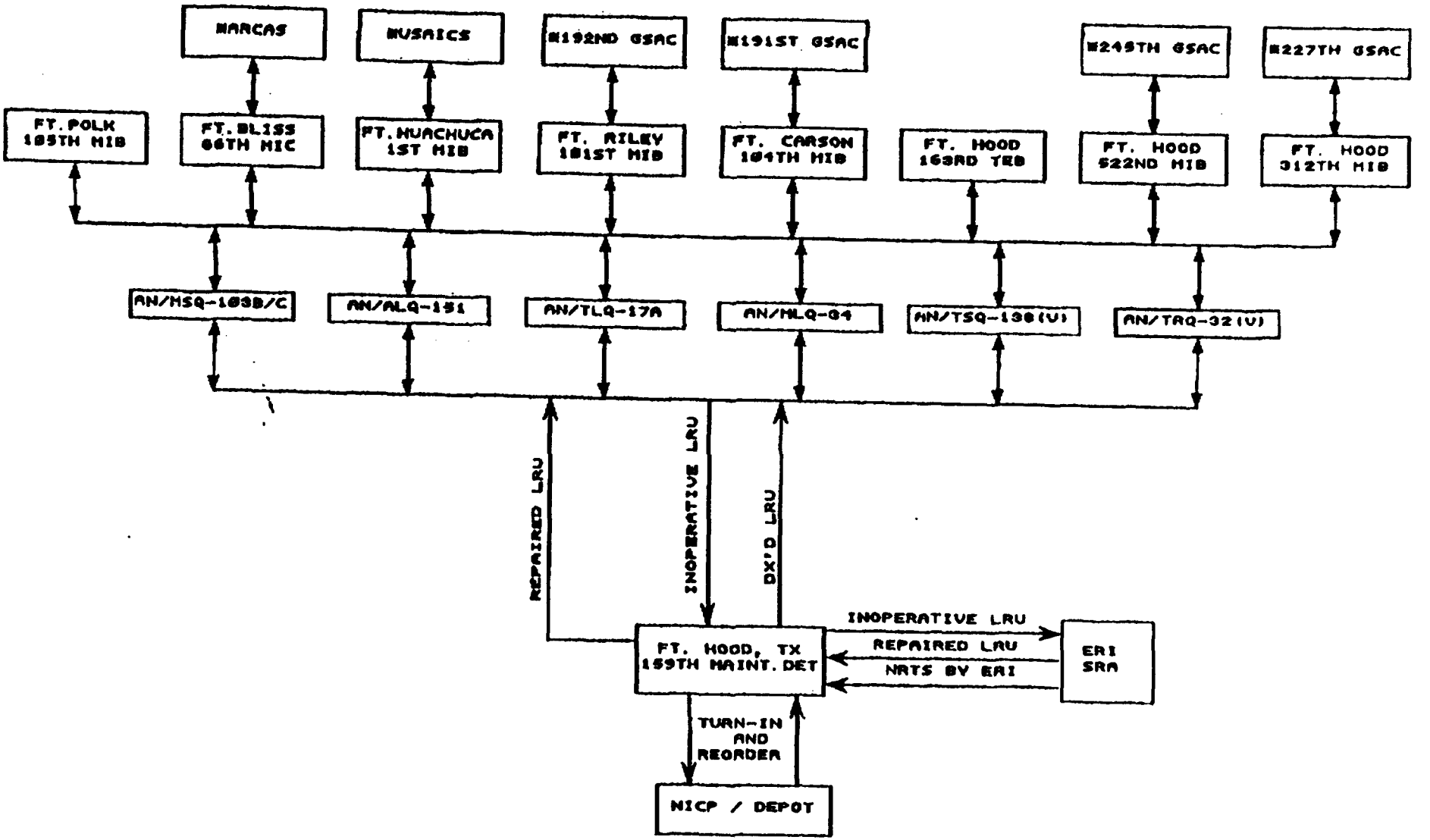
- ASTW XT
- NEWSPAPER
- CV3611
- TD1220
- HOMESTER
- ACONITE

- IPDS
- EPDS
- TRAC

- MICROFIX
- RACJAM
- FAISS
- Goldwing V1, V2
- TACFIX
- MINIFIX
- DRAGONFIX
- HACJ

91184-10

IEW LRU FLOW



E SIGNIFIES AVIATION UNITS

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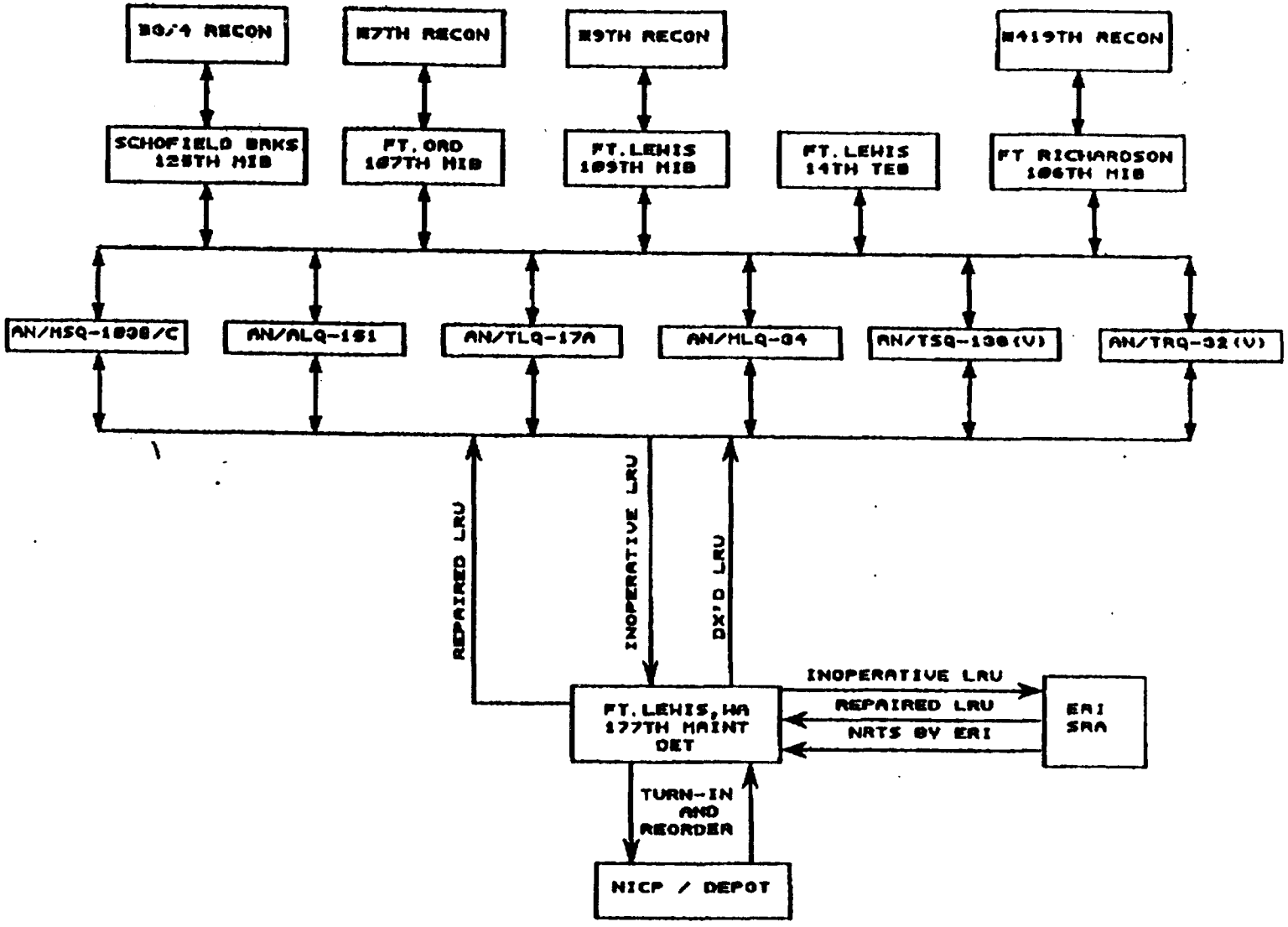
IEW LRU FLOW



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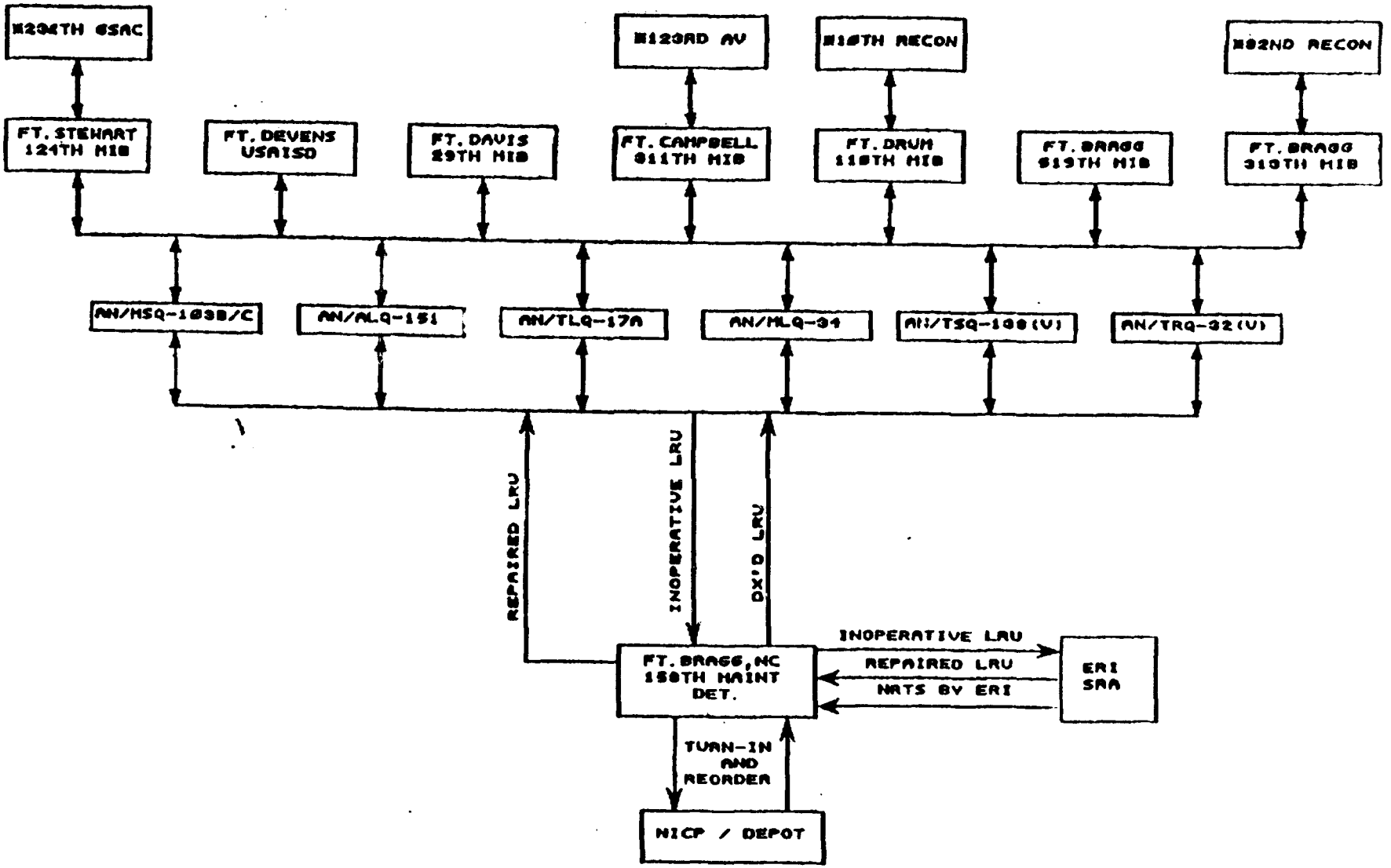
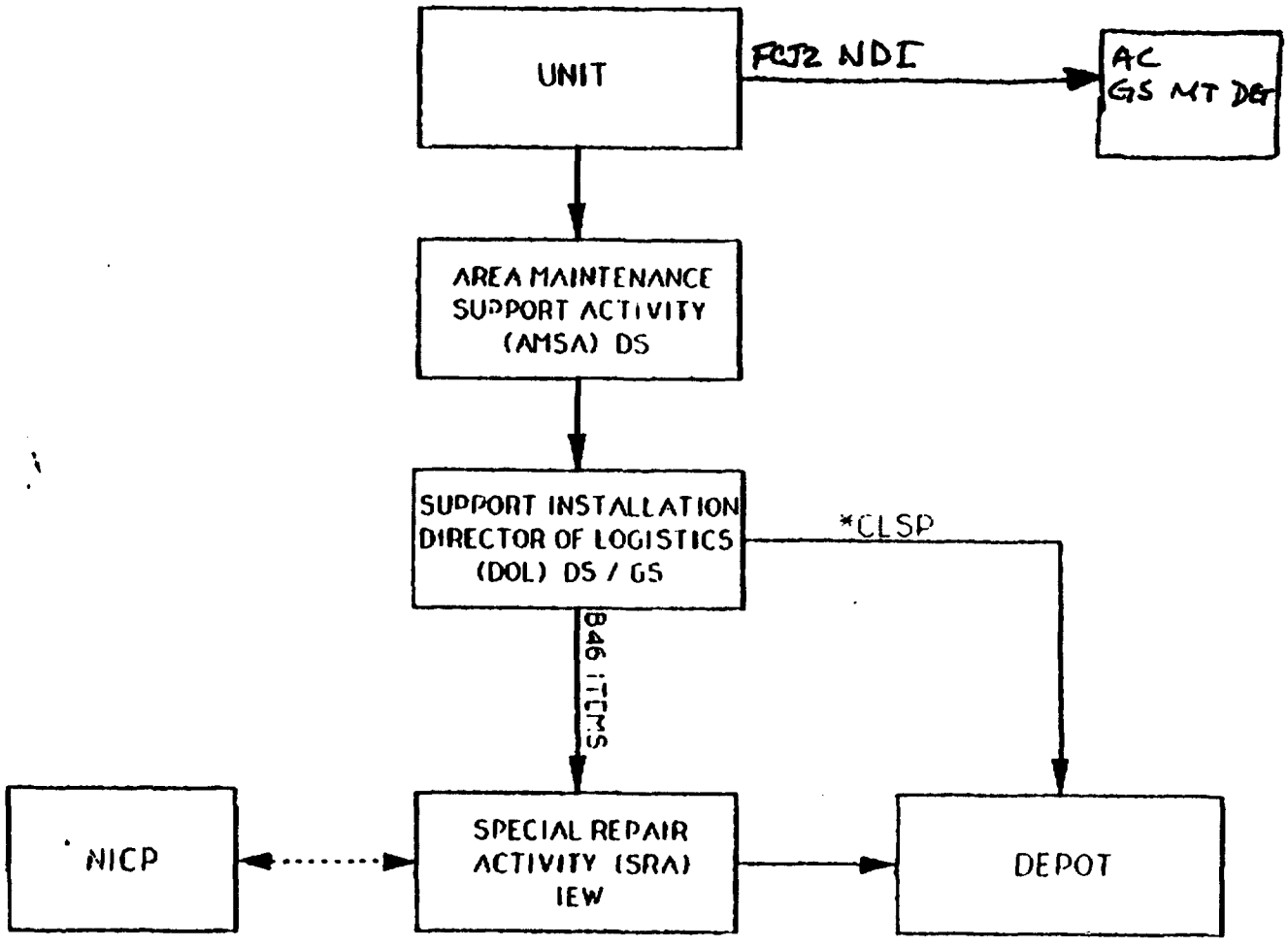


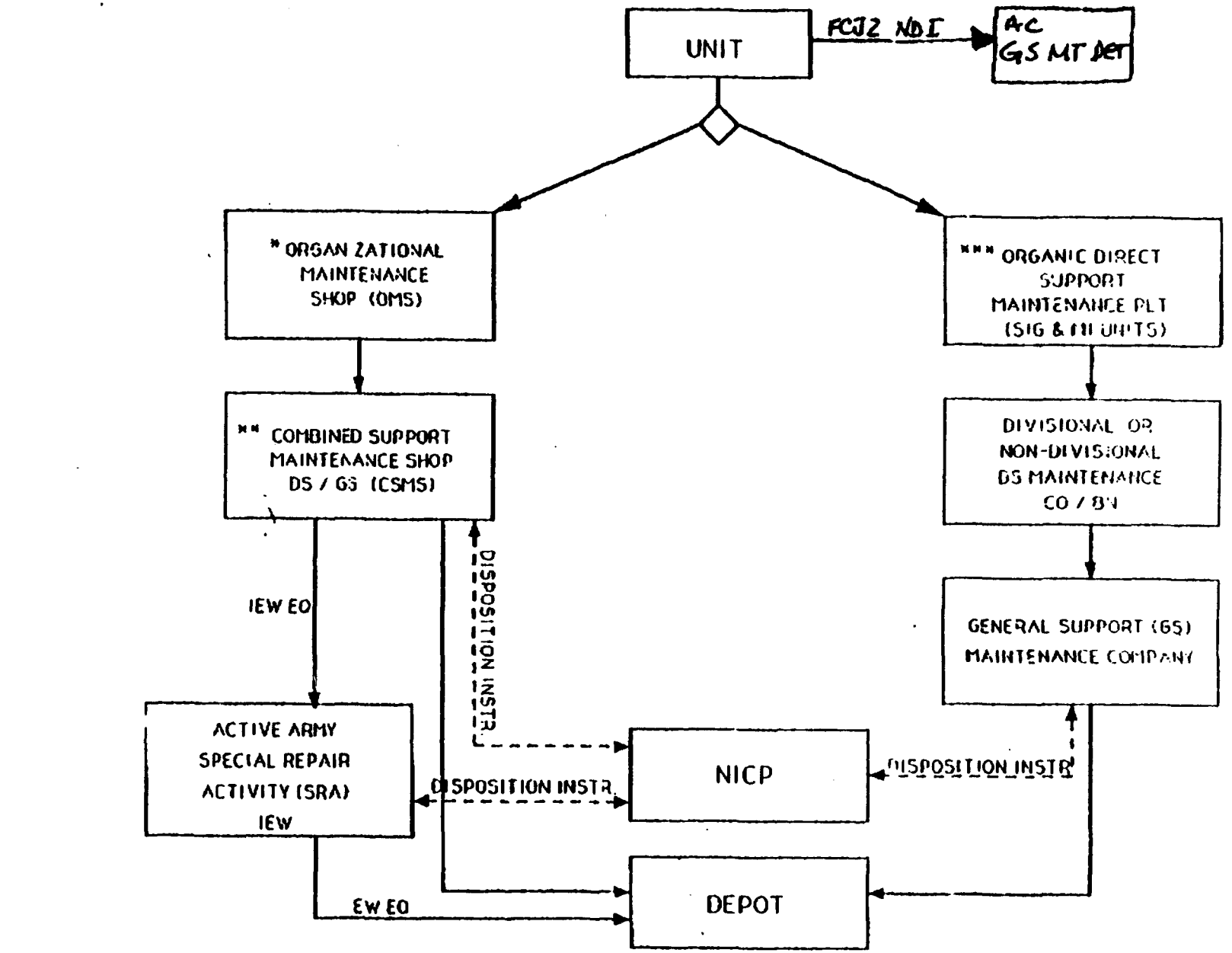
■ SIGNIFIES AVIATION UNITS

U. S. ARMY RESERVE PEACETIME MAINTENANCE FLOW



* "CLSP" COORDINATED LOGISTICS SUPPORT PROGRAM, B16 ITEMS WITH FIAC OF GA THRU GP

ARMY NATIONAL GUARD (ARNG) PEACE TIME MAINTENANCE FLOW



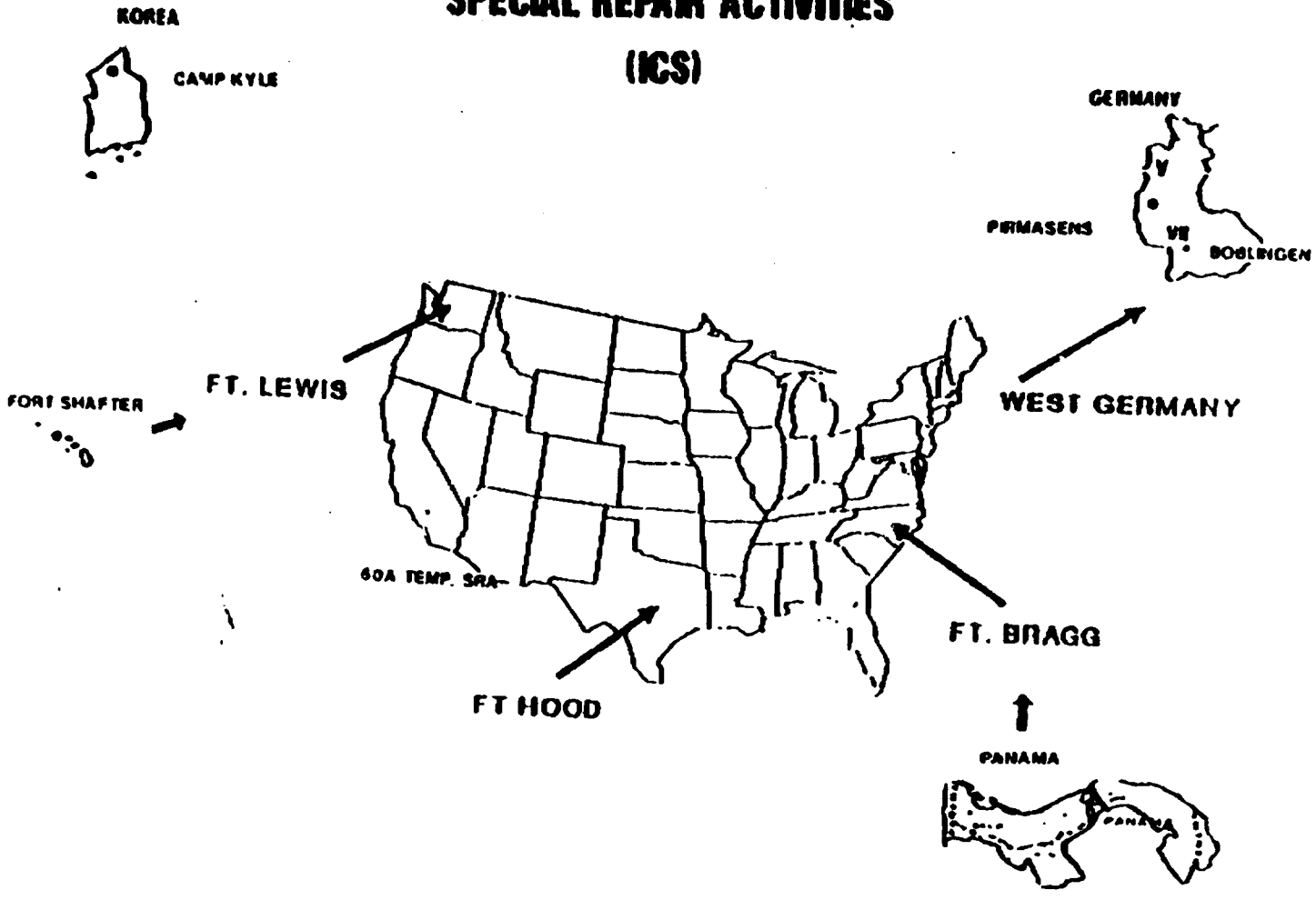
* EACH COMPANY / DETACHMENT S ZED UNIT IS ASSIGNED TO AN 'OMS' AN 'OMS IS MANNED FULLTIME

** MANNED FULLTIME AT STATE LEVEL

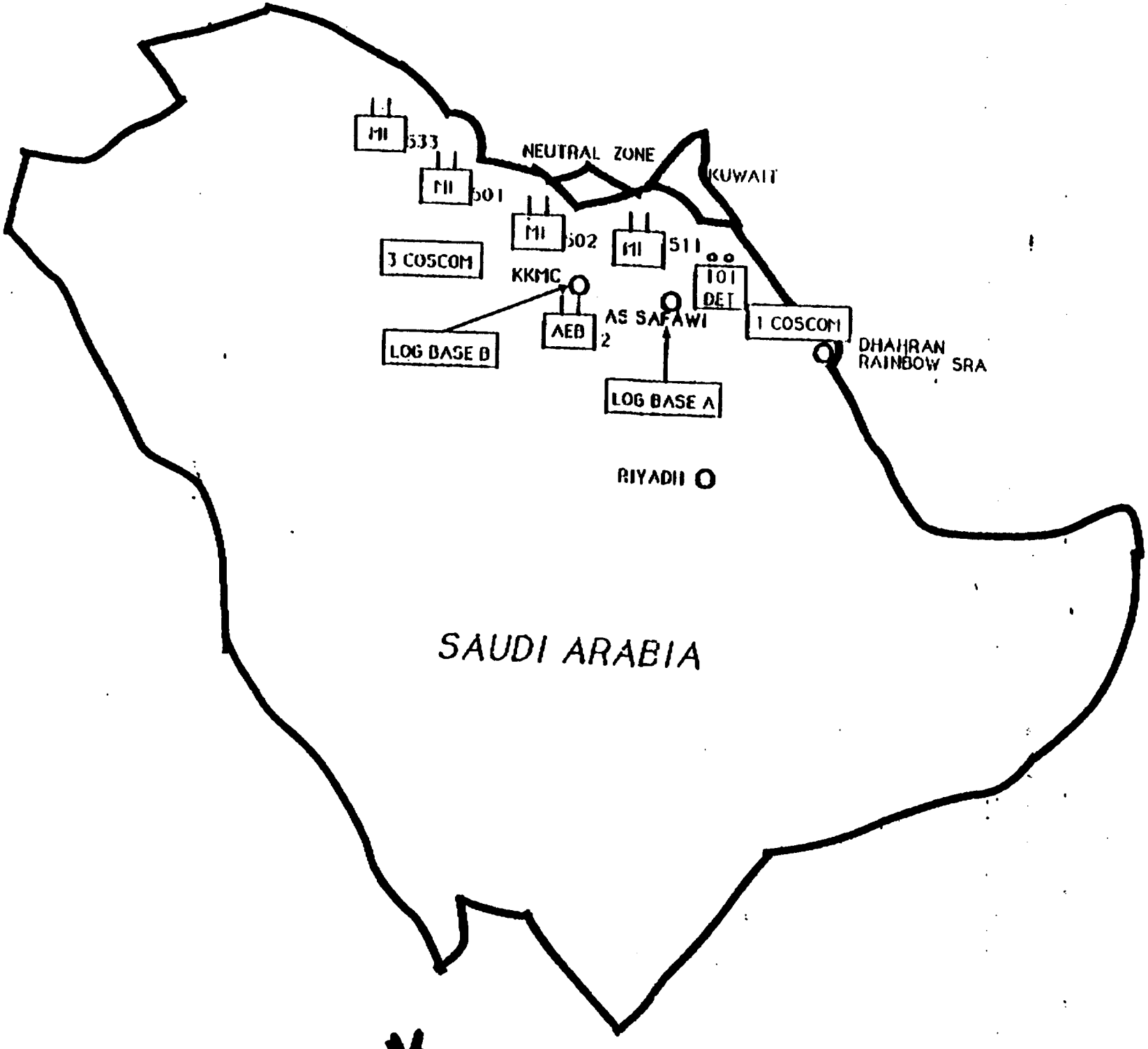
*** DEPENDENT UPON ABILITY TO COMPLETE JOB DURING DRILL PERIOD

SPECIAL REPAIR ACTIVITIES

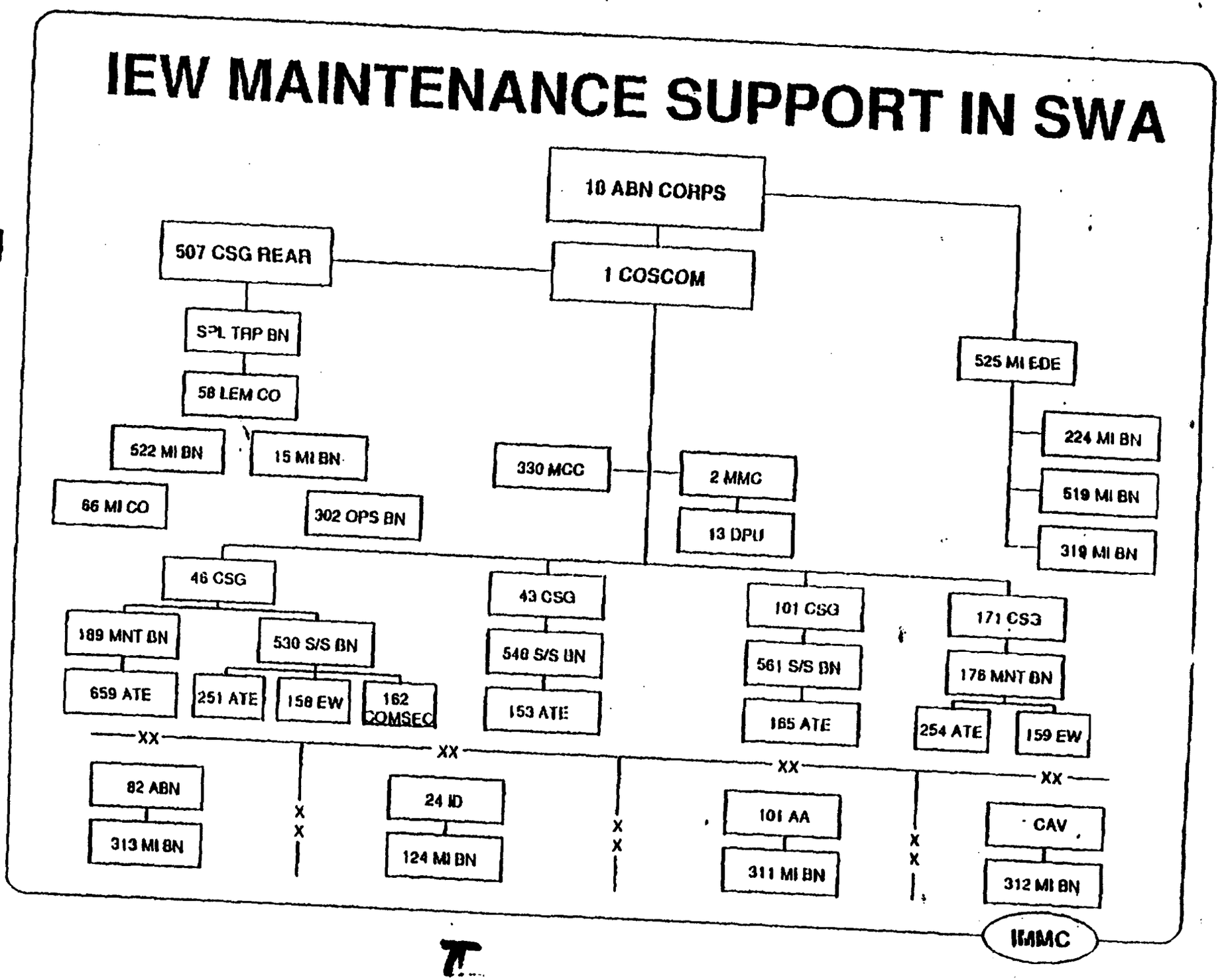
(ICS)



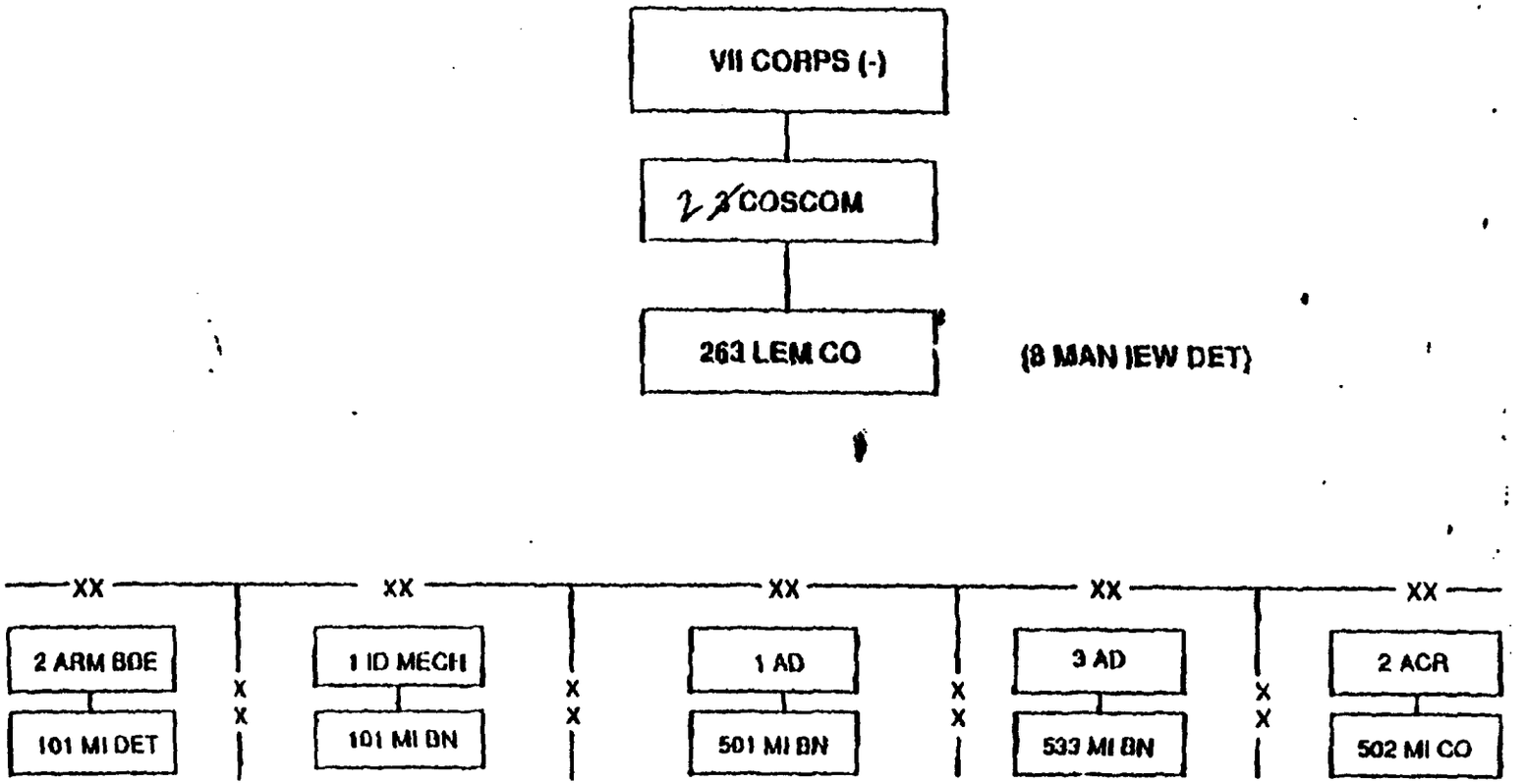
US ARMY COMMUNICATIONS
ELECTRONICS ACTIVITY - VINT HILL


MI
533
MI
501
NEUTRAL ZONE
KUWAIT
MI
502
MI
511
3 COSCOM
KKMC
101
DET
AEB
2
AS SAFAWI
1 COSCOM
DHAHRAN
RAINBOW SRA
LOG BASE B
LOG BASE A
RIYADH
SAUDI ARABIA

IEW MAINTENANCE SUPPORT IN SWA



IEW MAINTENANCE SUPPORT IN SWA



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Appendix W

CIMMC MFR, 10 Jun 92, Subj: Force Structure: TAA01 and GS Maintenance Support

SELIM-IEW

10 JUN 1992

MEMORANDUM FOR RECORD

SUBJECT: Force Structure: TAA01 and GS Maintenance Support

1. Reference:

a. Phone conversation between Mr. Dutton, USACIMMC, and Mr. Serrentino, USAFORSCOM, 3 Jun 92, SAB.

b. Phone conversation between Mr. Dutton, USACIMMC, and Mr. Herbert Davis, TRADOC Ordinance Center and School, 5 Jun 92, SAB.

2. As a follow-up to the 27-29 May 92, MACOM Level IPR, Mr. Serrentino discussed concern with the upcoming Total Army Analysis (TAA) 01 scheduled for 23-25 June at HQDA. During this TAA process the panel would be considering General Support (GS) force structure requirements.

3. Mr. Serrentino provided the following information:

a. The proposal for future GS support would convert current IEW GS Detachments (DETs) to COMSEC/IEW Equipment Repair Platoons (TOE 43549LJOO).

b. Mr. Serrentino understood the FORSCOM GS Co requirement to be 8 Co's with 3 Co's having an IEW repair mission with the appropriate COMSEC/IEW repair platoon. However, the results of the TAA01 process was expected to yield 6 GS Co's (75% of expressed requirements) with a single COMSEC/IEW repair platoon (33% of expressed requirement).

c. Mr. Serrentino expressed deep concern with this potential loss of IEW GS organic capability and solicited our help in attempting to push concern into the TAA01 process.

4. A later discussion with Mr. Davis, TRADOC Ordinance Center and School, confirmed a possibility of such a force cut resulting from TAA01; however, the bulk of the discussion focused on establishment of past IEW GS force structure decisions. Prior to TAA96, the IEW GS structure recognized four (4) Active Component (AC) and one (1) Reserve Component (RC) element (AC - Ft. Lewis, Ft. Hood, Ft. Bragg, Davis: RC - W/NGB, location not defined). TAA99 reduced the structure from 4 to 2 AC elements (with two (2) deactivations during FY93). The 2 GS units would be in FORSCOM with no location specified. Synopsis of additional information discussed follows:

a. TAA99 reduced FORSCOM GS Co to a number of seven (7).

SELIM-IEW
SUBJECT: Force Structure: TAA01 and GS Maintenance Support

b. The LJ series TOE is scheduled for the Consolidated Table Update (CTU) approval this month by HQDA.

c. The 29 TOE 630 and 640 series will be removed from the Structure and Manpower Allocation System (SAMAS) files at HQDA during FY93.

d. Requirements for GS forces are workload driven with IEW based on Workload 39 of the Force Analysis Simulation of Theater Administrative and Logistic Support (FASTALS) process, performed by the Concepts Analysis Agency, Bethesda, MD (Field Activity of HQDA).

e. Workload 39 applies MARC data for 29S and 33T MOS maintenance field GS workload.

f. Korea and Europe have not supported IEW GS requirements as they trade-off limited resources to Host Nation (HN) or contract support.

g. Mr. Davis sees GS going contract in near future (NOTE: This feeling is related to AMC/SLA support concepts being developed).

5. Mr. Davis stated the best HQDA source to be Pam Bockman, DA DCSOPS. Future contact with Ms. Bockman will be made by the undersigned.

6. CECOM Bottom Line: The Soldier.

DENNIS DUTTON
Project Officer IEW
Sustainment Study Group

CF:
SELIM-P
SELIM-DIR
SELIM-T
FORSCOM, ATTN: FCJ4-SMD
BDM, INT

Appendix X

BDM International MFR, 18 Jun 92, Subj: Force Structure: TAA01 and GS Maintenance Support

BDM International June 18, 1992

MEMORANDUM FOR RECORD

SUBJECT: Force Structure: TAA01 and GS Maintenance Support

1. Reference:

a. Phone conversation between Mr. Dennis Dutton, United States Army Communications and Electronics Command (CECOM) Intelligence Materiel Management Center (USACIMMC), Vint Hill Farms Station, Warrenton, Virginia, DSN 229 Civ (703) 349-6340/5047 and Mr. Dave Nicholas, BDM International, Inc, Newport News, Virginia, (804) 596-6843, June 2, 1992, SAB.

b. Phone conversation between Mr. Dom Vittorini, Chief, Organizations Branch, Policy and Management Division (ATCD-ET), Systems Priority Integration Directorate, Office of the Deputy Chief of Staff for Concepts, Doctrine and Development, Headquarters, United States Army Training and Doctrine Command (TRADOC), Ft. Monroe, Virginia, DSN 680 Civ (804) 727-3539 and Mr. Robert Klebo, BDM, June 3, 1992, SAB.

c. Phone conversation between Mr. Quinn, Master Plan Division (ATSI-CD-M), Directorate of Combat Developments, United States Army Intelligence Center, Ft. Huachuca, Arizona, DSN 879 Civ (602) 538-2274/2275, and Mr. Klebo, June 3, 1992, SAB.

d. Phone conversation between Mr. Bill Rodden, ATSI-CD-M, (see para. 1.c. above) and Mr. Klebo, June 3, 1992, SAB.

e. Phone conversation between Mr. Roy Hodges, Combined Arms Command (ATZL-CDD-M), Ft. Leavenworth, Kansas, (913) 684-2018/4718 and Mr. Klebo, June 3, 1992, SAB.

f. Phone conversation between Mr. Jim Fritz, MARC, CECOM (AMSEL-LC-ME-MPD), Ft. Monmouth, New Jersey, (908) 532-4569, and Mr. Klebo, SAB, June 8, 1992, SAB.

g. Memorandum for Record, Mr. Dennis Dutton, SELIM-IEW, 10 June 1992, SAB.

2. Mr. Klebo is pursuing answers to questions and clarification of issues raised in ref 1.g.

3. During ref 1.b. Mr. Vittorini discussed the process of the Total Army Analysis to be held June 23-25 at Headquarters, Department of the Army (HQDA). He stated that heretofore two rules of allocation had been used: existence and workload. Existence allocation is the justification of a unit's existence based on existence of the unit it supported, i.e. one Intelligence and Electronic Warfare (IEW) General Support (GS) Detachment (Det) per U.S. Army Corps in FORSCOM, thus three.

Workload allocation is the justification of a unit's existence based on the workload required by the supported units. For example, suppose an IEW GS Det has ten 33T IEW Tactical Systems Repairers assigned, and 30 man-years of work are required within FORSCOM. Then three IEW GS Dets would be allocated to FORSCOM. Mr. Vittorini stated that the existence rule will no longer be used in TAA discussions; that the TAA was using a "zero based requirement." He suggested that Mr. Klebo contact Mr. Joe Mukelroy at Ft. Huachuca.

4. In ref 1.c. Mr. Quinn said that Mr. Mukelroy was on leave until June 30, but that he could take action on any of Mr. Klebo's questions. Mr. Quinn was unaware of the possible actions as related in para 3.b. of ref. 1.g. but that he was concerned and would find out the U.S. Intelligence School (USAIC)' position and return the information to Mr. Klebo. (No information has been returned to date.) Mr. Quinn referred Mr. Klebo to Mr. Rodden (ref 1.d.) to explain the process and status of the Manpower Authorization Criteria (MARC) study for MOS 33T.

5. Mr. Rodden said that there was no MARC study for 33T, that one was contemplated but never executed. Mr. Klebo asked how were the authorizations for 33T repairers determined. Mr. Rodden stated that normally the Army Maintenance Manpower Database AMMDB is queried by each system and the number of repairers is determined by the workload recorded there. In fact that is how the allocations for 29, 63, and 31 series MOSs is done for the Military Intelligence (MI) Battalion (Bn). However the data in the AMMDB for the 33T is invalid. He said that when the requirements for 33T are processed using the AMMDB data, the result is that only one 33T is required for an MI Bn. The reason the data is bad in the AMMDB is that the workload of the 33T has not been, and is not being documented. The authorization for 33Ts at organizational and direct support (DS) level units is done by Best Engineering Estimate (BEE) of the workload by system, or more usually, by rule of thumb: two 33T repairers per three end item systems. For example, the three AN/TRQ-32 TEAMMATEs in and MI Bn require two 33Ts in the MI Bn Communications-Electronics (C-E) Maintenance Section. 33R IEW Aviation Systems Repairer authorizations are determined by the BOIP/QQPRI as negotiated by the combat and materiel developers of the individual systems. Mr. Rodden referred Mr. Klebo to Mr. Roy Hodges at the Combined Arms Command (CAC) for further information.

6. Mr. Hodges is responsible for all IEW MOSs at his office. In ref 1.e. Mr. Hodges explained the normal process for the MARC study process. The MARC incorporates the engineering estimates from the QQPRI of each system, and the actual maintenance data provide by U.S. Communications Electronics Command (CECOM). This data is reviewed by a Subject Matter Expert (SME) panel for each system. The results are reported to CECOM and then provided to CASCOM who incorporates the data into the AMMDB. The MARC study is approved by the U.S. Army Forces Integration Support Activity

(USAFISA) at DCSOPS. Mr. Hodges referred Mr. Klebo to Mr. Jim Fritz in CECOM for further information. (Mr. Hodges has not talked to CECOM for over two years.)

7. Mr. Fritz is responsible for MARC study data at CECOM. In ref. 1.f. Mr. Fritz explained that he receives manpower data through the CMARC Program which is a contract with COBRO to collect maintenance data on IEW systems in the field. The data is collected on a three year cycle. After he receives the data from COBRO he puts it into the required MARC study Annex A format and submits it to the MARC Analysis Support Office (MASO), Mr. Robert Miller at CASCOM, Ft. Lee, VA ((804) 734-5301/1845, DSN 687-5301). The report is provide to Mr. Bill Hagerich at Ft. Lee, VA. ~~Mr. Hagerich~~ who is the caretaker of the AMMDB. Mr. Fritz, said the data had not been gathered in a long time. He referred Mr. Klebo to Mr. Miller for further information.

8. Mr. Klebo has been unable to contact Mr. Miller or Mr. Hagerich to date, but will continue to pursue contact with them.

ROBERT E. KLEBO
IEW BSS Team

Appendix Y

USAIC&FH Memo, undated, IEW Sustainment Study

ATSI-CDM (70-1i)

MEMORANDUM FOR Director, U.S. ARMY CECOM INTELLIGENCE MATERIEL MANAGEMENT CENTER, ATTN: SELIM-PA (MR DUTTON) VINT HILL FARMS STATION, WARRENTON, VIRGINIA 22186-5276

SUBJECT: IEW Sustainment Study

1. After review of the minutes of the 11 DEC 91 DA IPR, the following comments are submitted for the study group's consideration.

2. The problem statement clearly focuses on both the cause and the symptoms which have followed. Specifically, the problem is lots of people buying, building, fielding great technology through non-traditional (read, in most cases, non-TRADOC) processes which meet users' needs but are not supportable through the standard Army structure. The symptoms seen are a proliferation of low density, high cost systems with a corresponding number of unique non-integrated logistic support processes. The study's solution, particularly if it will be considered for army wide application, must address both the symptoms and the problem itself.

a. The study's plan of attack and proposed products comprehensively seek to institutionalize a logistics support structure and process which recognizes and is responsive to an Army equipped with both standard and non-standard equipment. We believe this is absolutely crucial. Technology life cycles will demand a flexible, tailorable structure in support of equipment for all battlefield operating systems which does not currently exist. This part of the study addresses well the symptoms and must be done.

b. Solving the problem requires both TRADOC and DA action. The problem from a TRADOC perspective is that our current acquisition process cannot field equipment within 2-4 year technology life cycles. We have grown a tremendous bureaucracy whose focus is paperwork rather than equipping the force. Simply stated, the reason we field systems the way we do is because the TRADOC process does not do the job. We can no longer afford the time, budget or TDA force structure associated with this morass. This does not mean centralize the combat developments mission but rather streamline the tremendous bureaucratic study, review and approval structure which burdens the mission. As a minimum, we recommend the study's results identify this problem.

We also know how to do it better. The prototype success of HAWKEYE and TENCAP systems demonstrates that concurrent engineering rapidly delivers current technology that the user wants. We can overlay the training, personnel and logistics aspects of the acquisition process. However, this will never occur unless we establish a new TRADOC process which supports rapid development and fielding of evolving technology.

c. Another aspect of the problem is that anyone with a good idea and money can buy and field a system and then expects the Army to support it. This talks to discipline and standardization in the process. The Army Intelligence Master Plan can be the vehicle through which all future user needs are identified and supported. However, it has not been used as such except within TRADOC. IEW experiences more problems in this area because the mission area encompasses the needs of commands from national to tactical. We also have multiple solvers of our needs - PEO-IEW, PEO-CCS, CECOM, ASPO, INSCOM, MACOMS/CINCS. As already demonstrated, without DA discipline of non-TRADOC acquisition processes, non-TRADOC acquired systems will duplicate and possibly conflict with the AIMP. Without this discipline, proliferation of non-standard, low density systems will undermine the viability of any future support structure proposed by the study. The Technology Assessment Center being established at USAICS seeks to fix a portion of the problem by bringing together the user, CECOM, PEO-IEW, AMC, and LABCOM. This effort will build on the open architecture concept already followed by PEO-IEW. Recommend the study identify the independence of TRADOC and non-TRADOC acquisition processes as a problem in its findings and recommend a formal means for bringing discipline within non-TRADOC system acquisition. As part of this initial input we have included the systems (encl 1) which should be considered for review by the study team and our version of the system profile sheet (encl 2) used to collect system related data.

3. In summary, the study will achieve much if it identifies an IEW support structure that accomodates low density, high tech systems. However, the Army must move to a concurrent engineering and acquisition process unburdened by the current monolithic paperwork, bureaucratic review and approval structure. It must also bring discipline to the multiple ways with which it acquires systems if it wants to deal with the heart of the problem. This study has the opportunity to describe comprehensively the solution.

4. Point of contact, this action, LTC Trauth, Chief, Master Plans Div, AUTOVON 879-2274.

2 Encls

FREDERICK W. JOHNSTON III
Colonel, MI
Director, Combat Developments

SYSTEM PROFILE

SYSTEM NOMENCLATURE:
PROJECT NAME:
NSN:
LIN:
TYPE CLASSIFICATION:
DEVELOPMENTAL/NDI/COTS:
SYSTEM SECURITY CLASSIFICATION:
TABULATED DATA:
SYSTEM PURPOSE:
SYSTEM DESCRIPTION:
EQUIPMENT REPLACED:
PRIME MOVER:
POWER SOURCE:
ACQUISITION STRATEGY DOCUMENTATION:
- MATERIEL FIELDING PLAN:
- FIRST UNIT EQUIPPED:
- BOIP:
- QQPRI:
- FIELDING DENSITY:
- ILS:
- LSA:
- CLS OR ICS CONTRACTS:
    - Managing Proponent
    - Contractor
    - Funding
    - Support agreement
    - Cost

SYSTEM LIFE CYCLE STATUS:
PROGRAM MANAGEMENT DOCUMENTS:
COMBAT DEVELOPER:
PROGRAM MANAGER:
ITEM MANAGER:
SUSTAINMENT COMMAND:
SPECIAL HANDLING:
DATE FOR USE TERMINATION:
DESERT SHIELD/STORM USE:

IEW SUSTAINMENT STUDY
EQUIPMENT SET

CURRENT FIELDED SYSTEMS:

AN/TSQ-138 TRAILBLAZER
AN/TRQ-32(V) TEAMMATE
AN/ALQ-151(V) QUICKFIX

FUTURE SYSTEMS:

GROUND BASED COMMON SENSOR (GBCS)- HEAVY/LIGHT
ADVANCED QUICKFIX (AQF)
GUARDRAIL COMMON SENSOR (GRCS)
AERIAL COMMON SENSOR CORPS (ACS-C)
JSTARS GROUND STATION MODULE (GSM)
UNMANNED AERIAL VEHICLE (UAV) - CLOSE/SHORT RANGE
ALL SOURCE ANALYSIS SYSTEM (ASAS)/HAWKEYE
COMMANDERS TACTICAL TERMINAL (CTT, CTT-H, CTT-H/R)
INTEGRATED METEOROLOGICAL SYSTEM (IMETS)

ORC SYSTEMS:

AN/PRD-10
AN/PRD-11
AN/TSQ-152 TRACKWOLF

LOW DENSITY SYSTEMS:

AN/TSQ-130(V) TECHNICAL CONTROL ANALYSIS CENTER (TCAC)
AN/MSA-34 TACTICAL AND ELECTRICAL FACILITY (OUTS)

NON-STANDARD PROCUREMENT SYSTEMS:

FORSCOM AUTOMATED INTELLIGENCE SUPPORT SYSTEM (FAISS)
SANDCRAB (AN/TLQ-17A W/SPECIAL ANTENNA)
TROJAN SPECIAL PURPOSE INTEGRATED REMOTE INTEL TERMINAL (SPIRIT)
TROJAN AIR TRANSPORTABLE ELECTRONICS RECON SYSTEM (TATERS)
GOLDWING (HF DATA COMPACTION RADIO SYSTEM)
AIRBORNE RECONNAISSANCE - LOW (ARL)
DRAGONFIX (TSQ-164 GROUNDBASED HF/DF COLLECTION SYSTEM)
SMALL AEROSTAT SURVEILLANCE SYSTEM (SASS)
FORWARD AREA SID (SECONDARY IMAGERY DISSEMINATION) TRAP
(TACTICAL RECEIVE EQUIPMENT AND RELATED
APPLICATION)/IMPROVED (FAST-I)

ASPO SYSTEM PROCUREMENT:

TACTICAL HIGH MOBILITY TERMINAL (THMT)
MOBILE INTEGRATED TACTICAL TERMINAL (MITT) (DOWNSIZED THMT)
IMAGERY PROCESSING DISSEMINATION SYSTEM (IPDS)
ELECTRONIC PROCESSING DISSEMINATION SYSTEM (EPDS)
TACTICAL ELECTRONIC PROCESSOR (TEP) (2D GENERATION EPDS)
MINITURIZED IMAGERY RECEIPT SYSTEM (MIRS)
ENHANCED TACTICAL USER TERMINAL (ETUT)
TACTICAL RADAR CORRELATOR (TRAC)

Appendix Z

BDM Paper, undated, Subj: Maintenance Doctrine Literature Review and Assessment

Task 1: Maintenance Doctrine Literature Review and Assessment

1. *Standard Army Maintenance Doctrine*

a. Standard Army maintenance doctrine, identifying four levels of maintenance, is followed for most high density major weapons systems. Modifications to the four-level maintenance doctrine have been adopted for low density systems with a requirement to sustain high levels of readiness.

b. The standard doctrine calls for four normal levels of maintenance support and several specialized levels of maintenance support. Included in normal support levels are unit maintenance, direct support maintenance, general support maintenance, and depot level maintenance. Each level has specific areas of responsibility and *typical* capabilities. Army Regulation (AR) 750-1 provides extensive definitions for each maintenance level that can be summarized as follows:

(1) Unit Maintenance. Preventive and corrective maintenances performed by a using unit on its own equipment.

(2) Direct Support (DS) Maintenance. Maintenance actions to support equipment by repairing and returning materiel directly to the user, repairing high usage components for reparable exchange (RX), and maintaining and controlling the use of operational readiness floats (ORF). DS also provides back-up support for unit level maintenance.

(3) General Support (GS) Maintenance. Maintenance actions required to support a force as a whole rather than specific units. Normally located at echelons above corps (EAC), GS maintenance units perform maintenance in support of the theater supply system through the repair of assemblies, components, and modules, RX items, and printed circuit boards (PCB). GS maintenance provides back-up support for DS units.

(4) Depot Maintenance. Highest level of maintenance, performing tasks which cannot be performed at lower levels. Primarily in fixed facilities in the continental United States (CONUS) oriented towards production line repair.

(5) Specialized Repair Activity (SRA). Not a separate level of maintenance, SRAs are GS units selected by major commands (MACOM) and approved by HQDA to repair selected items identified by the maintenance code of D (depot) or L (SRA).

c. Intelligence and Electronic Warfare (IEW) units use the standard Army maintenance system for all commodities except communications-electronics (C-E) and IEW equipment. Vehicles, generators, and environmental equipment organic to military

intelligence (MI) units are maintained per standard maintenance doctrine from the unit to DS at the division maintenance (or main support/forward support) battalion, and from the division to the GS level. Aviation systems are handled differently than ground systems, with some units having contractor personnel within the unit to provide support for the aircraft. Divisional MI battalions are currently authorized unit and DS repair of both C-E and IEW equipment. Personnel and equipment are authorized on the unit Table of Organization and Equipment (TOE) to permit this level of repair within the communications and electronics (C-E) maintenance activity in the battalion. Other MI units may have a variety of other authorizations, but, in all cases, MI units are authorized to perform unit and DS repair on organic IEW equipment.

d. The maintenance procedures for IEW-unique equipment have been directed doctrinally by the post 1980 maintenance concept for SIGINT/EW equipment approved by HQDA in the late 1970's. This document generally set the standard procedures for maintenance in support of IEW equipment. Several shortfalls in implementation of the post 1980 concept prevented it from being totally and consistently adopted. One of the first problems surfaced was that spares were not available in sufficient quantities upon initial fielding preventing implementation of a full DX capability at the GS unit. The lack of test, measurement, and diagnostic equipment (TMDE) at the GS level also constrained the level of repair that could be accomplished. The long delay in fielding test program sets (TPS) to the automatic test equipment (ATE) sections at GS level was another significant factor in preventing total policy implementation. For these principal reasons, interim contractor support (ICS) and full contractor logistics support (CLS) is in place for many systems.

e. The standard maintenance flow for IEW equipment currently includes the operator and unit level within the MI company, DS maintenance at the battalion level, and GS and depot maintenance at EAC. Additionally, US Army CECOM Intelligence Materiel Management Center (USACIMMC) has deployed contractor maintenance cells to most IEW GS maintenance detachments, designating these cells as special repair activities (SRA). This configuration can be seen graphically in Appendix A. Maintenance repair of tactical IEW equipment follows a variety of procedures and channels. Several repair channels for tactical IEW equipment are shown graphically in Appendix B. Corps maintenance flow is shown for IEW equipment fielded by USACIMMC. Maintenance channels for several other fielded IEW systems are also included.

f. Maintenance related publications available at USACIMMC for review of the standard Army maintenance system are listed in Appendix C.

2. *IEW Maintenance Problem Areas and Concerns*

a. Understanding current IEW maintenance procedures and channels of support forms the basis for attempts to streamline the IEW maintenance system and to modify the current support concept. The current system resulted from adopting one concept in a variety of ways to accommodate system fieldings over the years. Maintenance concept problems

arose as new systems were fielded with their own unique support concepts. Contributing to the problem is the fact that MACOMs differ in the ways they support new equipment. Some fieldings were initially in such low quantities that *stovepipe* support made economical sense, but later fieldings to a larger number of units invalidated the original reasons for stovepipe support. An extensive analysis of the current posture of IEW maintenance on a system by system basis appears to be the best approach toward determining if all of the systems being evaluated can be supported in the same standard manner.

b. As a result of the maintenance policy differences between types of system, differences among the MACOMs, and changes in maintenance doctrine and procedures since the post 1980 maintenance concept was promulgated, IEW maintenance today reflects a variety of conditions and procedures. Maintenance channels for divisional MI battalions are normally standardized by MACOM and by fielding activity, but exceptions by unit and by equipment type do exist.

c. The table below indicates whether or not maintenance support is available at the various levels by system. Note the variance of support mechanisms in place. A variety of contractors provides IEW systems maintenance as depicted in the right hand column.

IEW Streamlining Study Current Systems List

System	Common Name	Unit	Direct Support	General Support	SRA Support	OEM/ Depot	Support Contractor
AN/ALQ-133	QUICKLOOK						
AN/ALQ-151	QUICKFIX	Y	Y		Y	B46	ManTech
AN/APS-94F	OV-1D/SLAR						
AN/FSQ-144()	TROJAN SPIRIT	Y	Y		Y	OEM	ManTech
AN/GRQ-27	GOLDWING	Y	Y	Y		Ft. Gillem	FGL/C&C
AN/PRD-11	MANPACK DF	Y	Y	Y		TOAD	
AN/TLQ-17A	TRAFFICJAM	Y	Y		Y	B46	ManTech
AN/TLQ-17A (V)3 (MOD)	SANDCRAB	Y	Y		Y	B46	ManTech
AN/TRQ-32	TEAMMATE	Y	Y		Y	B46	ManTech
AN/TRQ-37	TACFIX	Y	Y	Y		TOAD	
AN/TRR-27A	P/O OUTS	Y	Y		Y	B46	
AN/TSQ-130	TCAC	Contractor			GE	GE	GE
AN/TSQ-132(V)2	J-STARS GSM	Contractor				Motorola	Motorola
AN/TSQ-134	EPDS	Contractor					

IEW Streamlining Study Current Systems List (cont.)

System	Common Name	Unit	Direct Support	General Support	SRA Support	OEM/ Depot	Support Contractor
AN/TSQ-138	TRAILBLAZER	Y	Y		Y	B46	ManTech
AN/TSQ-164	DRAGONFIX	Y	Y	Y		Ft. Gillem	Andrews
AN/ULQ-11	CEFIRM LEADER						
AN/ULQ-19	RACJAM	Y	Y	Y		TOAD	
AN/USD-9	GUARDRAIL V	w/Depot Rep				SAAD	
AN/USD-9A	I-GUARDRAIL						
AN/UYK-71A	MICROFIX	Y	Y	Y		Ft. Gillem	GA Tech
OW108/TSQ-134	ETUT	Contractor					
OW109/TSQ-134	THMT						
	HAWKEYE	Y	GE			GE/OEM	GE
	IPDS						
	SOCRATES	Y			GTE	GTE	GTE

d. Areas for additional investigation

(1) The current maintenance support mechanism was not available for six of the 26 systems that are currently being evaluated. An understanding of how maintenance support is provided for each system is required to complete the assessment.

(2) Given that the current maintenance procedure for each system resulted from a review and decision process, access to records reflecting that process, or to people with knowledge of the process would be invaluable. Decision material used in the past, to include theater-specific conditions, would provide an effective data point for the IEW Streamlining effort. Researchers would be able to identify past drivers and assess their current relevance.

(3) What authorization documents allow the MACOMs to provide maintenance support off-line in a stovepipe mode of operation?

(4) What is the price tag on the current support structure and how much could be saved by bring the support under a common structure?

(5) To what level has the system completed an Integrated Logistics Support Plan (ILSP) that may provide information for integration into the standard Army system?

e. Areas of concern:

(1) Can contractor personnel in the units be replaced by DA civilian personnel or could the duties be assumed by military personnel? What training and/or transition period would be required to accomplish this action?

(2) Are contractor personnel in the units deployable with the units in time of war?

(3) Are support mechanisms available to provide parts and evacuation of failed items for contractor supported systems? A follow on to this question is whether parts support must be provided only by the original equipment manufacturer (OEM), or can parts be procured from other commercial and military sources.

(4) Is failure data being collected by the support contractor to document failures, man-hours spent in repair of equipment, and readiness of the system?

(5) If the system is under a combination of contractor and military support, has the manpower requirement been formalized to provide personnel and support equipment to the proper units?

3. *Recommendations*

a. Recommend that the MACOM or Program Manager office as required be queried on the following questions:

(1) What prevents this system from being transitioned to full Army support? Provide a short answer with major reasons only.

(2) What authorization does this system have to fall outside of the standard Army maintenance system? Provide a copy of the authorization document if possible.

(3) What contract vehicles are currently providing support for this system? Provide information on all contracts and memorandums providing for support of the system. Include duration of the contract, when it expires, cost per year, and total number of personnel provided by the contract with locations of these personnel.

(4) Does the current contract include a war clause providing for required support in time of conflict?

(5) If Army personnel are providing some support for the system, has the requirement for this support been documented to the Army so that the personnel requirements are provided to the unit?

(6) Are there any mechanisms currently in place to provide failure data on the system at the unit level, contractor level, and depot/OEM level? If so, how can this information be obtained?

b. Recommend the following analysis be completed after responses have been received:

(1) Determine if the system can be transitioned to full Army support. If it can not be transitioned to full support, determine to what level of support it can be transitioned to, and where and at what level contractors would be required to provide maintenance for the system.

(2) Build a matrix of personnel required to support each system at each level, including military personnel, contractors, and DA civilians. If possible this information must come from the qualitative and quantitative personnel requirements inventory (QQPRI) and basis of issue plan (BOIP) information on each system. If the information is not available from these sources, it would have to be obtained from the MACOMs. Once the matrix is built, a decision must be made on maintenance support requirements at each level and who will provide this support; i.e., military personnel, contractors, or DA civilians.

(3) Determine which contracts can be combined, modified, or combined into one overall support contract. Perform a cost analysis to determine if consolidation would be cost-effective.

(4) Determine what training is available for each system by maintenance level. If no formal training is available, consider contractor or DA civilian support for maintenance at the level which has no formal training.

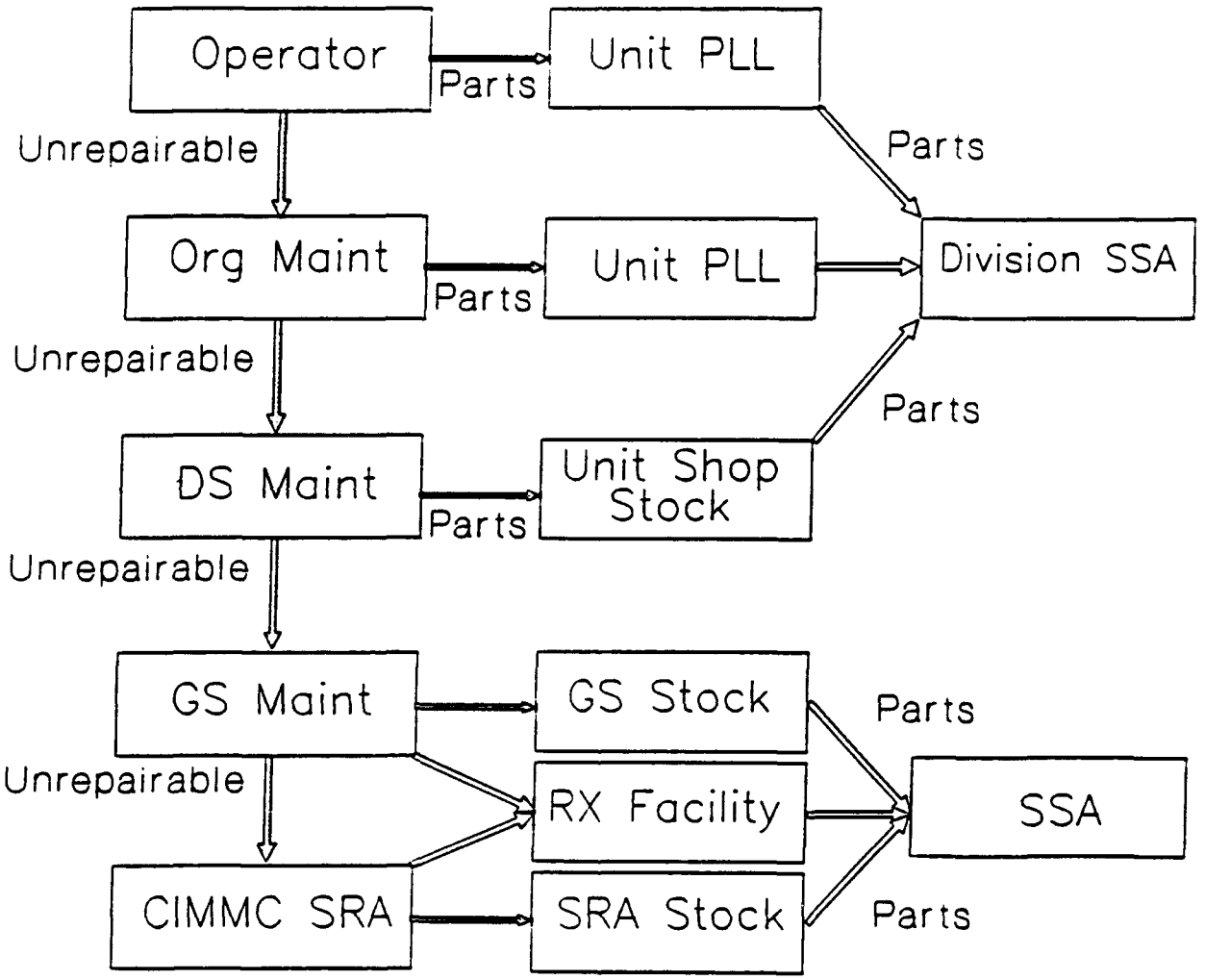
(5) Failure data should be provided to Army materiel management centers to determine if the system can be incorporated into standard supply channels or if off-line OEM supply is required.

(6) Support requirements in each MACOM should be reviewed to determine the best support package for the MACOM and to determine whether or not support can be formalized into a standard format. The form of the final maintenance support to the MACOMs will need to be determined in line with any changes in Army doctrine currently being studied or implemented.

(7) A concerted effort should be made to fit the maintenance support into an Army standard format with single points of contact for support at each level. Additionally, support channels should be similar from MACOM to MACOM.

Appendix A
Standard Army Maintenance Support for IEW Equipment

Standard Army Maintenance Flow



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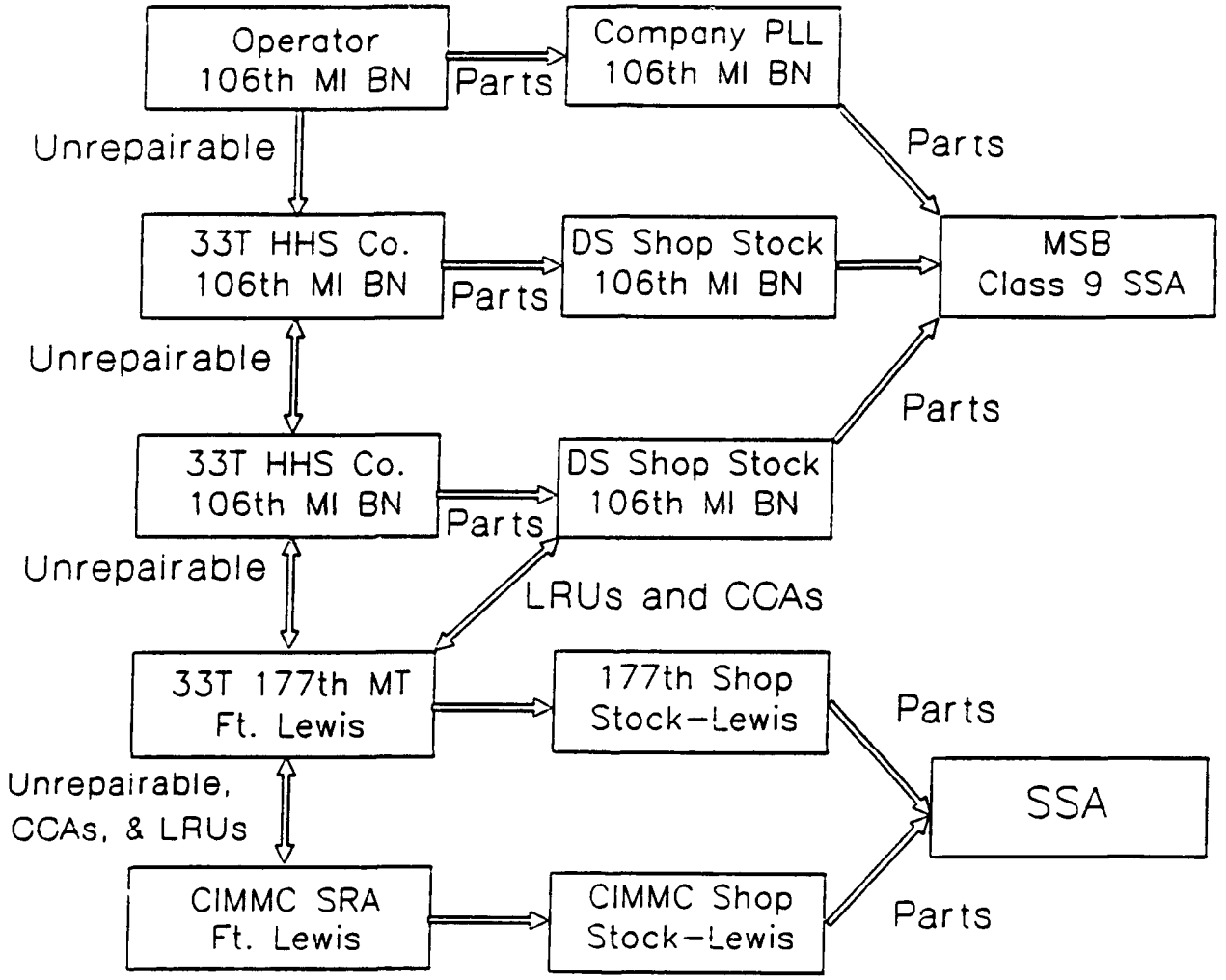
Appendix B
Corps Maintenance Support for IEW Equipment

I Corps
Maintenance Flow



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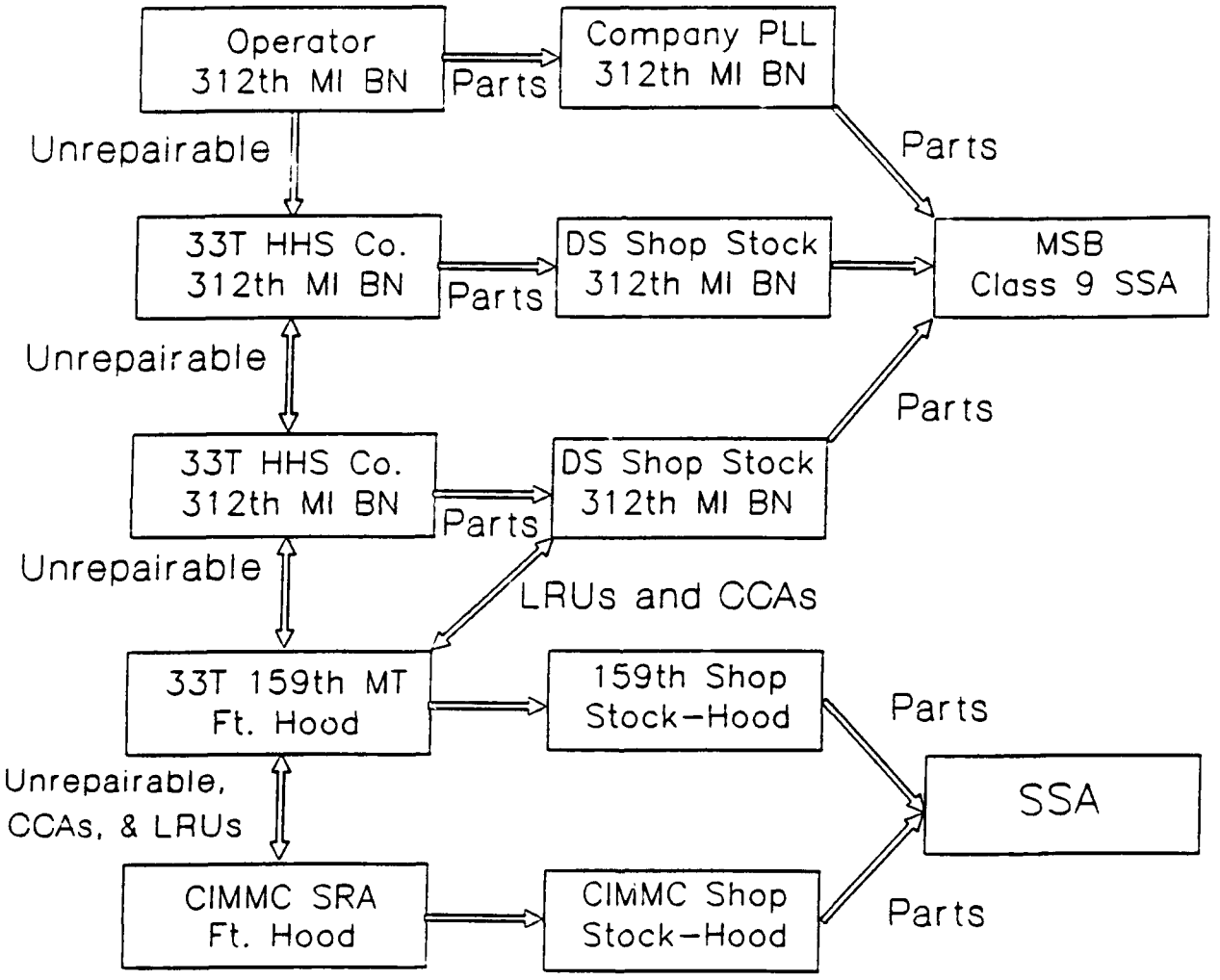
III Corps
Maintenance Flow



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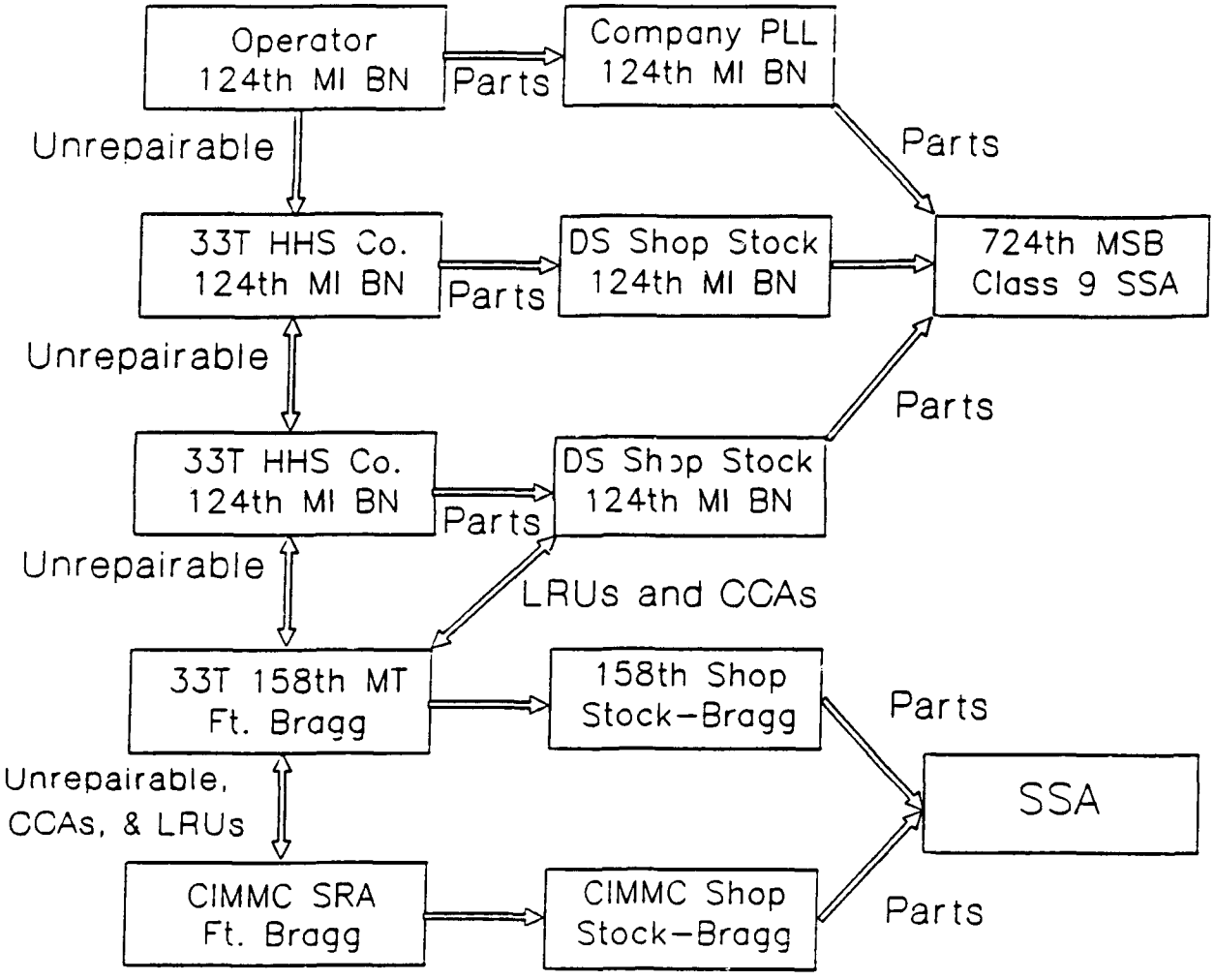
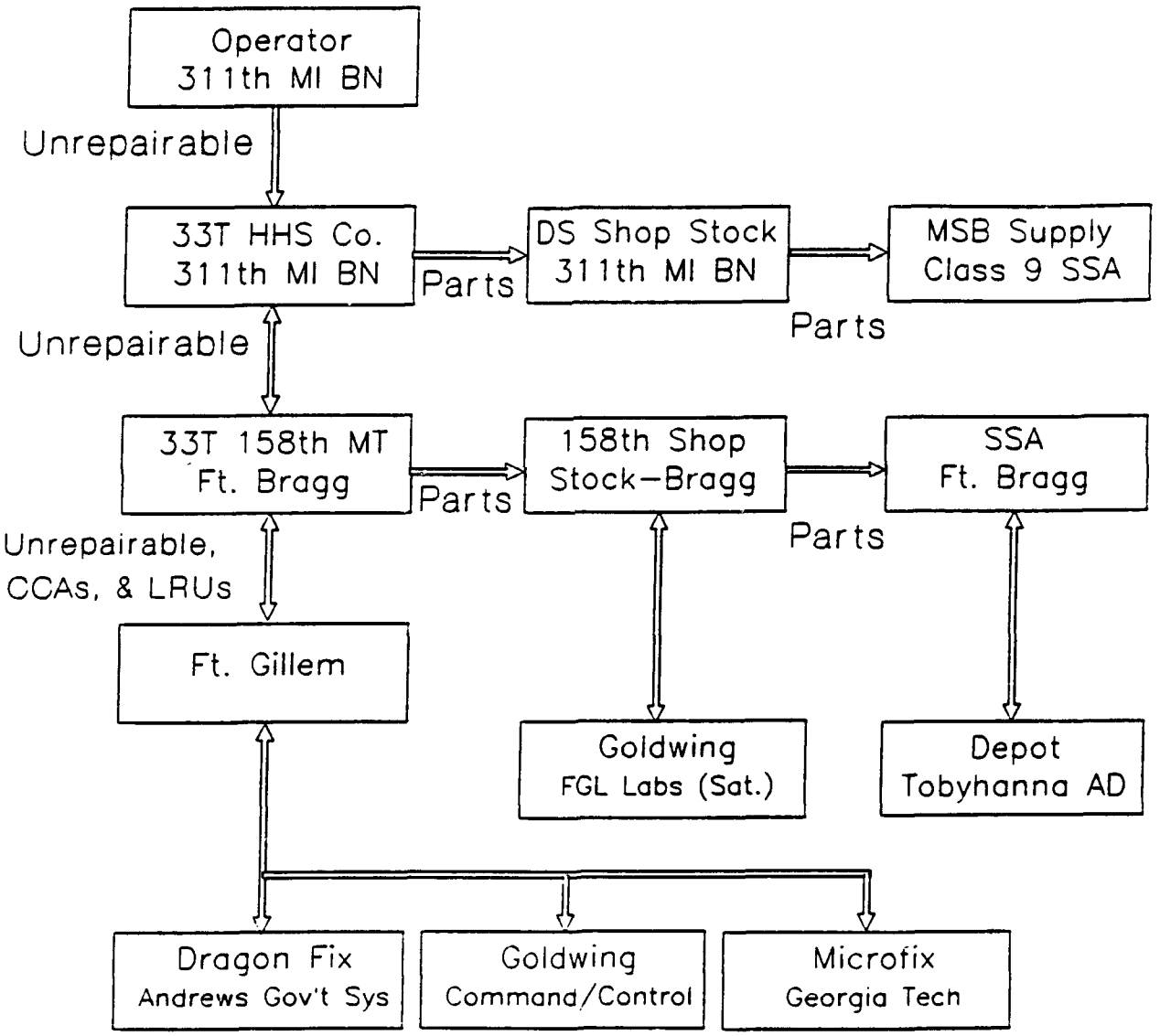
18th Airborne Corps
Maintenance Flow



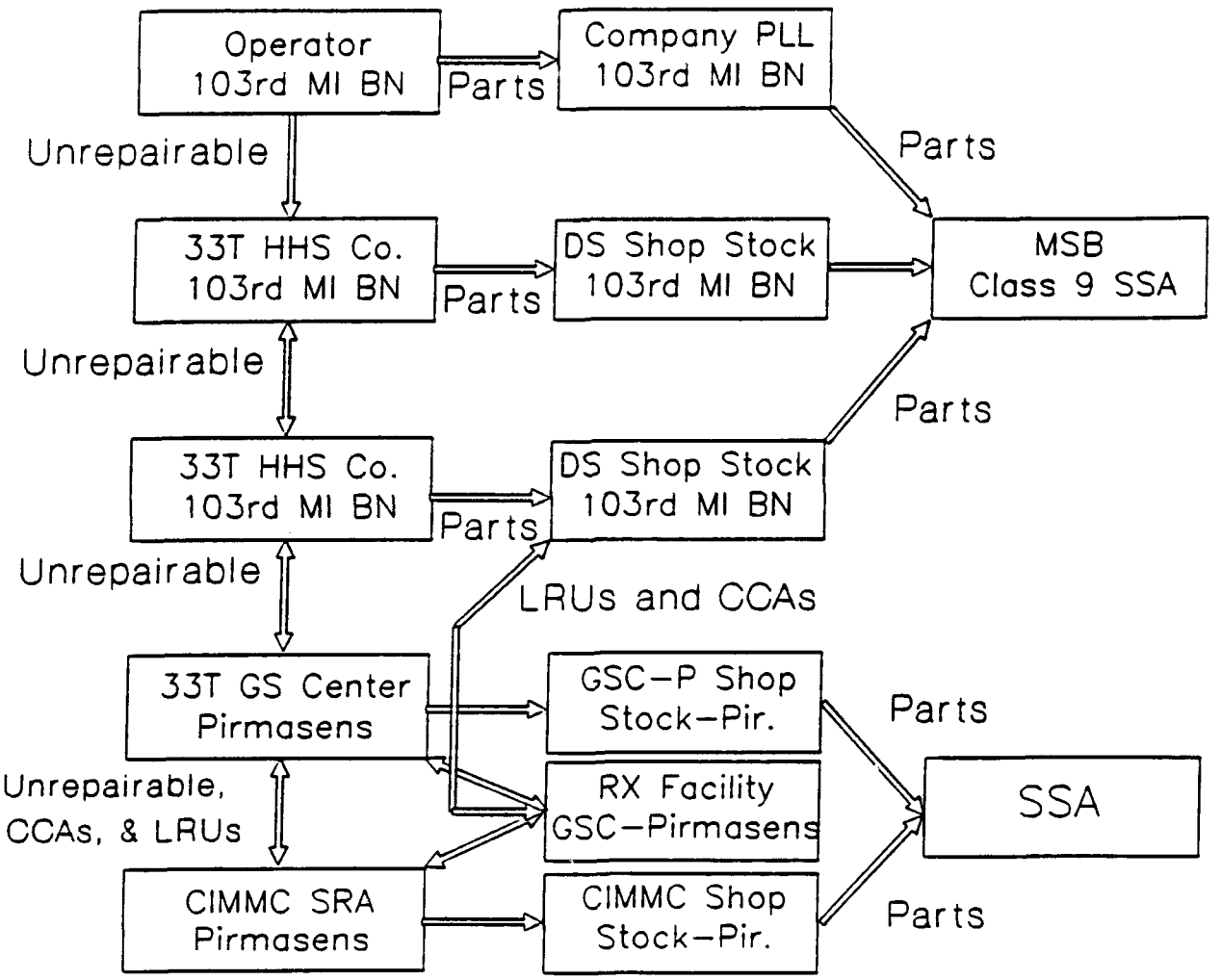
Trip Report–Ft Stewart 4/2/92
DA IPR Brief 4/28/92

FORSCOM NDI
Maintenance Flow
(Typical)



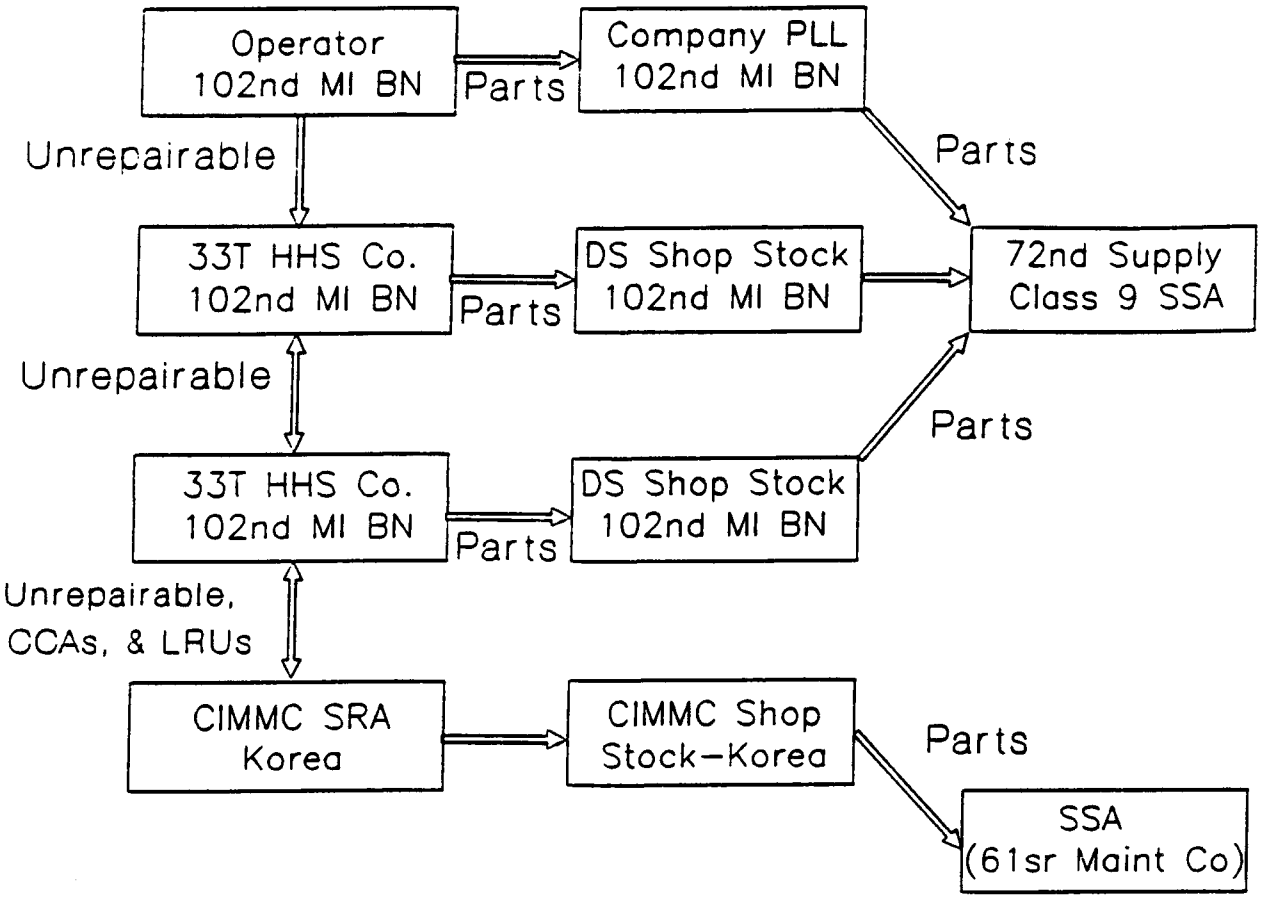
DA IPR 4/28/92

USAREUR
Maintenance Flow



DA IPR 4/28/92

8th Army
Maintenance Flow



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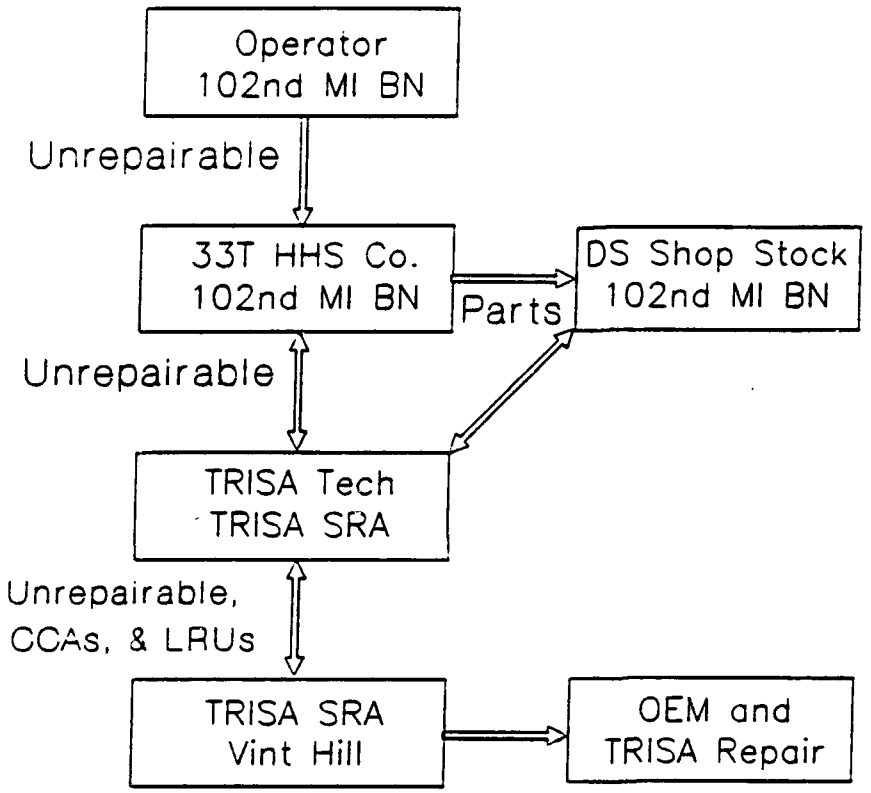
Trojan Spirit
Maintenance Flow
(Typical)



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Appendix C
Maintenance Publications Available for Review

Maintenance related publications available for review of the standard Army maintenance system included:

AR 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations
DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS)
FM 29-12, Division Maintenance Operations
FM 34-22, Military Intelligence Battalion Combat Electronic Warfare and Intelligence
FM 34-23, Military Intelligence Battalion (Tactical Exploitation)
FM 38-725, Direct Support System (DSS) & Air Line of Communications (ALOC)
FM 43-5, Unit Maintenance Operations
FM 43-11, Direct Support Maintenance Operations (Non-Divisional) Coordinating Draft
FM 43-12, Division Maintenance Operations
FM 43-20, General Support Maintenance Operations
FM 63-2, Combat Service Support Operations - Division
FM 63-3, Combat Service Support Operations - Corps
FM 63-5, Combat Service Support Operations - Theater Army
FM 750-80, Army Wholesale Maintenance Management
Report: Concept of Maintenance for Support of Tactical SIGINT/EW Systems (Post 1980)

Appendix AA

BDM Paper, undated, Subj: Automated Maintenance Systems Literature Review and Assessment

Task 2. Automated Maintenance Systems Literature Review and Assessment

1. *Army Maintenance Automation Systems*

a. Currently there are several automated maintenance systems in use in the U. S. Army from the unit level to the wholesale level, most falling under the umbrella of the Standard Army Management Information Systems (STAMIS). The primary system at the unit level is the Unit Level Logistics Systems (ULLS). At the support level, both direct support (DS) and general support (GS), the primary automated maintenance system is the Standard Army Maintenance System (SAMS). At the wholesale level, systems such as Commodity Command Standard System (CCSS) and the Standard Depot System (SDS) are in use. In addition to these automated systems for maintenance, there is the Standard Army Retail Supply System (SARSS) which interfaces with SAMS. Other supply automation systems providing data to the maintenance automation systems are the Standard Army Intermediate Level Supply Subsystem (SAILS), and the Direct Support Unit Standard Supply System (DS4). The flow of reports from the various automated maintenance systems is shown in Appendix A.

b. ULLS automates many of the logistics functions at unit level. It provides a means for the unit commander to manage the unit's maintenance and supply operations, including the areas of prescribed load list (PLL), operational records including dispatch and drivers records, historical records, usage records, and readiness reporting. ULLS is designed to interface with SARSS for supply management, with SAMS-1 for maintenance and readiness data, and with SAMS-W at the wholesale or Materiel Readiness Support Activity (MRSA) level. The various capabilities of the ULLS system may be seen from the software menu selections depicted in Appendix B.

c. SAMS-1, found at the DS and GS levels of maintenance, automates work order management, serial number tracking, shop stock management, bench stock lists, operational readiness floats (ORF), parts requisitioning, and maintenance scheduling within the unit. It is designed to interface with ULLS for unit level information and automated work order submission and status, with SARSS for supply management, and with SAMS-2 for overall maintenance management at the division, corps, or theater level. SAMS-1 also has the capability to use logistics applications of automated marking and reading symbols (LOGMARS) equipment, which provides the capability of bar coding parts and equipment. The various capabilities of the SAMS-1 system may be seen from the menu selections for the software as shown in Appendix C.

d. SAMS-2 is normally found at the materiel management center (MMC) level, and at some Corps Support Command (COSCOM) maintenance support battalions. It is oriented toward the management of maintenance on a larger scale than SAMS-1, incorporating data from several SAMS-1 systems. It enables managers to track workloads, equipment status reports, work order cost data, and ORFs. SAMS-2 provides the interface

between the retail and wholesale levels of operation. The various capabilities of the SAMS-2 system may be seen from the software menu selections as illustrated in Appendix D.

e. SAMS-W is found only at MRSA and performs the function of collecting maintenance information from the retail community and consolidating it into various databases which are used by both the retail and wholesale communities.

f. Publications available at USACIMMC for review of automated maintenance systems are listed in Appendix E.

2. *Maintenance Capabilities Through Automation*

a. The automation available through ULLS and SAMS-1 gives the Military Intelligence (MI) unit, at both the company level and battalion DS level, excellent tools for managing and controlling maintenance operations. Both ULLS and SAMS-1 give the maintenance activity capabilities in both the maintenance and supply areas, greatly improving the speed, accuracy, and throughput of maintenance and supply paperwork. The increased capabilities to track and manage maintenance do not directly fix more equipment, but allow managers to better control maintenance operations. This increased capability frees repairmen from administrative requirements (or decreases the number required), allowing participation in the actual repair process. Additionally the maintenance workload can be determined, allowing managers to allocate scarce maintenance resources to the equipment with the highest priority.

b. Maintenance at the unit level is significantly enhanced through the following capabilities of ULLS:

(1) Tracking maintenance services is accomplished automatically once equipment is entered into the ULLS system. This tracking includes monthly, semi-annual, and annual services on the equipment and oil analysis requirements for vehicles and generators.

(2) ULLS will generate an equipment maintenance and inspection worksheet that expedites inspection and repair of equipment. The automated form lists administrative information and parts requisitioned against the equipment.

(3) ULLS will also generate an automated request for maintenance to the DS level. The request provides detailed information on the equipment and relieves the maintenance personnel of the requirement of duplicating information that is already available in the automated database. The information is submitted to the DS level in hard copy and in electronic form, relieving the DS level from re-keying the information (source data automation) , thereby speeding up the process.

(4) ULLS also provides an automated maintenance request register that simplifies the management of maintenance at the unit level.

(5) Operational records within ULLS include equipment dispatch, service schedule, and operator records including vehicle licensing and testing record.

(6) Equipment reports available include equipment availability, equipment fuel usage, non-mission capable equipment, and historical equipment records.

c. Maintenance at the DS level is improved through the following capabilities of SAMS-1:

(1) Work orders are auto-generated from support units through the ULLS interface.

(2) Automated tracking of maintenance work supporting management and manpower controls. Again this capability allows the maintenance manager to allocate resources where they are most needed, and to track the specifics of all repair actions.

(3) SAMS-1 provides automated tracking of ORF, bench stock, shop stock, and repair parts. The extensive supply capabilities provide for the automated review of parts, parts requisitioning, unserviceables, and excess parts turn-in, the document register with follow-up capabilities, and the logging of parts installed and required for each maintenance action.

(4) SAMS-1 provides accounting for direct maintenance manhours, indirect maintenance manhours, and nonproductive manhours. This action is accomplished by tracking actual manhours applied to each maintenance action by all maintenance personnel involved in the repair of the item.

(5) SAMS tracks the individual work order on each item of equipment, logging all maintenance actions on the item, all repair parts installed on the item, and all repair parts required to complete the repair of the item. The system provides for both the automated tracking of the equipment and a hard copy process for use by the repair personnel.

(6) SAMS currently provides the capability to track and control funds for expendables and the actual cost to repair for all repair actions, but it is not a full financial package for Army users.

(7) Automated reports to both the user level, ULLS system, and to the next higher level are available. Additionally, an automated interface into the supply system through the supply support activity (SSA) is available in SAMS. The automated reports provide a daily inoperative equipment report, a weekly work order backlog and maintenance actions report, along with a report of actual manhours expended in direct support of user units.

(8) Available maintenance reports include a work order master list, shop section work order summaries, customer work order reconciliation listings, work order detailed lists, current equipment status, backlog, and manpower and manhours available.

d. IEW maintenance activities at the GS level would also use the SAMS-1 system. SAMS-1 is designed for use at the DS maintenance shop found in separate brigade, division, corps, and echelons above corps (EAC) units along with the GS maintenance units located at EAC. This listing includes the DS maintenance sections within the MI battalions and MI companies, and the GS SIGINT/EW maintenance detachments at the EAC level.

e. The additional automated systems available to Army personnel do not impact directly on IEW maintenance. They provide auxiliary services and capabilities to the two primary automated system, ULLS and SAMS-1. The transfer of maintenance data from ULLS to SAMS-1 and then to SAMS-2 and on to SAMS-W provides managers of IEW maintenance above the unit and battalion levels the capability to track maintenance within the units and allows accumulation of maintenance data not available with non-automated maintenance activities.

3. *Automation and the MI Community*

a. Maintenance activities within the MI battalion are often dependent on the level of expertise and experience of the maintenance chief. The automation capabilities available to support maintenance activities are often not fully implemented because the maintenance chief has either not used the equipment/system before or is not comfortable with automation. Additionally, maintenance automation suffers from the same problems as all automation, garbage into the system results in garbage out of the system. Failure to use available automation results in additional work, primarily manual, and contributes to unit backlogs by tying up personnel with administrative work that could be automated. Frequently the maintenance reports available through SAMS-1 are not used by management personnel due to a lack of knowledge within the unit. Division support battalions, corps maintenance battalions, and other mainstream maintenance activities doing DS and GS repair are required by higher headquarters to use SAMS automation equipment. However, these same higher headquarters may not always require the MI battalion DS maintenance activity to use automation, in part because these headquarters are not responsible for IEW equipment maintenance.

b. At the current time, no reports available at the wholesale level as outputs from the ULLS to SAMS to SAMS-W connection are being used or examined by personnel involved with the sustainment of MI equipment. The information is not complete because ULLS has not been fielded to some units, and SAMS-1 is not fully implemented in all units. Use of the data available from MRSA would quickly identify MI units using the ULLS and SAMS-1 systems allowing an analysis and comparison of this information with other information available.

c. Automation above the DS and GS maintenance units is transparent to the units performing maintenance on IEW equipment, although, with SAMS-1, information can be provided to ULLS to update job order status. Wholesale level activities provide updates to the supply catalogs within the ULLS and SAMS-1 databases and provide status to the SAILS, DS4, and SARSS automated supply systems which then is transferred to the SAMS-1 and ULLS systems.

4. *Other Automation Systems*

a. Several MACOMs have developed additional systems that can be used to automate some maintenance and supply functions. For the most part these systems are specific to one type of function.

b. Nonstandard automation systems should be discouraged because they often replace some of the functions of ULLS or SAMS. If the use of the nonstandard systems is mandatory, then similar portions of ULLS and SAMS are not used, and the information available from ULLS and SAMS is not as accurate or complete as it could be when it is sent to the wholesale level.

5. *Recommendations*

a. Both ULLS and SAMS-1 should be implemented within the MI units in the field, to include the GS IEW maintenance detachments. A key to the use of this automation in the MI community is training for the senior NCOs and warrant officers within the units.

b. All 353A IEW maintenance warrant officers should be trained in the use and capabilities of the ULLS and SAMS-1 equipment. This training would provide the maintenance supervisors of MI equipment a good understanding of maintenance automation equipment and a common departure point for implementation of automation within their maintenance activities.

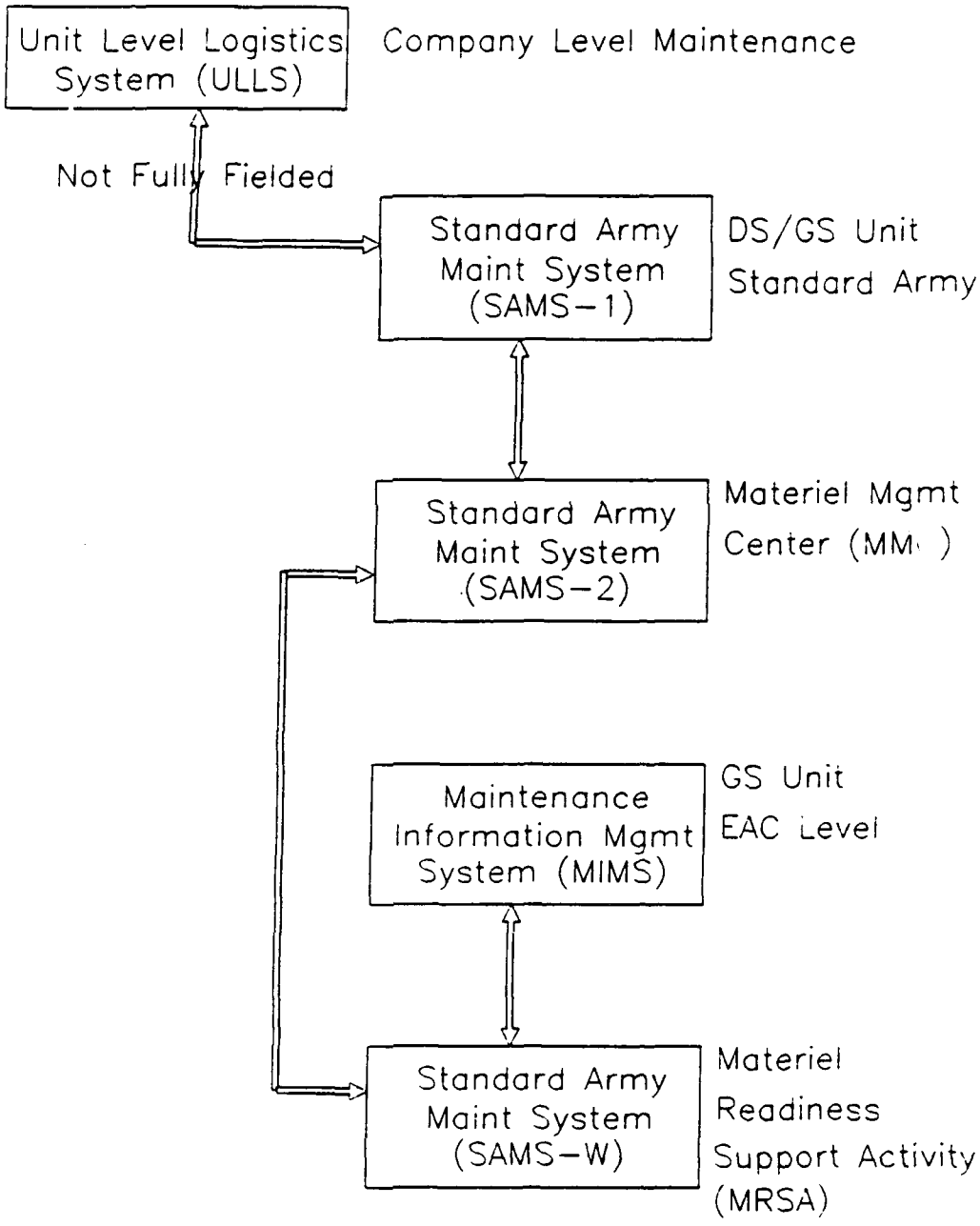
c. Personnel at the wholesale level should explore the capabilities of the SAMS-W system to determine which reports on IEW equipments could be provided using currently available automation equipment.

d. Special repair activity (SRA) contractors should be required to use SAMS-1. Use of a standard automation system within the SRA would allow military maintenance managers to analyze what is being accomplished in the SRAs and to prioritize maintenance within the SRAs.

e. A SAMS-2 capability for IEW equipment should be established at the EAC or theater level. Maintenance on a larger scale, based on information from the DS maintenance activities, GS IEW maintenance detachments, and SRAs, would allow managers to analyze and manage IEW equipment more proficiently.

Appendix A
Army Maintenance Automation Capabilities

Automation Capabilities FY 92



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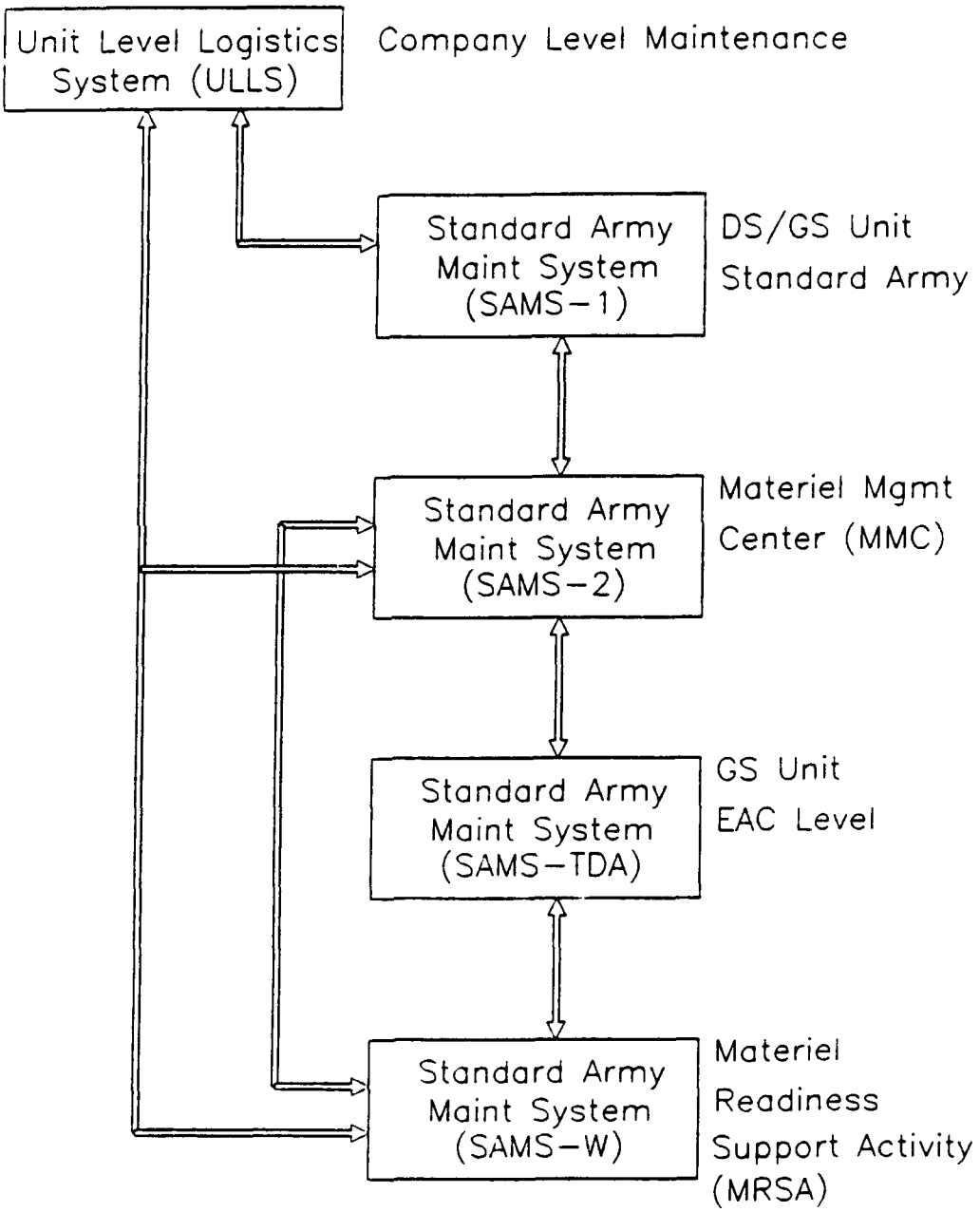
Automation Capabilities Incremental Update



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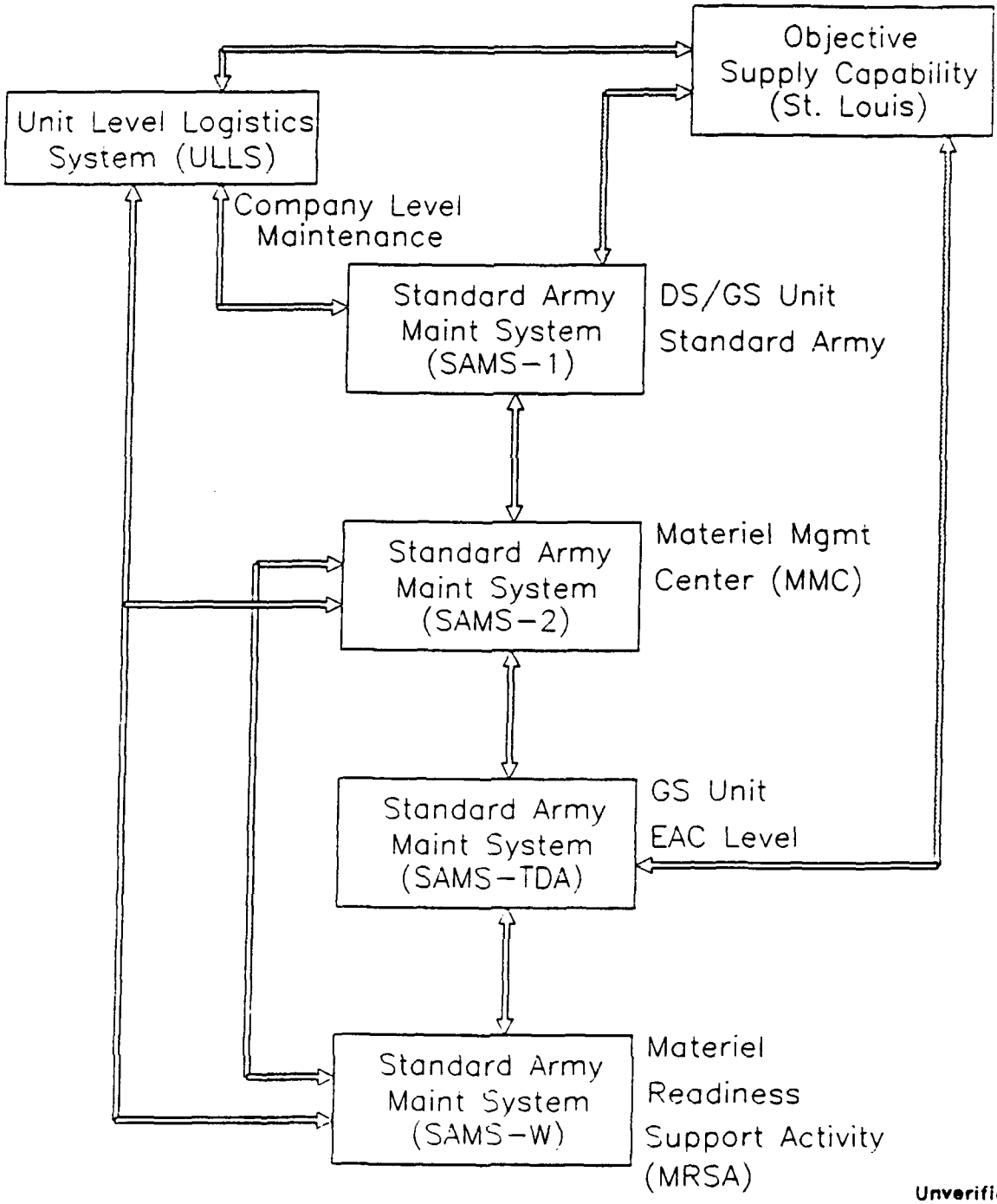
Automation Capabilities with Objective Supply Capability



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Appendix B
ULLS Menu Sheets

ULLS MAIN MENU	A
REQUEST PROCESS	A
RECEIPT/STATUS/DCR MGT	B
PLL MANAGEMENT	C
CATALOG MANAGEMENT	D
SYSTEM UTILITIES	F
OPERATIONAL PROCESSES	G
EQUIPMENT DATA UPDATE	H
EQUIPMENT DATA REPORTS	J
MAINTENANCE SUPPORT	K
REBUILD DATABASE	L
OSC PROCESSING	O
LOGOFF/EXIT SYSTEM	E

REQUEST PROCESS	1
REQUEST FOR ISSUE	1
POST POST REQUEST FOR ISSUE	2
QSS LISTING	3
COMMANDER'S EXCEPTION REPORT	4
REQUEST FOR CANCELLATION	5
REQUEST FOR FOLLOW-UP	6
REQUEST FOR MODIFICATION/DCR UPDATE	7
REQUEST FOR TURN-IN	8
EXIT REQUEST PROCESS	E

RECEIPT/DCR PROCESS	1
RECEIPT PROCESS	1
MANUAL STATUS PROCESS	2
AUTOMATED STATUS PROCESS	3
DCR INQUIRY	4
EXIT	E

PLL PROCESS	1
EXCESS MANAGEMENT	1
PLL INQUIRY	2
PLL INVENTORY	3
PLL ZERO BALANCE REPORT	4
PLL DEMAND ANALYSIS	5
ADD A PLL LINE	6
UPDATE A PLL LINE	7
DELETE A PLL LINE	8
EXIT PLL PROCESS	E

ULLS MAIN MENU	D
REQUEST PROCESS	A
RECEIPT/STATUS/DCR MGT	B
PLL MANAGEMENT	C
CATALOG MANAGEMENT	D
SYSTEM UTILITIES	F
OPERATIONAL PROCESSES	G
EQUIPMENT DATA UPDATE	H
EQUIPMENT DATA REPORTS	J
MAINTENANCE SUPPORT	K
REBUILD DATABASE	L
OSC PROCESSING	O
LOGOFF/EXIT SYSTEM	E

CATALOG PROCESS	1
CATALOG SCAN, ADD, DELETE OR PRINT	1
CATALOG LOAD/UPDATE BY DISKETTES	2
CATALOG LOAD/UPDATE BY 40 MEG	3
CATALOG LOAD/UPDATE BY 60 MEG	4
CATALOG X-REF FILE UPDATE/PRINT	5
MERGE USER CREATED LINES	6
EXIT CATALOG MAINTENANCE PROCESS	E

SYSTEM UTILITIES	1
UNIT PARAMETER ADD/UPDATE	1
INOP/DCR RECONCILIATION	2
PLL/DCR RECONCILIATION	3
SEND SUPPLY TRANSACTIONS TO SOS	4
FILES MAINTENANCE 40 MEG	5
FILES MAINTENANCE 60 MEG	6
FILES MAINTENANCE DISKETTE	7
EXIT SYSTEM UTILITIES	E

MAINTENANCE OPERATIONAL PROCESSES	1
EQUIPMENT DISPATCH AND RETURN	1
MAINTENANCE AND INSPECTION WORKSHEET	2
MAINTENANCE FAULTS	3
PARTS INSTALLED	4
SERVICES PERFORMED	5
ADD/DELETE OPERATOR	6
MODIFY OPERATOR RECORD	7
EXIT	E

ULLS MAIN MENU	H
REQUEST PROCESS	A
RECEIPT/STATUS/DCR MGT	B
PLL MANAGEMENT	C
CATALOG MANAGEMENT	D
SYSTEM UTILITIES	F
OPERATIONAL PROCESSES	G
EQUIPMENT DATA UPDATE	H
EQUIPMENT DATA REPORTS	J
MAINTENANCE SUPPORT	K
REBUILD DATABASE	L
OSC PROCESSING	O
LOGOFF/EXIT SYSTEM	E

EQUIPMENT DATA UPDATES	1
EQUIPMENT ADD	1
EQUIPMENT DATA FILE UPDATE	2
COMPONENT FILE UPDATE	3
EQUIPMENT SERVICE UPDATE	4
EQUIPMENT DELETE	5
EQUIPMENT CLASS CODES	6
EXIT	E

EQUIPMENT DATA REPORTS	1
OIL ANALYSIS REQUEST	1
EQUIPMENT AVAILABILITY	2
PARTS RECEIVED NOT INSTALLED	3
EQUIPMENT FUEL USAGE	4
SERVICE SCHEDULE	5
NON-MISSION CAPABLE	6
EQUIPMENT OPERATOR/CLASS CODE	7
EQUIPMENT PERIODIC USAGE	8
EQUIPMENT DATA FILE	9
EXIT PROCESS	E

MAINTENANCE SUPPORT FUNCTIONS	1
SEND SAMS TRANSACTIONS	1
MAINTENANCE REQUEST	2
MANUAL MAINT. STATUS UPDATE	3
AUTOMATED MAINT. STATUS UPDATE	4
MAINT. REQUEST REGISTER	5
AUTOMATED SAMS REV FILE UPDATE	6
EXIT PROCESS	E

Appendix C
SAMS-1 Menu Sheets

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
SAMS-1 Baseline 1.21-07-00	Maintenance	Parent WO/Task Intra-Shop WO/Task Tasks Parts AIIN-030 Close-Out WO AIIN-039 Inoperative	
	Supply	Receipts	Requisitioned Receipts Non-Requisitioned Receipts
		Shop Stock Bench Stock Transfer Parts Off Line Status Supply Transaction Recoverable/Excess Turn-In AIIN-030 Doc Register	
	Manpower	Update Work Days/ Manhours Manhour Accounting Personnel	
	Inquiry	Ad Hoc Inquiry Work Order Inquiry	
	Interface	To SAMS-2	Daily Inop Transfer Weekly WO Transfer AIIN-012 MH Acct Transfer AIIN-035 Write ECP-S
		From SAMS-2	Read Equipment Master File (EMF) Read ECP S
		To SSA Requisitioning AIIN-013/016	

SAMS-1 Master Menu (sheet 1 of 3).

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
		From SSA	Status Update AIIN 019 RPM Update AIIN 020 AIIN 037 NSN/UI Change AIIN 034
		From ULLS	Read ULLS WO/NOP Diskette Read ULLS AMSS Diskette
		To ULLS	Write ULLS Diskette Write ULLS AMSS Diskette
		Retransmit Comm	
	Supply Calculations/Purge	RO/ROP AIIN 014 Follow-Up AIIN 028 SSL Replenishments AIIN 015	
		SSL Inventory	Download to BCR BCR Upload to TACCS SSL Qty Adjustment AIIN 033 SSL Manual Inventory AIIN 032
		BSL Replenishments BSL Review AIIN 026/023 Purge Doc Register AIIN 010 Purge SSL Audit AIIN 017 Purge RPM	
	Reports	Maintenance Reports	WO Master AIIN 005 Shop Section Summary AIIN 006 WO Register Status AIIN 007 Customer WO Recon AIIN 004 WO Detail AIIN 018 Workable Jobs AIIN 001 Equipment Status AIIN 021 Prod/Backlog Status AIIN 022 Task Worksheet AIIN 038

SAMS-1 Master Menu (sheet 2 of 3).

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
		Supply Reports	Open Doc Register AIIN 008 Shop Stock List AIIN 002 Bench Stock List AIIN 023 Bench Stock Review AIIN 024 Parts Status Detail AIIN 011 SSI/WO Issue List AIIN 003 Closed Doc Register AIIN 009 Recoverable Items AIIN 031
		Manpower Reports	MH Acct Utilization AIIN 036 Pers Utilization by Assigned Labor Cd AIIN 040 Pers MH Exception AIIN 041
	Master Files	UIC Customer UIC Suppport UIC Parameters Equipment RPM Disk/Comm Parameters	
	Utilities	Backup Files Restore Files Compress/Cleanup Files	
		Print Labels	SSL Bin Labels AIIN 025 BSL Bin Labels AIIN 027 Diskette Labels
		UIC Support Change LOGMARS Utilities Initialize Tape Cartridge/Diskette	
Communications	MAP Monitor Install MAP Configure MAP Terminate MAP		
Computer System Status	Partition Status Spooler Status Baseline Versions AIIN-029 ECP S Status		
Logout			

SAMS-I Master Menu (sheet 3 of 3).

Appendix D
SAMS-2 Menu Sheets

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
SAMS-2 Baseline L26-07-00	Inquiry	Ad Hoc Inquiry Ad Hoc Form Gen Define User Files MUF Inquiry Open WO Inquiry Closed WO Inquiry		
	Inop Equipment 32	Inop Equip Add Inop Equip Mod Inop Equip Del Inop Spt/Evac Status Update Inop Parts Maint List/Correct Inop Trans Errors 33		
	Reports	Reportable Items	Weapon Systems A110-001 Summary A110-002 Over NNN Days A110-003 Over NNN Days by BN A110-026 Inop Equip Critical Parts Listing A110-016	
		Compl WO Summary A110-004		
		Workload	Selected Work Order Status Listing A110-009 Status- ECC I A110-010 I Status- Unit II A110-010 II Age- ECC I A110-011 I Age- Unit II A110-011 II	
		Work Order Parts	Parts Detail Exception A110-012 Multiple Parts Request Exception A110-013 Work Order Status/ Parts Listing A110-032	

SAMS-2 Master Menu (sheet 1 of 4).

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
		Maint Performance	TAT by Unit/Activity A110-005 Turn Around Time ECC A110-006 MTTR by Unit A110-007 Maint Meantime ECC A110-008 Maint Prod/Backlog A110-025 A110-029 Maint Prod/BL by ECC A110-030 A110-031 A110-033 A110-034 A110-035 A110-036 Prod/Backlog Status A110-014	
		Maint Cost	Command Rollup A110-019 Commodity A110-020 ECC A110-021 Customer A110-022 APC A110-023	
		Oper Readiness Float	Monthly Float Usage and Accumulative Report A110-039 A110-040 ORF Status and Utilization A110-041	
		Manhour Accounting	Manpower Utilization Report A110-044 Personnel Utilization Report A110-045	
	Input/Output 14	Diskette/Comm Transfer (IN/OUT) 15	Input Disk/Comm 17 Output Disk/Comm 18 UIIS Data Trans MSDOS/TACCS 19 Update Supported User Parameters 16	
		Input/Output Processes 20	Input Processes 21	Process Daily Insp Transfer 22 A110-037 Process Weekly WO Transfer 23 A110-024 Post Supply Status

SAMS-2 Master Menu (sheet 2 of 4).

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
			Output Processes 24	Supply Inquiry Produce Report Equip Val File 25 AHO 027
			Input/Output Related Processes 26	Print Disk Label 27 Print Disk/Comm Parameter Listing AHO 028 Prob Reporting Delete Control File Records 28
	Master Files 01	Lookup (AHO12I) 02 ECC (AHO13I) 03 UIC (AHO14I) 04 EMP (AHO15I) 05		
		ORF (AHO25I) 06	ORF File Maintenance 07 Update ORF Dmds 08 Purge ORF File 09	
		Purge CWO File AHO 018 Purge MUP AHO 046		
	File Utilities 10	Initialize Disk or Tape 11 Backup Files 12 Restore Files 13 Compress Files Print user Log Global UIC Mod/Del Set Print Mode		
	Help/Error Recovery			
Communications 29	MAP Monitor Start MAP Comm Set MAP Config 30 Terminate Map			

SAMS 2 Master Menu - (sheet 3 of 4).

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
Computer Sys Status	Partition Status Spooler Status Baseline Status A110-01(			
Sat TACCS Config 31				
Logout				

SAMS-2 Master Menu - (sheet 4 of 4).

Appendix E
Maintenance Publications Available for Review

Maintenance related publications available for review of the standard Army maintenance system included:

AR 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations
DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS)
FM 29-12, Division Maintenance Operations
FM 34-22, Military Intelligence Battalion Combat Electronic Warfare and Intelligence
FM 34-23, Military Intelligence Battalion (Tactical Exploitation)
FM 38-725, Direct Support System (DSS) & Air Line of Communications (ALOC)
FM 43-5, Unit Maintenance Operations
FM 43-11, Direct Support Maintenance Operations (Non-Divisional) Coordinating Draft
FM 43-12, Division Maintenance Operations
FM 43-20, General Support Maintenance Operations
FM 63-2, Combat Service Support Operations - Division
FM 63-3, Combat Service Support Operations - Corps
FM 63-5, Combat Service Support Operations - Theater Army
FM 750-80, Army Wholesale Maintenance Management
Report: Concept of Maintenance for Support of Tactical SIGINT/EW Systems (Post 1980)

ADSM-18-L3N-AWA-ZTH-EUM, Unit Level Logistics System End User Manual
AISM 18-L21-AHN-BUR-EM, Standard Army Maintenance System Level 1 (SAMS-1) End User Manual
AISM 18-L26-AHO-BUR-EM, Standard Army Maintenance System Level 2 (SAMS-2) End User Manual

Appendix AB

BDM Paper, undated, Subj: Maintenance Support Systems and Concepts Literature Review and Assessment

Task 3: Maintenance Support Systems and Concepts Literature Review and Assessment

1. *Introduction*

a. The Intelligence and Electronic Warfare (IEW) community, for a variety of funding, programmatic, and operational reasons, has developed specially tailored maintenance concepts and support processes for each type of system. Over the years, this approach has resulted in several cases where support procedures vary significantly from the standard Army processes. This condition has contributed to the perception that IEW systems should be supported in a nonstandard manner. In analyzing the current support procedures and systems as part of an effort to streamline support for IEW equipment, the study is also looking at how the Army intends to perform maintenance in the future. With the many changes that are occurring within the Army, a concerted effort is required to identify how these changes will impact on the IEW community's maintenance concepts.

b. This document will introduce several of the concepts currently being proposed by the Combined Arms Support Command (CASCOM), the Ordnance Center, the Strategic Logistics Agency (SLA), and the CECOM Intelligence Materiel Management Center (CIMMC). Concepts discussed include readiness-based maintenance, integrated sustainment maintenance, regional maintenance centers, division based maintenance, and the VXI Automated Test Measurement (ATM) equipment proposal.

2. *Readiness Based Maintenance*

a. The heart of the readiness based maintenance concept is a model for use by logisticians, based on a mathematical model called Distribution and Repair in Variable Environments (DRIVE). The goal of the mathematical model support concept is to maximize the probability that all units will meet their weapon system availability goals.

b. The DRIVE model includes information from many different sources including:

(1) Operational data indicating operating tempo of the units involved, the intensity and duration of any combat, the weapon system availability goal for each system, and the current force structure.

(2) Logistics data called for in the model includes the worldwide class IX asset data for both serviceable and unserviceable assets; failure factors for systems, line replaceable units (LRU), and other class IX assets; the distribution of maintenance tasks for each system; the repair

times for individual systems, LRUs, and other reparable assets; the order-ship times for the units and commodities involved; and other logistics variables.

(3) Data is also provided the DRIVE model from the Commodity Command Standard System (CCSS), the Standard Depot System, the Logistics Intelligence File (LIF), and the Total Asset Visibility file.

c. The goal of the DRIVE model is to determine which equipment and reparable items need repair and where to send the available class IX assets. Readiness Based Maintenance is a proactive program that will push repair components to units rather than wait for units to decide they need the assets.

d. The impact of the Readiness Based Maintenance concept on IEW systems support is not fully understood at this time. The fact that CIMMC is not using CCSS will have a yet to be determined impact on the model.

e. If Readiness Based Maintenance is to provide responsive support to the Army without the burden of additional programs and equipment, it will need to be incorporated into the Standard Army Maintenance System (SAMS).

3. *Integrated Sustainment Maintenance (ISM)*

a. The ISM concept concerns maintenance above the direct support (DS) level that is primarily in a sustaining role, repairing equipment for reissue to combat units or for supply system stockage. Combat repair and forward maintenance support are not parts of the ISM concept. One of the key parts of the ISM concept is the appointment of an integrated sustainment maintenance manager (ISMM) who takes responsibility for maintenance at all levels above direct support. The ISMM is responsible for the command and control of the ISM organization and for sustainment maintenance. Sustainment maintenance is defined as--

(1) maintenance done at echelons above direct support

(2) maintenance performed by Active Army general support units, Reserve Component general support units, installation Directorates of Logistics (DOL), depots, and contractors at all levels

(3) maintenance accomplished in-theater at a government or contractor's facility

b. The ISMM is the key to the ISM concept and is responsible for the success or failure of the entire process. The ISMM's responsibilities include the following:

(1) Providing all sustainment maintenance capabilities required by field units (As such the ISMM will be the focal point for the field commander to obtain sustainment maintenance.)

(2) Controlling all personnel, equipment, and facilities required to carry out the sustainment maintenance mission

(3) Taking the lead for Reserve Component training and mission assignments (The ISMM has a key role in the training, assignment, and mobilization of Reserve Component sustainment maintenance units.)

(4) Building support packages based on sustainment requirements to meet the needs specified by weapons system managers in the field

(5) Being the maintenance advocate in the concurrent engineering process for new equipment and having a key role in ILS planning for new systems

c. The need for an integrated concept was identified very quickly during Operation Desert Shield/Desert Storm. The wide variety of support activities, support contractors, and transportation capabilities, along with the difficulties of integrating the active and reserve force, pointed out the need for a concept that would place all sustainment maintenance under a single umbrella.

d. The ISM concept will impact IEW maintenance above the direct support level, although how much actual impact it will have is unknown at present. If the concept is fully implemented, it could cause the following changes:

(1) Control of depot maintenance at CIMMC would pass to the ISMM

(2) Control and tasking of the SRA contractor would pass to the ISMM

(3) The ISMM would provide input to the ILS planning process

(4) Readiness support for field units would be provided by the ISMM

(5) Logically, readiness responsibilities would transfer to the ISMM also

(6) Much of the support currently provided by CIMMC could fall under the ISMM umbrella

(a) CIMMC functions would be reallocated.

(b) All field support resources would fall under the ISMM, with CIMMC retaining support for the program managers.

e. There are many political and practical obstacles to be overcome for the ISM concept to be implemented. The concepts need to be studied in more detail once specifics of the concepts are released. Regardless of how or if the ISM concept is implemented, the good ideas included in the concept could be adapted to IEW maintenance on a commodity basis.

f. Recommendation: Based on the review of the ISM concept, consideration should be given to establishing a single manager of sustainment maintenance for all IEW equipment. A single manager would be a major step toward streamlining support for the field. If this course of action is selected, current support for IEW could be consolidated along the lines of the ISM concept. Properly executed, this step could improve command and control of IEW maintenance assets and increase readiness for the field. Prior to proceeding further, a cost analysis should be accomplished to identify possible cost penalties or savings that could result from the change. As in the Army-wide program to implement an ISMM, movement to a single manager for IEW maintenance support would be faced with a series of obstacles.

4. *VXI Automated Test Equipment*

a. The VXI automated test equipment project at USACIMMC is a Quick Reaction Capability (QRC) program to provide contract SRAs with a go-to-war capability that does not require 40-foot trailers and the deployment of all test equipment and hot mockups from the home work site. The QRC capability will give SRAs the capability to provide the same support in a deployed situation that the home-based SRA can provided, allowing both facilities to be fully functional at the same time.

b. The initiative developed from Desert Shield/Desert Storm during which the SRAs were required to deploy to SWA with all of their test equipment and hot-mockups. Deploying test equipment and hot-mockups effectively stopped all repair at the home station SRA, making support for non-deployed units difficult.

c. Another solution provided by the QRC VXI equipment is based on the lack of standards for production contractor test sets. The use of IFTE (Integrated Family of Test Equipment) commercial equivalent equipment for production testing is

normally not cost effective for low density systems. On the other hand, using VXI equipment provides major benefits as follows:

(1) The SRA would not be forced to procure test equipment and software developed by the production contractor. The contractor would use VXI ATM equipment to develop and verify test programs. The government could then provide the test equipment to the SRAs as the equipment is fielded.

(2) VXI ATM equipment provides a go-to-war capability for the SRA. During the war in SWA, the contractor's SRAs deployed, but lacked in-country mobility. This equipment will provide the capability to deploy and provide responsive support to a theater of war without decreasing capabilities at the home station.

(3) VXI equipment could provide direct support units the capability to troubleshoot LRUs to the circuit card assembly (CCA) level for all fielded IEW systems. With the advent of stock funding for depot level reparables, the units should be able to isolate problems to the lowest level possible. VXI equipment will allow units to isolate faults to a lower level than possible today and to request only that component required to restore a system to operation. This capability will help units conserve funds allocated for reparables.

d. Recommendation: If the QRC VXI equipment provides the required capabilities, the U.S. Army should consider fielding the equipment to the direct support level within the MI battalion. The equipment will be in an Army standard vehicle with power and environmental systems similar to other IEW systems. Units could use this capability to troubleshoot to the CCA level and to requisition the lowest level reparable, thereby decreasing the units' operating budget requirements.

5. *Regional Maintenance Centers*

a. Regional maintenance centers (RMC) are integral to the ISM concept discussed in paragraph 3. Consolidating maintenance support into regionally based centers provides support on a geographical basis to general support units, contractors, government civilians, depot employees, and other sustainment maintenance activities.

b. The RMC would provide training positions for Active Army general support units and rotational training assignments for Army Reserve and National Guard general support units.

c. Technical support to direct support and lower level units would be provided along with repair of GS and selected depot reparables. Critical to the effectiveness of the concept

is the ability to quickly and accurately move reparables from the RMCs to Army and other units being supported. A responsive transportation link is required which could include aircraft and ground transportation. Transportation could be provided by civilian firms in peacetime and by dedicated transportation units in time of war.

d. Deployment of RMCs raises concerns similar to those related to the SRAs. If most of an RMC's capability deploys to support a wartime mission, supported units in the geographical area that do not deploy could lose their GS maintenance support.

6. *Division Based Maintenance*

a. Little information is available at CIMMC on the Division Based Maintenance concept. Apparently the concept is part of a CASCOM initiative concerning the restructuring of divisional light maintenance companies.

b. A request for information on this concept is being submitted to CASCOM. An expansion of the light maintenance company mission within the division could include direct support maintenance capabilities of the MI battalion, a condition that would have to be accommodated in the IEW maintenance streamlining initiative.

7. *Recommendations for Additional Concepts to be Reviewed*

a. The following concepts and programs should be reviewed for their impact on the IEW Sustainment Streamlining Study:

(1) Battlefield Maintenance System. Although this maintenance concept is probably not going to be implemented in the U.S. Army, it may have some good points that can be incorporated with the IEW maintenance support structure.

(2) Forward Repair Activity (FRA). The FRA concept is currently being reviewed for inclusion in the study.

(3) Logistics Support Group. The logistics support group concept is built on AMC's experience during Desert Shield/Desert Storm and is very similar to the FRA concept, although there are a few differences. The concept could have a significant impact on IEW sustainment during wartime.

b. Currently several supply concepts are in the process of being implemented or are under study. The impact of these concepts on IEW sustainment should be reviewed periodically.

8. *Overall Recommendations*

a. The concepts reviewed in this report continue to emerge and be refined. Each should be monitored to determine its potential impact on IEW maintenance processes and procedures, to recognize opportunities to contribute to the staffing process as these concepts mature, and to build a library of information on each.

b. Ideas contained in some of the concepts could have immediate application to the existing IEW maintenance system. Areas promising improved capabilities and better responsiveness should be incorporated into the IEW Sustainment Streamlining Study.

Appendix A
Document Extracts

SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: Readiness-Based Maintenance Document Extract

1. The following points are extracted from an article submitted by Cecilia Butler, a logistics management specialist for SLA, to the *Army Logistician*. The title of the article is "Readiness-Based Maintenance."

2. The Readiness-Based Maintenance concept was developed by the RAND Corporation's Arroyo Center and is based on a mathematical model called, distribution and repair in variable environments (DRIVE). The object of the mathematical model is to maximize the probability that all units will meet their weapon system availability goals at the end of the planning period. The concept is that, when fully tested, DRIVE will provide logisticians with a decision-support tool that can prioritize repair requirements and enable logisticians to make the best use of maintenance resources.

3. The DRIVE model includes the following types of information:

a. Operational data including operating tempo, intensity and duration of combat, weapon system availability goals, and force structure

b. Logistics data including worldwide Class IX asset data, failure factors, distribution of maintenance tasks, repair times, order-ship times, and other variables

c. Data being input from the Commodity Command Standard System (CCSS), Standard Depot System (SDS), Logistics Intelligence File (LIF), and Total Asset Visibility (TAV) file.

4. Based on the data DRIVE produces a short-term list of what to fix and where to send Class IX assets.

5. Early test results indicate that the quality of the data being input to the model needs improvement.

6. A key to readiness-based maintenance is that DRIVE is proactive rather than reactive.

7. A test of readiness-based maintenance was conducted in 1991 on MLRS. A corps or division materiel management center test is planned for April to September 1992.

8. Recommendation: If readiness-based maintenance becomes a viable capability, it needs to be incorporated into the Standard Army Maintenance System (SAMS) to allow its use without additional equipment and programs proliferating on the battlefield.

SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: Integrated Sustainment Maintenance Document Extract

1. The following points are extracts from a document from DCSLOG on "Integrated Sustainment Maintenance Concept."

2. Sustainment maintenance was defined as all maintenance above the direct support level, including contractors, military, installations, depots, and SRAs. The article also identified the need for a sustaining maintenance system that can respond rapidly to a full range of combat missions from high intensity conflict to contingency operations such as Grenada and Panama.

3. Desert Shield/Storm identified gaps between the current maintenance system and needs of the future. Some of the major challenges identified included:

a. The obstacles presented by the many parallel management chains involved in sustainment maintenance

b. The difficulties inherent in integrating a combination of Active, Reserve Component, government civilian, and contractor maintenance resources

c. The gaps between the supply, maintenance, and transportation systems and the communications and automation systems that are supposed to link them together

d. The lack of a rapidly deployable sustaining maintenance capability

e. The fact that, although the Reserve Components (RC) supply much of the sustainment base for a wartime effort, RC maintenance units are generally not able to maintain frontline combat systems because the systems have not been fielded to the Reserve Components (These types of mission mismatches occurred with both Active and RC GS units, but more often with RC units.)

4. Evolving Army sustainment doctrine calls for a flexible, responsive maintenance system providing the following support:

a. Combat repairs (i.e., those repairs that can be made quickly by maintenance personnel in the battle zone)

b. Forward maintenance support in the division area (i.e., those repairs required to repair broken or battle damaged equipment and return it to the combat unit)

c. Sustaining maintenance (i.e., the capability to support reconstitution by repairing end items, Shop Replaceable Units, and Line Replaceable Units and returning them to front line units, or by making major repairs equivalent to overhaul to feed the supply pipeline. These activities can be conducted in the

logistics areas within the combat theater or at fixed installations outside the theater of operations.)

5. Key elements of the Integrated Sustainment Maintenance concept are as follows:

a. An Integrated Sustainment Maintenance Manager (ISMM) will provide a unified command and control structure.

(1) The ISMM will be responsible for providing all sustainment maintenance capabilities required by field units. As such the ISMM will be the focal point for the field commander to obtain sustainment maintenance.

(2) The ISMM will control all of the personnel, equipment, and facilities required to carry out the sustaining maintenance mission.

(3) The ISMM will take the lead for RC training and mission assignments.

(4) The ISMM will build support packages based on sustainment requirements to meet the needs specified by weapons system managers in the field.

(5) The ISMM will be the maintenance advocate in the concurrent engineering process for new equipment and will have a key role in ILS planning for new systems.

b. The ISMM will report to the AMC Commander although the ISMM could be integrated with the proposed Industrial Operations Command.

c. The ISMM will provide the following to the RC:

(1) The ISMM will determine which RC sustainment maintenance capabilities are needed to support operations.

(2) The ISMM will originate mobilization requests for RC sustainment maintenance units.

(3) The ISMM will be responsible for training and recommending mission assignments and equipment allocations for RC sustainment maintenance units.

6. Key problems facing implementation of the ISM concept are as follows:

a. Creation of a management infrastructure containing the right mix of management positions with the appropriate civilian grades and officer ranks. The trade-offs for creation of this infrastructure were not identified in the document.

b. Management of GS resources assigned at the corps level is not specifically addressed.

c. A mechanism to establish direct linkage with the RC needs to be developed for the ISMM.

d. Putting all of the depots and contractor resources under one management system may change the current mix of these resources in the sustaining maintenance forces.

e. Many political obstacles will have to be overcome to implement the ISM concept.

f. Financial and accounting implications will need to be worked out to control and allocate sustaining maintenance costs among customers.

7. The above problem areas are but some of the hurdles facing the ISM concept. In addition, at least one of the key implementing ideas in ISM, forward repair activities, is in for a real struggle because the AMC commodity commands may be reluctant to give up control of their assets.

8. Recommendation: The ISM and ISMM concepts have some very good points behind them, but the implementation of the concept needs to be closely studied.

SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: VXI ATM Initiative Document Extract

1. The following points are extracts from a briefing package and discussions with Mr. Wright on the USACIMMC ATM Initiative that proposes the use of the Army standard contact test set (CTS III) with a VXI expansion chassis as a Quick Reaction Capability (QRC) for the USACIMMC field support SRAs. In the long run the VXI ATM equipment could be used for both production testing and SRA testing and troubleshooting.

2. The initiative was to develop a reconfigurable test set using the Army standard CTS II computer with VXI expansion chassis to provide the SRAs with a transportable test capability that can provide full testing of IEW reparables. The capability provides a go-to-war capability, along with exercise support.

3. The initiative developed from Desert Shield/Desert Storm when the SRAs were required to deploy to SWA with all of their test equipment and hot mock-ups to support deployed equipment. The removal of all the test equipment and hot mock-ups effectively stopped all repair at the home station SRA during the deployment, making support for non-deployed units difficult. An additional solution provided by the QRC VXI equipment is a solution for the lack of standards for production contractor test sets. The use of IFTE commercial equivalent equipment for production testing is not cost effective for low density systems, and the use of the VXI ATM equipment for production testing provides many benefits. There had been no way to make the equipment and software developed by production contractors available for the SRA contractors without purchasing a multitude of unique sets of equipment.

4. Future advantages of VXI ATM equipment:

a. SRA contractors will have a deployable testing capability that will permit leaving other test equipment and hot mock-ups in garrison upon deployment.

b. VXI equipment can be provided to the production contractor as GFE and can then be used to develop ATE programs for production testing instead of using unique equipment. These ATE programs can then be immediately exported to the field for use by the SRA.

c. The VXI expansion chassis can be used for both ATE and as common TMDE by the SRA.

d. Since IFTE will not be used within the IEW field, the electronic technical manuals will be available through the VXI ATM equipment.

e. VXI open architecture enables expansion and adaptation to meet new requirements. These requirements would include new

tactical and strategic systems including any systems where the testing and troubleshooting equipment becomes obsolete or unavailable.

f. VXI capabilities to emulate the AN/USM-465 allow migration and reuse of the existing inventory of AN/USM-465 test sets.

g. The small size of the equipment allows for easy transportation and movement to wherever it might be needed.

h. The VXI ATM equipment will incorporate the CTS II standard IFTE computer into the configuration. This combination provides some commonality with the IFTE and uses an Army standard computer system.

i. Since the system is primarily NDI, repair and replacement of circuit cards can be done commercially.

j. The VXI ATM equipment will be maintainable through self testing and verification of operation.

5. Disadvantages of VXI ATM equipment

a. With the fielding of the HMMWV VXI sets, the SRAs may decrease use of current TMDE and hot mockups. Over the long run, SRAs may lose the capability to perform their functions if the VXI set is deployed.

b. The VXI ATM equipment is not replacing any equipment in the field, only supplementing current capabilities. Additional personnel may be needed to support the equipment and vehicle in the SRA.

c. The VXI ATM equipment is duplicating the mission of IFTE at the GS level, although at a smaller cost and with a much faster development cycle.

d. The VXI ATM equipment is duplicating the electronic manual capability of IFTE. Compatibility with IFTE has not been assured potentially leading to future problems.

6. Conclusions

a. The VXI ATM equipment initiative is an excellent idea that provides a QRC capability for the SRAs, even though it duplicates some of the plans for IFTE. A key to the VXI ATM equipment is where it is used and to what degree. With the advent of stock funding of depot level reparables, units will want to isolate problems to the lowest level possible. This capability will allow units to minimize expenditures for reparables. The VXI ATM equipment will allow units to isolate to a much lower level than possible today. The problem is that this equipment will not be fielded to the unit level. This problem must be corrected if VXI ATM equipment is to be of maximum benefit to the Army.

b. The VXI ATM equipment will provide real benefits in the equipment development cycle. A standardized test module that production contractors are required to use will greatly enhance commonality of testing and exportability of test programs. Production contractors are paid to develop tests to prove their equipment works. Exportability of the developed tests allows users to have a verified set of tests to use immediately after production acceptance.

c. The ability of the VXI ATM equipment to emulate the AN/USM-465 allows the SRAs and depots to migrate this testing from the older AN/USM-465 to the newer VXI equipment.

SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: CSS for AirLand Operations Document Extract

1. The following points are extracted from the "CSS for AirLand Operations" article by MAJ Pilgrim and MAJ Fehn published in *Army Logistician*, Feb-Mar 1992.

a. In the future it will no longer be economically sound for each maneuver unit to have its own "pile" of class IX repair parts.

b. Data from the Army Audit Agency shows that unit maintenance is less efficient than required. The data also indicated the demand accommodation rate for PLL items is much lower than that for authorized stockage list (ASL) items.

c. A dynamic distribution system is needed that will effectively manage our scarce transportation assets and provide for distribution to divisional weapon systems.

d. At the brigade level, logistics needs to be centrally managed from the forward support battalions (FSB).

e. Elements of the FSB will perform field maintenance from organizational level through DS level.

f. Corps logistics will be characterized by the ability to tailor support packages.

g. It will become inordinately difficult to provide a permanent relationship between the corps support battalion and its customers.

h. Within the maneuver brigades, coordination and synchronization of field services support will be made through the FSBs to the corps support group supporting them.

i. In the future corps transportation assets will routinely distribute supplies to subordinate units.

j. Within the division the DISCOM will remain the focus for logistics sustainment. The FSB will centrally manage truck assets and class IX repair parts. They will stock only combat-critical repair items. Items too bulky to be easily transported and those required in low densities will be pushed forward as needed.

Appendix B
Maintenance Publications and Articles Available for Review

Maintenance related publications available for review of the standard Army maintenance system included:

AR 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations
DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS)
FM 29-12, Division Maintenance Operations
FM 34-22, Military Intelligence Battalion Combat Electronic Warfare and Intelligence
FM 34-23, Military Intelligence Battalion (Tactical Exploitation)
FM 38-725, Direct Support System (DSS) & Air Line of Communications (ALOC)
FM 43-5, Unit Maintenance Operations
FM 43-11, Direct Support Maintenance Operations (Non-Divisional) Coordinating Draft
FM 43-12, Division Maintenance Operations
FM 43-20, General Support Maintenance Operations
FM 63-2, Combat Service Support Operations - Division
FM 63-3, Combat Service Support Operations - Corps
FM 63-5, Combat Service Support Operations - Theater Army
FM 750-80, Army Wholesale Maintenance Management
Report: Concept of Maintenance for Support of Tactical SIGINT/EW Systems (Post 1980)

ADSM-18-L3N-AWA-ZTH-EUM, Unit Level Logistics System End User Manual
AISM 18-L21-AHN-BUR-EM, Standard Army Maintenance System Level 1 (SAMS-1) End User Manual
AISM 18-L26-AHO-BUR-EM, Standard Army Maintenance System Level 2 (SAMS-2) End User Manual

Articles and briefings available for review on the various subjects included:

ATM Initiative briefing, USACIMMC Maintenance and Supply Directorate, Automated Test Measurement Division

Concept for Integrated Sustainment Maintenance briefing, DCS Logistics office, presented 27 Mar 1992

Integrated Sustainment Maintenance (ISM) point paper, Samuel Livecchi, dated 9 Mar 1992

Operations Branch trip report, Subject: Integrated Sustainment Maintenance (ISM) and Forward Repair Activity (FRA) Meeting, William A. Jackson, dated 31 Mar 1992

Integrated Sustainment Maintenance concept paper, U.S. Army Deputy Chief of Staff for Logistics, Director of Supply and Maintenance, Strategic Logistics Agency

Article, "Readiness-Based Maintenance," by Cecilia B. Butler, *Army Logistician*, Nov-Dec 1991, page 6

Article, "CSS for AirLand Operations," by Major Calvin Pilgrim and Captain Michael Fehn, *Army Logistician*, Mar-Apr 1992, page 2

Appendix AC

BDM Paper, undated, Subj: Maintenance MOS Training and Issues - Series 33T Literature Review and Assessment

Task 4: Maintenance MOS Training and Issues - Series 33T Literature Review and Assessment

1. *Introduction*

a. Career management field (CMF) 33 includes the military occupational specialties (MOS) for Intelligence and Electronic Warfare equipment maintenance. CMF 33 includes the tactical IEW equipment repairer (MOS 33T), the strategic IEW equipment repairer, and the avionics IEW equipment repairer. The Training and Doctrine Command (TRADOC) became responsible for the training of 33T personnel beginning in 1976, assuming responsibility for the training from INSCOM in that year.

b. The 33T series MOS has been combined at various times with the other MOSs and separated into various different MOSs at other times; but the 33 CMF has always encompassed the personnel who repaired IEW equipment at the organizational (ORG) and direct support (DS) levels. Training for the MOSs has varied from 25 weeks to 49 weeks over the last twenty years, with the training course currently at 32 weeks and 1 day.

c. The TRADOC philosophy for training the MOS has varied over the years, sometimes including specific equipment as part of the training, and sometimes making the training equipment-independent. When the training has been equipment-independent, units have been expected to provide on-the-job training (OJT) for the specific systems within the unit. TRADOC has never been able to train repair personnel on all possible systems they might encounter in a field environment.

d. The 33T is assigned primarily to the following units: the divisional Military Intelligence (MI) battalions, the armored cavalry regiments, the corps MI battalions, general support (GS) IEW detachments, and a few Special Operations units. Soldier-repairers can be assigned to other units; however, the 33T has traditionally not been assigned to QUICKFIX units, GUARDRAIL units, QUICKLOOK units, the CEFIRM LEADER unit, or to avionics units. The 33T is primarily oriented on and trained on ground IEW systems.

2. *MOS 33T Impact and Responsibilities at the Unit Level*

a. The 33T is the primary electronic maintenance repairer at the unit, both ORG and DS, level. The 33T accomplishes all maintenance of IEW equipment above the crew level, including organizational preventive maintenance checks and services (PMCS), fault diagnosis of equipment in the field and in the maintenance shop, and the repair of equipment. The 33T is typically the electronic MOS in the battalion with the highest degree of skill in electronics and, as such, is often called upon to repair electronic systems outside the 33T area in addition to IEW equipment.

b. Although the unit level includes both ORG and DS repair, the 33T performing maintenance rarely distinguishes between the two levels. With the available test, measurement, and diagnostic equipment (TMDE) and manuals, the 33T will diagnosis the fault to the lowest replaceable unit and replace the failed item or the next higher assembly.

Although possessing the capability to repair to the component level, the 33T will frequently replace the black box or line replaceable unit (LRU) in order to bring the system to operational status in the shortest possible time when mission requirements dictate.

c. The 33T's skills permit use in a task-organized contact team deployed in direct support of systems within the forward deployed companies. The 33T can also be deployed to the battalion trains area in support of battalion systems when required. Of the current systems deployed in an MI battalion, only one requires some of the maintenance to be done at a site away from the equipment. Most systems are designed to permit the replacement of LRUs, which are then evacuated to the next higher level of supply for replacement. The AN/TSQ-138 is the exception. Five of the AN/TSQ-138 unique LRUs are diagnosed at the system; then the defective LRU is diagnosed to the circuit card assembly (CCA) level in the battalion trains area by the repairer using issued TMDE.

3. *MOS 33T Impact and Responsibilities at the General Support Level*

a. The 33T at the GS detachment performs a much different role than the repairer within the 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 IEW detachments providing support to tactical systems. Several of the detachments are supporting nondevelopmental item (NDI) systems.

b. 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, the 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 learning cycle. Experienced repairers with NCO leadership training have the skills required to provide the needed OJT and must take time from the mission to train less skilled personnel.

c. Currently the GS detachments are each organized differently and each support different equipment. The equipment mix supported by the detachment is based on fielded developmental and NDI systems within the supported command. Additionally, a contractor-run special repair activity (SRA) is located with each GS detachment to support systems that have not fully transitioned to organic repair at the GS level of support. The combination of varying equipment mixes and contractor support requires the GS detachment 33T to be a versatile, well trained maintainer.

4. *The Future for the 33T MOS*

a. With the downsizing of the Army and the attendant reduction in the number of 33T positions, a serious analysis of future 33T requirements appears in order. Based on the consolidation and downsizing of the Army, PERSCOM figures indicate CMF 33 will be

reduced by 25 percent over the next three years. With a reduced number of 33T available to support the mix of IEW equipment, training requirements will become even more critical.

b. Another major impact on the 33T MOS will begin in the FY 95 to FY 98 timeframe as the IEW Common Sensor family of systems is fielded. These advanced systems will incorporate extensive built-in test/built-in test equipment (BIT/BITE), allowing the operator to diagnosis failures to the CCA level, and to replace a majority of these circuit cards. This fix forward capability inherent with these high technology systems will decrease the requirements for 33Ts at the unit level and change the skills required at each level of maintenance.

c. Several systems are being transitioned over the next several years to 33T support at both the unit and GS detachment level. This action will require training on these systems for both the unit and the GS level repairers. Currently, the CECOM Intelligence Materiel Management Center (CIMMC) is considering the transition of several systems, currently maintained by contractors at the GS level, to the 33T at the GS detachment. This transition will generate increased workloads at the GS detachment at a time when many of the detachments are downsizing or being eliminated, thus raising another supportability issue.

5. *MOS Consolidation of the 33 CMF*

a. The U.S. Army Intelligence Center and School (USAIC&S) has recommended a consolidation of the various CMF 33 MOSs into one MOS. This concept has been implemented before and was eventually changed because of a belief that the field would be better served by splitting the career field into strategic, tactical, and avionics MOSs. At present one of the major reasons USAIC&S supports consolidation is that the strategic 33 MOS, 33Y, is being decreased by 48 percent over the next three years. Combined with the cut in 33T and 33R authorizations, the 33 CMF as a whole will be decreased by 28 percent. This decrease in authorizations will result in a decrease in the total number of students trained each year.

b. USAIC&S included several reasons for consolidating the 33 CMF as stated in the Memorandum in Appendix A, page A-3. A review of the USAIC&S position, along with a review of benefits of maintaining separate 33T disciplines, appears to be necessary before making the consolidation decision.

c. Current consolidation plans would result in future 33Ts being trained as generic repairers. This action would probably require annex courses be provided to soldiers based on their duty assignments. The Army personnel management system would have the additional challenge of ensuring that the specially trained soldiers were assigned to the correct unit, a difficult task given the ever changing needs of Army units.

6. *Requirements for the Repairer of the Future*

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

(1) Common soldier skills to allow the repairer to survive on the battlefield.

(2) A basic electronics background that prepares the repairer for non-system-specific diagnosis of electronic failures and system failures. A strong electronics background allows the repairer to apply training received on one specific system to other systems.

(3) System-specific training at a level higher than that provided the system operator. Although the operator of the future may be using BIT/BITE to diagnosis and replace certain CCAs within the system, the repairer will need to be trained to this level and beyond. Experience has shown that, although 50-75 percent of all failures can be diagnosed with BIT/BITE and conventional troubleshooting techniques, the abilities of the electronic repairer are required to carry the diagnostic and repair processes to the point required to ensure high operational ready rates.

b. 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 required but is not the optimum solution.

7. *Training Problems*

a. Training on current systems has identified several problem areas that should be addressed for future systems. When new systems are fielded, a core of repairers is trained by the New Equipment Training (NET) team. These trained repairers then train the rest of the unit repairers and all repairers assigned in the future until the TRADOC training base begins training the system. The technical information passed on from NET trainer to repairer, and from senior to junior repairers is an effective approach only if the training base provides trained replacements before the NET-trained personnel depart the unit. After the NET-trained repairers depart the unit, technical proficiency will rapidly diminish.

b. 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 obtain. In addition, the training package provided by the NET team is based on requirements as viewed prior to fielding. Follow-on, exportable training packages generated by TRADOC would incorporate updates and corrections.

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

d. Training to the GS level of maintenance on IEW systems exists only for TRAFFICJAM. During development GS-level training tasks were identified for each system; however, GS-level training for the other IEW systems has not been fully implemented.

8. *Recommendations*

a. Do not combine all CMF 33 personnel into one generic MOS. Such action would eliminate system-specific training and would require repairers to receive extensive OJT at the unit level.

b. Provide exportable training packages for all MOS-peculiar equipment. This action will improve the 33Ts' skills from a common base, thereby improving the effectiveness of unit level OJT.

c. Determine the requirements of the GS IEW maintenance detachments and incorporate that training into BNCOC. Personnel assigned to the GS IEW maintenance detachments should receive GS-level training prior to being assigned to the unit.

d. Consider transferring some 33Y strategic technicians to the 33T field for assignment to the GS detachments. With the drawdown of the 33Y MOS during the FY 93 timeframe, there should be 33Y personnel available. The 33Y is experienced in piece part repair and could be put to excellent use in the GS detachments.

Appendix A
Document Extracts

SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: CMF 33 Future Projections/Concerns Briefing Review

1. The information in this MFR is extracted from a PERSCOM briefing to soldiers at Ft. Meade, MD, in March, 1992, dealing with the future of the 33 CMF. Specifics of the briefing included current and projected authorizations, current and projected operating strengths, issues with each of the MOSs, and specifics of the 33Y (strategic) retraining and reclassification efforts.

2. Projections for each of the MOSs are shown in the table below:

	FY 91	FY 92	FY 93	FY 94	FY 95
33R Authorization	282	251	233	225	191
33R Strength	253	216	212	210	202
33T Authorization	540	454	450	420	400
33T Strength	550	465	415	391	458
33V Authorization	107	103	106	78	226
33V Strength	106	99	91	81	86
33Y Authorization	724	671	398	376	374
33Y Strength	781	684	604	540	481
33Z Authorization	43	40	36	34	35
33Z Strength	42	29	32	31	30
33 CMF Auth.	1,696	1,519	1,223	1,133	1,226
33 CMF Strength	1,732	1,493	1,354	1,253	1,257

3. The 33Y authorizations fall dramatically in the FY 93 timeframe and many of the 33Ys in the field will be offered retraining and reclassification into one of five other MOSs.

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SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: Review of 33T MOS Restructuring Decision Brief Paper

1. The decision brief addresses a need to consolidate the strategic, avionics, and tactical portions of the 33 CMF into one MOS. This MOS would then be trained in generic electronic theory and avoid equipment-specific training.

2. The recommendation is basically a return to the status of the MOS in the early 1980's when all 33 CMF personnel were officially 33S. This situation was changed in the early 1980's into five separate MOSs, 33T, 33R, 33P, 33M, and 33Q, to provide personnel trained and capable of repairing specific systems. The feeling at the time was that entry level personnel needed some system-specific training. Reasons cited for restructuring the 33 CMF include--

a. a high percentage of the MI electronic equipment is becoming similar in configuration and technology, including the Ground Based Common Sensor systems, the GUARDRAIL Common Sensor system, Sun work stations, ETUT, and THMT

b. recruitment and personnel management would be simplified

c. training requirements would be reduced to one AIT course and one BNCOC course

d. assignments would be diversified

e. duty position titles and grade authorizations would be standardized and simplified

3. The recommendation to consolidate all MOSs eliminates the requirement to train specific systems, putting entry level personnel at a distinct disadvantage during their first tour and relying entirely on the field to train these personnel on specific systems. Field training or OJT has consistently been shown to be a difficult task in the field and would not be expected to produce the quality of personnel required. In addition the strategic equipment repaired by the 33Y is entirely different than the tactical equipment repaired by the 33T and 33R. A case can be made for combining the 33R and 33T MOSs, but the 33Y should not be combined into any other MOS.

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SELIM-IEW (700)

MEMORANDUM FOR RECORD

SUBJECT: 33T Electronic Warfare/Intercept Tactical Systems Repairer Program of Instruction Document Review

1. The basic electronic training (BET) for the MOS 33T10, 33R10, 33V10, and 33Y10 consists of the same program of instruction. This basic electronic training covers the following areas and durations:

a.	DC Fundamentals	59.0 hours
b.	AC Fundamentals	58.0 hours
c.	AC Circuits Applications	40.0 hours
d.	Analog Circuits	190.0 hours
e.	Soldering Techniques	20.0 hours
f.	Digital Circuits	122.0 hours
g.	Microprocessors	66.5 hours
h.	Communications fundamentals	42.0 hours
i.	HF Receiver Maintenance	125.0 hours

2. The BET for the MOSs has changed very little in the last twenty years, with the primary differences being the amount of time taken for each of the specific areas of training and the specific electronic trainers that are being used to train the students. Another area that has been expanded is soldering techniques, which now includes high reliability soldering. Some computer assisted learning is also used in the course.

3. At the conclusion of the BET for the MOSs, each individual MOS then has MOS-specific training. For the tactical equipment personnel, 33T MOS, the additional MOS-specific training includes--

a.	Tactical Common Equipment	92.0 hours
b.	Computer System Fundamentals	160.0 hours
c.	SAMS-1	21.5 hours

d.	Amplifier Group OG-181	43.0 hours
e.	TEAMMATE Maintenance	65.5 hours
f.	Master Control Set Maintenance	93.5 hours
g.	MCS Test Interface Device Equipment	50.5 hours
h.	Field Training Exercise with 26.5 hours conducted outside the normal academic day	63.0 hours

The total number of hours for the course is 1285.5 hours, a total of 32 weeks and 1 day. Current planning has the course changing slightly in the near future to a total of 35 weeks and 1 day. The additional training added to the BET to produce a 33T trained repairer has changed significantly over the years as different systems have been fielded and then incorporated into the training program. The computer systems fundamentals training gives an excellent introduction to computer architecture, and, although not an MS-DOS system, training is conducted on equipment that is being incorporated into developmental IEW systems. One complaint of field supervisors is that the 33T technicians do not receive enough systems training, especially on nondevelopmental item (NDI) systems. The field exercise at the conclusion of training introduces the soldier to maintenance in a field environment and provides valuable soldier skills that are not directly MOS-related but that support field troubleshooting.

4. The Basic Non Commissioned Officers Course (BNCOC) includes several of the direct support (DS) and general support (GS) level tasks for the 33T MOS including--

a. Troubleshooting the R-2107/TLQ-17A receiver

b. Troubleshooting the T-1386/TLQ-17A transmitter

c. Troubleshooting the PP-7472/TLQ-17A power supply

d. Troubleshooting the AS-3289 coupler

e. Troubleshooting the antenna positioner, TG-252/MLQ-34

5. The 33T repairer does not receive any DS-/GS-specific training until the BNCOC course; because of this fact many of the 33Ts being assigned to GS detachments as a first tour do not have sufficient training to become productive immediately.

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Appendix B
33T Critical Task List

33T CRITICAL TASK LIST
33TCTL92

Updated as of 12/03/91 Last Review/Update 09/23/91

SKILL LEVEL 1
CHAPTER 2

TASK NUMBER	TASK TITLE	TNG SITE
091-109-0005	Prepare Equipment Inspection and Maintenance Worksheet (DA Form 2404)	33T10
091-109-0006	Prepare Exchange Tag (DA Form 2402)	33T10
091-109-0009	Prepare Maintenance Request (DA Form 2407)	33T10
867-814-1203	Prepare a Maintenance Request (DA Form 5504)	33T10
867-814-1520	Repair EW/I Equipment Using High Reliability Soldering Techniques on Single Layer Boards and Chassis Mounted Components	33T10
867-816-1203	Perform Preventive Maintenance Checks and Services (PMCS) on the AN/TSQ-138 Master Control Set	33T10
867-816-1205	Troubleshoot the AN/TSQ-138 Master Control Set to the Faulty End Item/Black Box	33T10
867-816-1206	Troubleshoot the Interconnecting Box J-4099/TSQ-138 to the Faulty Circuit Card/Module	33T10
867-816-1207	Troubleshoot the Analog to Digital Converter CV-3580/TSQ-138 to the Faulty Circuit Card/Module	33T10
867-816-1208	Troubleshoot the TRAILBLAZER Communications Modem MD-1233/USQ to the Faulty Circuit Card/Module	33T10
867-816-1302	Perform Preventive Maintenance Checks and Services (PMCS) on the AN/TRQ-32(V)2 Radio Receiving Set	33T10
867-816-1304	Troubleshoot the AN/TRQ-32(V)2 Radio Receiving Set to the Faulty End Item/Black Box	33T10

TASK NUMBER	TASK TITLE	TNG SITE
867-816-1310	Troubleshoot the System Controller, C-11845/TRQ-32(V) to the Faulty Circuit Card/Module	33T10
867-816-1601	Perform Preventive Maintenance Checks and Services (PMCS) on the Amplifier Group, OG-184/VRC	33T10
867-816-1602	Troubleshoot the Amplifier Group, OG-184/VRC, to the Faulty End Item/Black Box	33T10
867-816-1603	Troubleshoot the Panoramic Display, IP-1475/VRC to the Faulty Circuit Card/Module	33T10
867-816-1604	Troubleshoot the Amplifier Control, AM-7235/VRC to the Faulty Circuit Card/Module	33T10
867-816-1712	Perform Preventive Maintenance Checks and Services (PMCS) on the Countermeasures Set, AN/TLQ-17A(V)	UNIT
867-816-1713	Troubleshoot the Countermeasures Set, AN/TLQ-17A(V) to the Faulty End Item/Black Box	UNIT
867-816-1902	Perform Preventive Maintenance Checks and Services (PMCS) on the Countermeasures Set, Special Purpose, AN/MLQ-34	33T10
867-816-1903	Troubleshoot the Countermeasures Set, Special Purpose, AN/MLQ-34 to the Faulty End Item/Black Box	33T10
867-816-1904	Troubleshoot the Countermeasures Transmitter, T-1439/MLQ-34 to the Faulty Circuit Card/Module	33T10

SKILL LEVEL 1
CHAPTER 3

TASK NUMBER	TASK TITLE	TNG SITE
113-601-2001	Operate Generator Set 5KW	UNIT
113-601-2003	Operate Generator Set 10KW	UNIT
113-601-2010	Operate 60KW Power Generator Set AN/MJQ-12A	UNIT
113-601-3001	Perform Daily PMCS on Generator Set 5KW	UNIT
113-601-3002	Perform Daily PMCS on Generator Set 10KW	UNIT
113-601-3015	Perform PMCS on 60KW Power Generator Set	UNIT
867-723-1007	Perform PMCS on the MEP-021A 3KW Generator	UNIT
867-723-1008	Operate the MEP-021A 3KW Generator	UNIT
867-777-1122	Perform PMCS on a 30KW Generator Set	UNIT
867-814-1105	Operate a 30KW Generator Set, MEP-114A	UNIT
867-814-1304	Perform PMCS on the Recorder/Reproducer Set, Sound, AN/TNH-20(V)	UNIT
867-814-1305	Troubleshoot the Recorder/Reproducer Set, Sound, AN/TNH-20(V) to the Faulty Component	UNIT
867-814-1306	Align the Recorder/Reproducer Set, Sound, AN/TNH-20(V)	UNIT
867-816-1004	Perform PMCS on the Direction Finder Set, AN/TRD-23	UNIT
867-816-1005	Troubleshoot the Direction Finder Set, AN/TRD-23 to the Faulty End Item/Black Box	UNIT
867-816-1006	Troubleshoot the Radio Receiver, Central, AN/TRR-27 to the Faulty End Item/Black Box	UNIT
867-816-1008	Troubleshoot the Radio Receiver, R-390A/URR to the Faulty Component	UNIT

TASK NUMBER	TASK TITLE	TNG SITE
867-816-1009	Align the Radio Receiver, R-390A/URR	UNIT
867-816-1010	Troubleshoot the Radio Receiver, R-725/URR to the Faulty Component	UNIT
867-816-1011	Align the Radio Receiver, R-725/URR	UNIT
867-816-1012	Align the Azimuth Indicator, IP-669	UNIT
867-816-1400	Perform PMCS on the Intelligence Data Processing Set, AN/UYK-71 (MICROFIX)	UNIT
867-816-1814	Troubleshoot the Radio Receiver, Direction Finder Set, AN/PRD-11 to the Faulty End Item/Black Box	UNIT
867-816-1824	Troubleshoot the Radio Receiver, AN/GRR-8(V)/PRD-11 to the Faulty Circuit Card/Module	UNIT
867-816-1825	Troubleshoot the Panoramic Indicator, IP-1355/PRD-11 to the Faulty Circuit Card/Module	UNIT
867-816-1826	Troubleshoot the Control Processor, C-11495/PRD-11 to the Faulty Circuit Card/Module	UNIT

SKILL LEVEL 2
CHAPTER 2

TASK NUMBER	TASK TITLE	TNG SITE
101-539-1302	Prepare and Maintain a Preventive Maintenance Schedule and Record	UNIT
867-814-2503	Perform Technical Inspection of Turn-in/Incoming EW/I Equipment	UNIT
867-814-2504	Maintain the Maintenance Request Register	UNIT
867-814-6505	Requisition Repair Parts	UNIT
867-816-2209	Troubleshoot the Signal Processor, MX-10509/TSQ-138 to the Faulty Circuit Card/Module	UNIT
867-816-2210	Troubleshoot the Disk Memory Unit, MU-944/TSQ to the Faulty Circuit Card/Module	UNIT
867-816-2601	Troubleshoot the Main Circuit Card Assembly of the Panoramic Display, IP-1475/VRC to the Faulty Component	UNIT
867-816-2702	Troubleshoot the Receiver, R-2107/TLQ-17A(V) to the Faulty Circuit Card/Module	UNIT
867-816-2703	Troubleshoot the Transmitter, T-1386/TLQ-17A(V) to the Faulty Circuit Card/Module	UNIT
867-816-2704	Troubleshoot the Power Supply, PP-7472/TLQ-17A(V) to the Faulty Circuit Card/Module	UNIT
867-816-2705	Troubleshoot the Coupler of the Antenna of the AS-3289/TLQ-17A(V) to the Faulty Circuit Card/Module	UNIT

SKILL LEVEL 2
CHAPTER 3

TASK NUMBER	TASK TITLE	TNG SITE
867-814-2101	Troubleshoot the Radio Receiver, R-2017/U to the Faulty Circuit Card/Module	UNIT
867-816-2004	Troubleshoot the Azimuth Indicator, IP-669 to the Faulty Component	UNIT
867-816-2005	Troubleshoot the Direction Finder-Indicator, ID-2380/G to the Faulty Circuit Card/Module	UNIT
867-816-2402	Troubleshoot the Intelligence Data Processing Set, AN/UYK-71 (MICROFIX)	UNIT

SKILL LEVEL 3
CHAPTER 2

TASK NUMBER	TASK TITLE	TNG SITE
091-499-4001	Establish Priorities for Unit Maintenance of Equipment	UNIT
121-030-9022	Establish and Maintain a Publications Library	33T30
867-814-3203	Assess Battlefield Damage to Electronic Equipment	UNIT
867-814-3204	Quality Control Proper Grounding of Generators and Shelters	33T30
867-814-3513	Quality Control Shop Safety Practices	33T30
867-814-3517	Maintain Accountability of Assigned Tools and Test Equipment	33T30
867-814-3518	Quality Control the Performance of Corrective Maintenance	33T30
867-814-3519	Prepare a Hand Receipt (DA Form 2062)	33T30
867-814-3520	Quality Control the Maintenance Request Register, DA Form 2405	33T30
867-814-3521	Quality Control a Request for a Repair Part, DD Form 1348-6	33T30
867-814-3522	Quality Control a Request for Issue or Turn-in, DA Form 2765-1	33T30
867-814-3523	Prepare a Quality Deficiency Report, SF 368	33T30
867-814-3524	Assign Condition Codes to EW/I Equipment	UNIT
867-814-3525	Quality Control a Request for Publications, DA Form 17	33T30
867-814-3526	Quality Control Technical Inspections of EW/Intercept Systems and Equipment	33T30
867-814-6509	Direct Deployment of an EW Maintenance Facility to the Field	33T30
867-816-3002	Direct the Deployment of Field Maintenance Contact Teams	33T30

TASK NUMBER	TASK TITLE	TNG SITE
867-816-3702	Troubleshoot the Circuit Card/Module of the Receiver, R-2107/TLQ-17A(V) to the Faulty Component	33T30
867-816-3703	Troubleshoot the Circuit Card/Module of the Transmitter, T-1386/TLQ-17A(V) to the Faulty Component	33T30
867-816-3704	Troubleshoot the Circuit Card/Module of the Power Supply, PP-7472/TLQ-17A(V) to the Faulty Component	33T30
867-816-3705	Troubleshoot the Circuit Card/Module of the Coupler Assembly of the Antenna, AS-3289 to the Faulty Component	33T30
867-816-3904	Troubleshoot the Antenna Positioner, TG-252/MLQ-34 to the Faulty Circuit Card/Module	33T30

SKILL LEVEL 3
CHAPTER 3

TASK NUMBER	TASK TITLE	TNG SITE
113-623-7023	Implement Calibration Support	33T30

SKILL LEVEL 4
CHAPTER 2

TASK NUMBER	TASK TITLE	TNG SITE
091-309-0613	Assist in Preparing Standing Operating Procedures (SOP)	33-C42
091-309-0673	Inspect Preventive Maintenance Schedule and Record (DD Form 314)	33-C42
101-539-1127	Maintain the Prescribed Load List (PLL)	33-C42
867-814-4105	Recommend Changes to a Modified Table of Organization and Equipment (MTOE)	33-C42
867-814-4306	Prepare a Supply Assistance Message	33-C42
867-814-4308	Quality Control a Quality Deficiency Report, SF 368	33-C42
867-814-4309	Quality Control a Hand Receipt, DA Form 2062	33-C42
867-814-4310	Direct a Preventive Maintenance Program	33-C42
867-814-4601	Direct Emergency Destruction of Electronic Materiel	33-C42

TRAINING SITE DESIGNATORS

33T10 = 102-33T10 (AIT)
33T30 = 102-33T30 (BNCOC)
33-C42 = 1-33-C42 (ANCOC)

Appendix C
Maintenance Publications and Articles Available for Review

Maintenance related publications available for review of the standard Army maintenance system included:

AR 750-1, Army Materiel Maintenance Policy and Retail Maintenance Operations
DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS)
FM 29-12, Division Maintenance Operations
FM 34-22, Military Intelligence Battalion Combat Electronic Warfare and Intelligence
FM 34-23, Military Intelligence Battalion (Tactical Exploitation)
FM 38-725, Direct Support System (DSS) & Air Line of Communications (ALOC)
FM 43-5, Unit Maintenance Operations
FM 43-11, Direct Support Maintenance Operations (Non-Divisional) Coordinating Draft
FM 43-12, Division Maintenance Operations
FM 43-20, General Support Maintenance Operations
FM 63-2, Combat Service Support Operations - Division
FM 63-3, Combat Service Support Operations - Corps
FM 63-5, Combat Service Support Operations - Theater Army
FM 750-80, Army Wholesale Maintenance Management
Report: Concept of Maintenance for Support of Tactical SIGINT/EW Systems (Post 1980)

ADSM-18-L3N-AWA-ZTH-EUM, Unit Level Logistics System End User Manual
AISM 18-L21-AHN-BUR-EM, Standard Army Maintenance System Level 1 (SAMS-1) End User Manual
AISM 18-L26-AHO-BUR-EM, Standard Army Maintenance System Level 2 (SAMS-2) End User Manual

Articles and briefings available for review on the various subjects included:

Memorandum to the CSM/GS Conference on Restructuring CMF 33, 20 Feb 92, subj: Decision Action for Electronic Maintenance in the Future

Paper, U.S. Army Intelligence School, Fort Devens, subj: EW/Intercept Tactical System Repairer 102-33T10 Course Design

STP 34-33T14-SM-TG, Feb 91, subj: Soldier's Manual and Trainer's Guide MOS 33T Electronic Warfare/Intercept Tactical Systems Repairer

33TCTL92, updated 12/01/91, subj: 33T Critical Task List

Paper, U.S. Total Army Personnel Command (PERSCOM), Mar 92, subj: CMF 33 Future Projections/Concepts

Appendix AD

BDM Paper, undated, Subj: Maintenance MOS Consolidation, Training, and Other Issues - CMF 33

Subject: Maintenance MOS Consolidation, Training, and Other Issues-CMF 33

1. *Introduction*

a. The report on "Maintenance MOS Training and Issues - Series 33T Literature Review and Assessment" raised several issues and questions regarding career management field (CMF) 33. This paper addresses the issues and questions raised, identifies options available, and comments on the feasibility of exercising these options.

b. This report will address--

(1) future requirements for the repair of IEW systems electronics

(2) Army career progression as it affects maintenance personnel

(3) impacts of consolidating CMF 33

(4) training alternatives for the sustainment and expansion of CMF 33 skills

(5) field perceptions and recommendations for the improvement of CMF 33

(6) summary

2. *Future Requirements for the Repair of IEW Systems Electronics*

a. The maintenance requirements in the intelligence field can be broken down into three major areas: the requirements for tactical intelligence equipment repair, the requirements for strategic equipment repair, and requirements for repair of equipment mounted in aviation platforms. Each of these areas includes a common core of maintenance requirements along with some unique requirements in each specific area.

b. Tactical IEW equipment repair personnel will need the following skills on the battlefield of the future:

(1) Common soldier skills to allow the repairer to survive on the battlefield.

(2) A basic electronics background that prepares the repairer for non-system specific diagnosis of electronic failures and system failures. A strong electronics background allows the repairer to apply training received on one specific system to other systems. Training should go to the circuit card

replacement level at a minimum, with component level repair capability desired. Note that component level repair is not currently required. Anticipated changes in maintenance philosophy may require the repairer to perform component level repair in the near future.

(3) High density systems require that IEW repair personnel have system specific training in greater depth than training provided to operators. Although the operator of the future may be using BIT/BITE to diagnose and replace certain CCAs within the system, the repairer will need training beyond this level. The repairer will provide the electronics expertise required when BIT/BITE cannot isolate the fault, or when the fault is incorrectly identified. System specific training on high density systems will build skills and knowledge that will allow the repairer to work effectively on other electronic systems. To ensure repairers trained on high density systems have the foundation to apply their skills to other IEW systems, orientation training should be provided on jamming equipment, direction finding equipment, and receiving equipment.

(4) The IEW repairer in the MI unit is considered the *electronics expert* and must have a training base sufficient to allow transfer of skills from the systems the repairer was trained to fix to the electronics problems encountered on other systems.

(5) The field repairer will need the ability to stay abreast of current technologies through use of extension training materials, interactive video training, and electronic trainers provided to the field. With the current rapid expansion of technology, these training devices and techniques will help maintainers stay abreast of developments in equipment and technologies.

c. IEW strategic equipment repair personnel will need the following skills:

(1) Common soldier skills that allow the soldier to survive and function effectively on the battlefield. Even though strategic personnel are not assigned as field repairers, Desert Shield/Desert Storm operations strongly indicate strategic personnel may be used to supplement tactical units.

(2) A strong basic electronics background that prepares the repairer for component level troubleshooting and repair. The strategic repairer will need extensive computer skills to diagnoseand repair workstations, local area networks, and computer interfaces with IEW systems. An ability to use automated test equipment (ATE) and standard TMDE effectively will also be required.

(3) Specific systems training for strategic repairers poses a challenge because many strategic systems are one of a kind and not available to the TRADOC community for institutional training. To the extent possible, the strategic repairer should be provided training on the same general type of equipment to be encountered in the field.

(4) The strategic repairer has the requirement to stay current with technology, thereby requiring the same types of exportable training packages used by the tactical electronic repairer.

d. IEW aviation equipment repair personnel need skills similar to those required by the tactical repairer with the following differences:

(1) Aviation *flight line* procedures must be incorporated into the training.

(2) The aviation repairer will need to quickly diagnose and repair aviation IEW equipment within the aircraft to the black box level, and must then be capable of bench testing, troubleshooting, and repairing the black box to the circuit card level in a maintenance facility.

(3) As GUARDRAIL Common Sensor and Advanced QUICKFIX are fielded, and the electronics in the systems become more common, institutional and unit training will be adjusted to include these high density sub-systems. Currently the wide diversity of systems in the aviation IEW field makes system-specific training difficult to accomplish in an efficient manner.

(4) The aviation repairer will also have the requirement to sustain and improve proficiency while in the field, again placing a demand for exportable training packages.

e. An additional CMF 33 requirement exists to provide a general support (GS) level repairer for tactical and aviation assets in the field. The GS level repairer requires a background in tactical systems with the capability to diagnose and repair equipment to the component level. Strategic personnel have the required component level expertise but lack a background in tactical systems. Tactical and aviation personnel have the required background but often lack the necessary expertise at the component level. Many GS detachments have a requirement to repair nondevelopmental item (NDI) equipment. Training on much of this equipment is not offered at Army service schools; accordingly, diagnosis and repair experience must be gained through on-the-job training (OJT) or through the study of commercial technical manuals.

3. *Army Career Progression as It Affects Maintenance Personnel*

a. Army career progression patterns show that the most technically competent repairers have the least opportunity to actually work with equipment. A typical career pattern for a repairer is illustrated below:

Timeframe	Rank	Responsibilities
0-2 years	E-1 to E-3	Entry level training and assignment to unit as an IEW repairer
2-4 years	E-3 to E-4	Initial assignment and work as an IEW repairer
4-8 years	E-5 to E-6	Upon promotion to E-5, repairers begin spending part of their time as supervisors, decreasing actual bench time.
8-30 years	E-6 to E-9	Upon promotion to E-6, repairers become primarily managers/leaders, vice repairers

b. In practice, a repairer may spend only one to two tours performing in his primary career field. Skills and experience gained at the junior levels are often not applied as the IEW repairer gets promoted out of repair work and into a leader/manager position. Leaders are needed; however, the loss of expertise inherent in this process needs to be minimized.

c. The IEW maintenance community should elect to look again at options that would allow repairers to spend more than two tours (four to six years) in actual repair work. Options should be crafted to allow hard-to-obtain maintenance skills and capabilities to be used over an entire career. The previously tried specialist ranks addressed this problem but were not deemed successful. Promotion and assignment to technical positions was not always possible and was often based on available slots rather than on technical competence. There was also a stigma attached to being a career repairer rather than a leader. These problems must be resolved before developing a unique career pattern for the IEW repairer.

3. *Impacts of Consolidating CMF 33*

a. The Intelligence Center and School has proposed consolidation of CMF 33 for several reasons: the gravitation toward common or similar equipment in each MOS inventory, the need to simplify recruitment and personnel management, increased assignment diversification, reduced resources resulting in fewer training courses, and the need to standardize duty positions and grade authorizations. The following table indicates the arguments for and against consolidation.

Reason	Pros	Cons
Common/similar equipment in inventory	1. Ground Based Common Sensor and Advanced QUICKFIX will have common equipment. 2. Proliferation of computer workstations brings commonality to the equipment. 3. Increasing contractor support means the equipment soldiers are responsible for will decrease.	1. The uniqueness of strategic equipment, many of which are single systems, precludes generic training. 2. Very little similarity between tactical MILSPEC systems and strategic commercial systems. 3. Eventual decrease in contractors will increase diversity of equipment maintained.
Simplified recruitment and personnel management	1. Eliminates need for multiple qualification standards. 2. Management of one MOS is easier than three MOSs. 3. Decreases number of personnel managers needed.	1. Generic training would require additional maintenance annex courses which would then require tracking personnel by additional skill identifiers (ASI). 2. Course length would increase due to training requirements of one course vice three.

Assignment diversification	1. All repairers will have equal possibility of being assigned to each type of unit. In the near future, nearly all 33Y positions would be OCONUS. 2. Broader background of trained personnel	1. Rotation between tactical MI units, field stations, and aviation units, each with different types of equipment, will severely challenge repairers and may detract from unit readiness. 2. Skills gained in one assignment will diminish in another assignment as repairers work with different equipment. 3. Each unit will have to maintain technical training materials and devices to support newly arrived repairers needing training on the unit's equipment.
Reduction in number of training courses	1. Fewer instructors and support staff needed to teach one course versus three 2. Lower requirements for new MOS trained personnel makes consolidation cost effective. 3. All students would have the same training at both the entry and BNCOC levels.	1. Need to generate new training courses 2. Need to generate additional annex courses for specialized training
Standardization of duty position titles and grade authorizations		

b. Additional rationale for consideration of the question of consolidating CMF 33 MOSs is as follows:

Reason	Pros	Cons
Provide repairer with solid electronics base, able to evolve with new systems and technology with minimum of OJT	1. Generic electronics base allows for transfer of skills to any system.	1. Increased OJT will be required at each unit based on lack of system specific training. 2. New technology will always require additional training.
Schools will be able to refine and update courses over time instead of with each new system or technology.	1. Fewer changes to training courses 2. Fewer resources required to support updating training courses	1. Training courses will quickly become outdated unless new technology is introduced in a timely manner.
New equipment and systems can be trained via exportable training.	1. Fewer resources required if no New Equipment Training Teams required 2. Exportable training can be quickly provided to the field.	1. Exportable training is not as effective as institutional training. 2. New equipment may require New Equipment Training Team. 3. Additional personnel required to generate exportable training.

c. Consolidation of the CMF 33 is feasible, but the quality and quantity of training in the field must increase. Currently units are requesting that the incoming 33 MOS personnel have additional system training, not less.

d. As an interim step, subjects common, or nearly common, among the existing MOSs could be combined yielding some savings without totally combining the 33-series MOSs.

4. *Training Alternatives for the Sustainment and Expansion of CMF 33 Skills*

a. There are several training alternatives available for sustaining the expertise of soldiers in the field. These alternatives include: OJT, training conducted by logistics assistance representatives (LAR), contractor-conducted training, and traditional TRADOC sustainment training.

b. OJT

(1) OJT is training given by soldiers in the unit based on hands-on training using unit equipment. OJT falls into two major areas: a formalized OJT program with scheduled number of hours for various training tasks, and an informal OJT program with training as systems are available and as faults occur in the equipment.

(2) When training personnel on major systems, a formalized OJT program is more effective than an informal one. Tasks, conditions, and standards are identified and integrated into the training package yielding more uniform results. Without school training on a system, a formal OJT program may require in excess of 100 hours of time from both the student and the instructor. As noted during several field visits, units find the requirement to provide OJT a significant detractor from their primary mission. Units also experience personnel, time, and funding constraints in establishing a formal OJT program. Informal OJT has rarely proven effective in terms of generating the requisite levels of technical proficiency within a reasonable timeframe.

(3) Three of the four field units visited recently felt that too much emphasis is placed on the recent 33 MOS graduates' receiving OJT in the unit on major IEW systems. Their views support the historical position of fielded units that soldiers should come to the field trained to perform effectively at the entry level. Resource constraints placed on institutional training, institutional training philosophies, and the need to reduce the numbers of soldiers in the training pipeline generally result in the need for more unit level OJT.

c. LAR Training:

(1) Training by the CECOM LARs has occurred in both CONUS and USAREUR. LAR training is supposed to be formal training, requiring a classroom and access to the equipment for the hands-on portion of the training. LARs have effectively provided instruction on TMDE and the communications equipment components of IEW equipment, and have conducted sustainment classes on IEW systems. LAR sustainment training has been based on either sustainment training packages left in the unit by the new equipment training teams or on training programs of instruction generated within the LARs' office.

(2) LAR training has been effective when presented in a formal manner by trained instructors. A detractor from LARs' training effectiveness is

that not all LAR instructors are familiar with all systems and therefore may not be capable of teaching a sustainment training course on certain items of equipment.

d. Contractor Training

(1) ICS contractors have provided over-the-shoulder OJT at various times. The training has always been off-line and informal, primarily occurring as the contractors performed their mission. Additionally ICS contractors have provided GS training at the detachments on an over-the-shoulder OJT basis. This training assists the GS units as the Army attempts to meet and expand the capability of GS level repairers.

(2) ICS contractors normally have a stable base of personnel experienced on all IEW systems. This pool of knowledge could be accessed to provide formal training for the units and for the Army repairers within the GS detachments. Existing USACIMMC contracts do not contain required tasks to conduct ICS training.

e. TRADOC Sustainment Training:

(1) TRADOC has provided sustainment type training for strategic systems for many years. This program has provided TRADOC school personnel to INSCOM field stations for on-site training/retraining of repairers supporting strategic systems. TRADOC sustainment training has become increasingly important as field stations' level of technical expertise has declined. A similar program could be implemented for current and emerging tactical systems.

(2) TRADOC sustainment training would provide more formal training for the units. The training should be available by request from the units in the field and may require additional school personnel if this need becomes recognized.

5. *Field Perceptions and Recommendations for Improvement in CMF 33*

a. Ft. Stewart Comments (Trip Report-Ft. Stewart, 1992)

(1) Although the MOS 33T repairers assigned to the C-E/IEW Maintenance Sec attend the same advanced individual training (AIT) course as the MOS 33T repairers assigned to GS level units, the low density and high cost of IEW equipment have resulted in centralizing most repair tasks, tools, and test equipment at GS level. This situation results in the perception among repairers assigned to DS level positions that they are merely "box-swappers" who are not allowed to exercise the full range of the skills for which they received training.

(2) Based on the current structure for IEW maintenance, repairers at GS level need more training in basic electronic theory to permit piece-part repair;

such training is not needed for repairers at DS level, unless DS will also be allowed to perform piece-part repairs. There is a disconnect between the training IEW repairers receive and the functions they are allowed to perform at DS level.

(3) IEW system maintenance contracts should include requirements for the contractor to provide training to military repairers.

(4) Concerning training on new IEW systems, LARs require increased training on new systems, and IEW warrant officer maintenance technicians (353A) also need to attend instructor and key personnel (IKP) training sessions on new equipment.

(5) SGT Cox suggested that the overall IEW system should be taught instead of just swapping boxes. Not enough instruction is given in system troubleshooting and repair. Maintainers should be taught what each LRU does within the system, and they should be taught LRU repair.

b. Ft. Hood Comments (Trip Report-Ft. Hood, 1992)

(1) There should be far more contractor training, assistance, and monitoring of soldiers repairing contracted IEW equipment than presently exists. Four of seven units interviewed stated that the system would work far better if contractors were required to formally train, mentor, and assist unit maintenance personnel in fulfilling contractual obligations than under several of the closed door contract systems in which the repair of system equipment is done totally by contractor personnel. This action will lessen the dependence on contractor support in a hostile environment.

(2) Graduates of IEW equipment repairer MOS-producing schools are too generically trained. Too much emphasis is placed on graduates being "On the Job Trained (OJT)." Unit maintenance personnel believe, almost unanimously, that graduates of the C-E and IEW Maintenance MOS-producing schools are too generally trained on too wide a spectrum of materiel, some of which lacks relevance to daily operation. Training utilizes irrelevant mockup equipment and is not specific enough in troubleshooting down to CCA level. MOS 33-series repairers need more training in the basics - test, measurement, and diagnostic equipment (TMDE), antenna theory, wave propagation, and proper soldering techniques. Units believe that mechanics should be school-trained to go into black boxes, troubleshoot, and replace (or even repair) CCAs. In other regards, the schoolhouse appears to rely far too heavily on unit OJT.

c. Fort Devens Comments (Trip Report-Ft. Devens, 1992)

(1) The Army must continue to train and use the 33-series Military Occupational Specialties (MOS) or allow Intelligence School Devens (ISD) to take over all electronics maintenance training for the Army.

(2) Mr. Frank Smith, Directorate of Evaluation and Standardization (DOES) briefed the Graduate Follow-Up Program. The program involves sending out carefully designed surveys to every graduate of ISD. The latest survey was for the 33T MOS for graduates from June 1988 through July 1990. The data are still raw, but a significant finding is that the Built-in Test (BIT) of the current equipment was successful in isolating the equipment fault only 45% of the time. Traditional manual methods were 70% successful. This observation underscores the need for repairers at unit level, since operators depend solely on BIT for fault isolation. Discussion during the briefing with CW4 Jones disclosed that current doctrine is the problem in the type and scope of training for 33T MOS. The Integrated Logistics Support Plans (ILSP) for the current IEW systems greatly influenced the current curriculum.

d. Fort Campbell Comments (Trip Report-Ft. Campbell, 1992)

(1) The 311th agreed with other units surveyed that graduates of IEW equipment repairer MOS-producing schools are too generically trained. The unit's maintenance warrant felt that too much emphasis is placed on graduates being "On-the-Job Trained (OJT)" at the receiving unit. This situation was particularly true of the 33-series repairers who need more training on system-specific skills and on getting into boxes for repair. MOS 33-series repairers need more training in basic test, measurement, and diagnostic equipment (TMDE). Graduates of Communications-Electronics and IEW maintenance MOS-producing schools are too generally trained on too wide a spectrum of materiel, much of which lacks relevance to daily operation. Training is not specific enough in troubleshooting down to circuit card level. The unit believes that repairers should be school-trained to go into the "black boxes," troubleshoot, and replace cards. New maintenance personnel generally cannot read flowcharts and/or schematics. Generator repairers (MOS 52D) are uniformly surprised at the number and types of different generation systems within the unit. Repairers are not trained on many of these systems. Generally, the more experienced mechanics, those who were OJT'd in the unit, were better prepared.

(2) The unit personnel feel they are very proactive in conducting maintenance and logistical familiarization training at all levels of the battalion. The commander feels that this training is critical in maintaining the high operational rate which the 311th enjoys. Officers are required to make a semi-annual maintenance "terrain walk" with the commander and to become familiar with all aspects of maintenance within the battalion. At the soldier and NCO level, this training is accomplished through daily motor pool activities, NCO professional development, and "sergeant's time."

(3) The 311th agreed with other surveyed units that there should be contractor-integrated training, assistance, and the monitoring of soldiers repairing contracted IEW equipment on a far larger scale. The maintenance warrant stated that the system would work more effectively if contractors formally trained and assisted unit maintenance personnel while fulfilling contractual

obligations. This arrangement would lessen the dependence on contractor support in a hostile environment.

e. Fort Bragg Comments (Trip Report-Ft. Bragg, 1992)

(1) There was a distinct difference between the three units interviewed as to their assessment concerning the quality of formal training of the IEW repairers which they receive. The 313th stated (as with most units previously interviewed) that the 33-series soldier they receive is too generically trained and that too much emphasis is placed on graduates being "On-the-Job Trained (OJT)" at the receiving unit. According to the units, MOS 33-series repairers need more training in basic TMDE and components of the AN/PRD-10/11. In addition, units felt that repairers should be school-trained to go into the "black boxes," troubleshoot, and replace cards. Two of the three units felt that the 33-series MOS trained repairman of the system of 7-10 years ago (a troubleshooter) was a superior repairman to the same repairman of today. The 158th believed that the 33-series MOS trained repairman they receive today is adequately prepared and can do most of the jobs assigned to him. Though the unit representative of the 158th agreed that there is not enough training on nondevelopmental items (NDI), he did believe that TRADOC is working to improve the POI of the 33-series MOS and that these problems will be worked out. The representative further believed that, though the 33-series MOS lacks tactical competence, he is taught excellent technical and theoretical skills. This opinion differs from those of all other units visited.

(2) Discussion with Mr. Farmer of ManTech supported other unit visits. He stated that, in his experience, the quality of training of the 33-series MOS has dropped dramatically over the past 5-7 years. He believed that amounts of time expended on system problems are substantially related to the lack of training and repairer errors of the IEW repairers. In addition, he felt that operators did not have enough maintenance training on their systems and in particular PMCS procedures.

6. *Summary*

a. Career Progression. The IEW community needs to ensure that trained and experienced repairers have a career path that will allow them to continue to use acquired skills in IEW equipment maintenance.

b. CMF 33 Consolidation. There are strong reasons for both consolidating and not consolidating CMF 33. The key point may be that, with consolidation, the number of resources required decreases, although support to the field also decreases. Consolidation will put additional burdens on the unit in the field.

c. Training. Reports from the field surface the perception that MOS 33-series personnel are not currently being trained to the level required by field units. Again, as in the past, when the Army is forced to reduce training base resources, training must be adjusted accordingly. The situation could become more complicated with the proposal to consolidate CMF 33 into a single MOS. While this step may be required as TRADOC is forced to do more with less, it will almost certainly result in future repairers reaching the field less able to repair the units' systems than their counterparts of today.

(1) As system specific training decreases, units must increase their OJT, placing additional demands for TRADOC's exportable training packages.

(2) Additionally, consideration should be given to using contractors to provide training to both unit repairers and GS maintenance repairers.

(3) Finally, the Army may find it necessary to increase the amount and level of training offered by logistics assistance representatives.

d. Field Perceptions. Field units want personnel with more specific system training and less requirement for unit OJT. They want to take advantage of the availability of both contractors and LARs to provide additional training for their units. The units want the CMF 33 personnel in the unit to be system trained and able to analyze and fix the system beyond the black box stage, repairing the systems to the circuit card and piece part levels.

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Appendix AE

CIMMC Briefing Charts, undated, Subj: ATM Initiative

USACIMMC

MAINTENANCE AND SUPPLY DIRECTORATE

AUTOMATED TEST MEASUREMENT DIVISION

ATM INITIATIVE

DEVELOP RECONFIGURABLE HYBRID TESTER USING THE ARMY STANDARD CONTACT TEST SET (CTS) WITH VXI EXPANSION CHASSIS FOR PRODUCTION ACCEPTANCE TESTING/FIELD SUPPORT OF IEW SYSTEMS. TESTER TO BE USED AS ATE AND/OR COMMON TMDE.

PRESENT SITUATION

- TESTER IS DIFFERENT FOR EACH PRODUCTION CONTRACTOR OF IEW EQUIPMENT. USUALLY CONTRACTOR CAPITAL INVESTMENT EQUIPMENT.
- EQUIPMENT NOT AVAILABLE FOR FOLLOW-ON PRODUCTION OR SPARES BUY.
- NOT TRANSPORTABLE FOR SRA FIELD USE.
- USE OF INTEGRATED FAMILY OF TEST EQUIPMENT (IFTE) COMMERCIAL EQUIVALENT EQUIPMENT (CEE) FOR PRODUCTION TESTING NOT COST EFFECTIVE FOR LOW DENSITY SYSTEMS. NOT AVAILABLE FOR SRA USE.

ATM INITIATIVE
FUTURE

- PROVIDE TO PRODUCTION CONTRACTOR AS GLE.
- CAN BE USED AS ATE OR COMMON TMDE.
- PRODUCTION CONTRACTOR DEVELOPED ATE PROGRAMS/TMDE PROCEDURES IMMEDIATELY EXPLOITED TO FIELD FOR INITIAL SUPPORT BY SRA.
- ELECTRONIC TECHNICAL MANUALS REDUCES PAPER AND COST. NO TAG AUTHENTICATION/CHANGES ACCOMPLISHED LOCALLY ON PC.
- STANDARD TESTER AVAILABLE FOR FOLLOW-ON PRODUCTION OR SPARES BUY.
- NAVY INTEREST HAS RESULTED IN REIMBURSABLE REQUEST. DEVELOPMENT EFFORTS FOR NAVY TO GREATLY REDUCE ARMY DEVELOPMENT COSTS.

VXI COMMON HARDWARE APPROACH

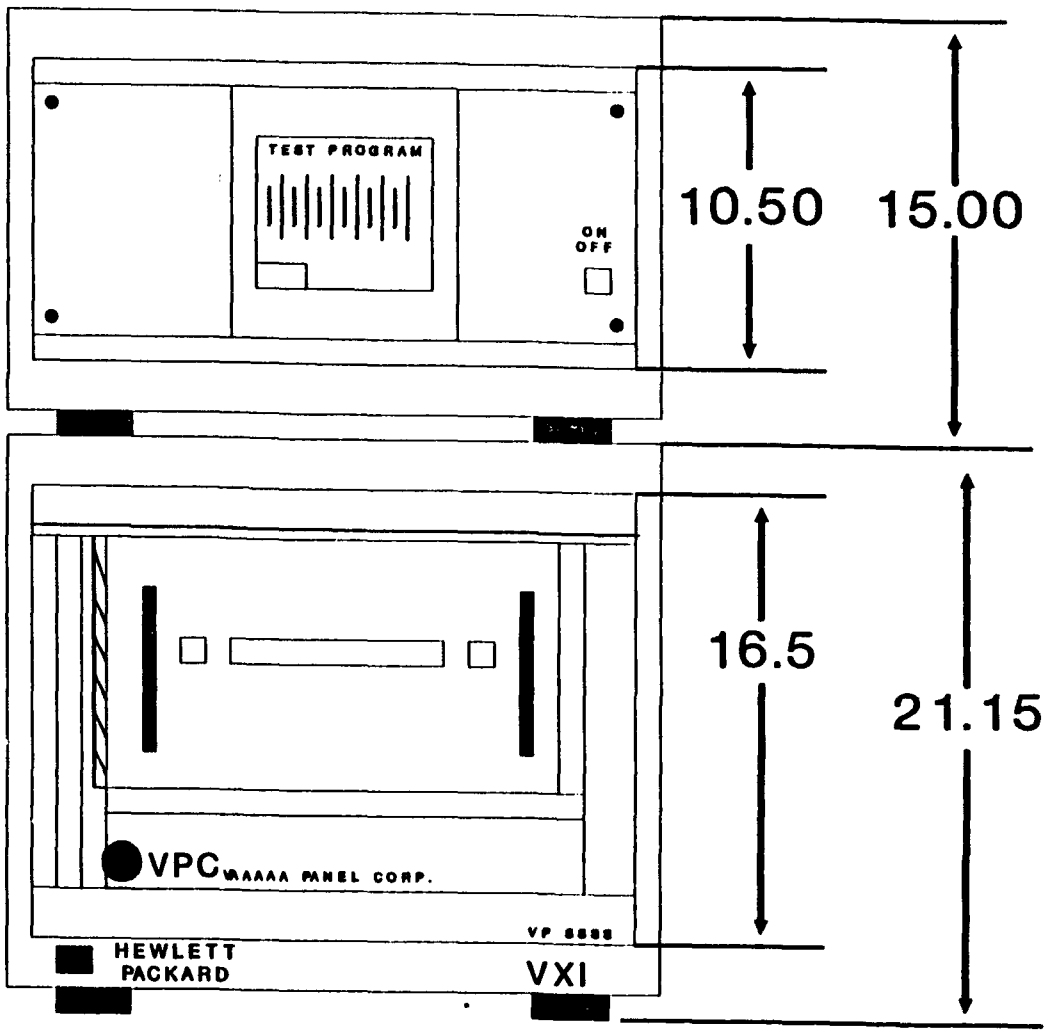
- UTILIZE NON-DEVELOPMENTAL ITEM (NDI)
  - Stable Proven Design
  - Contractor Configuration Management
- ADAPT FOR MILITARY ENVIRONMENT ONLY WHERE NECESSARY
  - Ruggedized Transit Case
  - Meet Specification of Human Factors, Maintainability
- OPERATE AT PRODUCTION FACILITY WITH TRANSPORTABILITY TO FIELD/DEPOT ENVIRONMENT.

VXI HARDWARE

100 lbs

- PORTABLE UNIT IS EASILY TRANSPORTED TO REQUIRED LOCATION.
- OPEN ARCHITECTURE ENABLES EXPANSION TO MEET NEW REQUIREMENTS.
- UTILIZES MULTI SOURCE NDI COMPONENTS.
  - Highly Reliable
  - Cost Effective
  - Short Procurement Time Frame
- GOVERNMENT OWNERSHIP OF SOFTWARE AND HARDWARE DESIGN GREATLY REDUCES TOTAL LIFE CYCLE COSTS FOR:
  - Acquisition of Multiple Systems
  - System Upgrades and Modifications
  - Software Licensing
- FIELD RECONFIGURABLE TO ADAPT TO WIDE RANGE OF REQUIREMENTS.

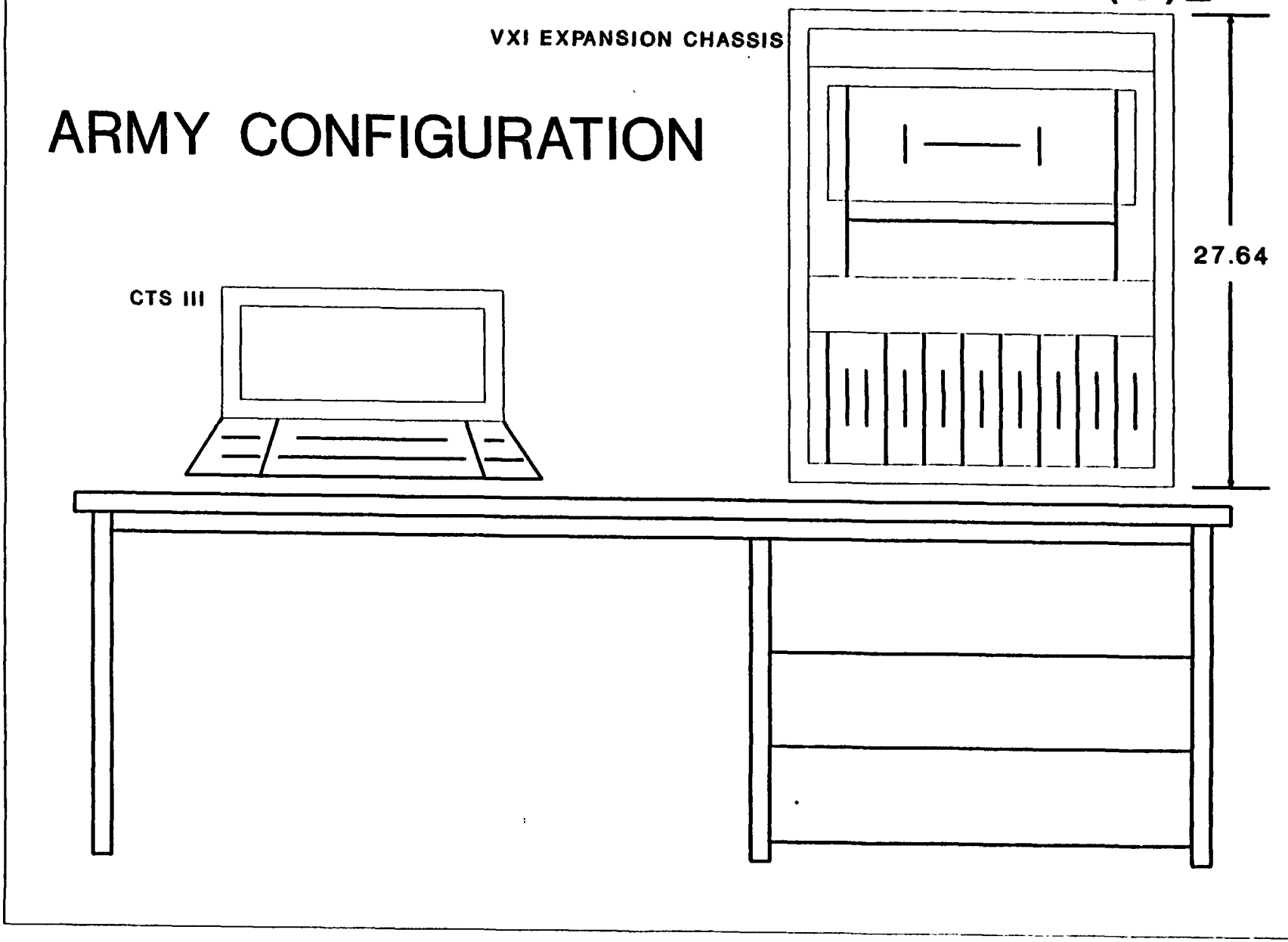
NAVY CONFIGURATION AN/USM-645(V)1



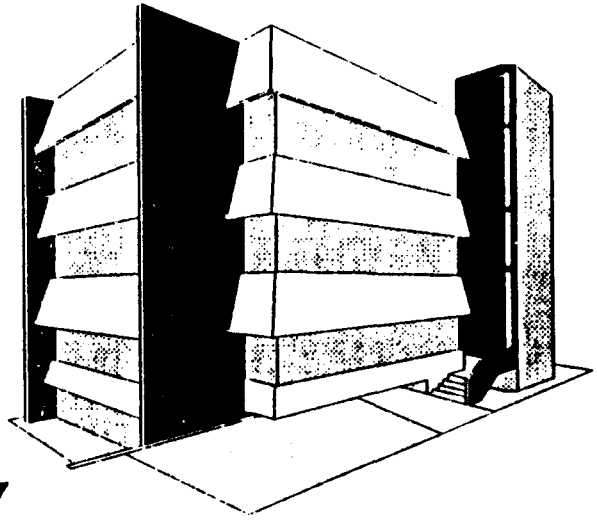
VXI TESTER INSTRUMENT SPECIFICATION

AN/USM-645(V)2

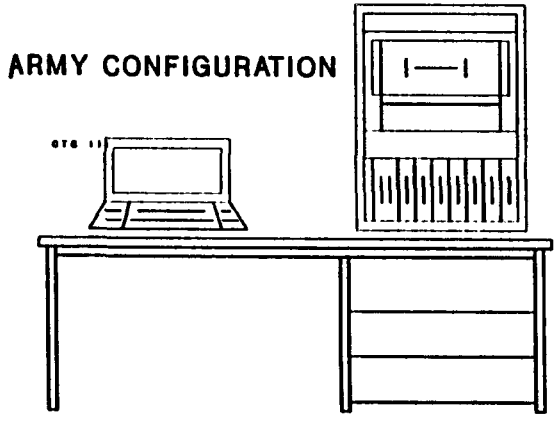
ARMY CONFIGURATION



IEW SYSTEM TEST/REPAIR FUTURE

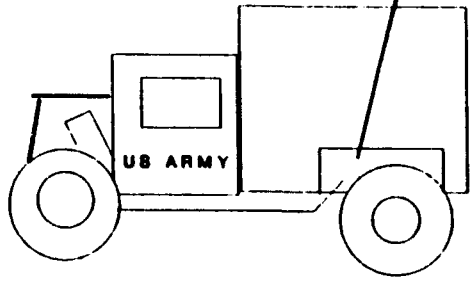


DEPOT



FACTORY PRODUCTION
AN/USM-645(V)2

HMMWV



BATTLEFIELD

STUDY FOR SUPPORT OF PRESENT SYSTEMS

- AN/ALQ-151 QUICKFIX
- AN/MLQ-34 TACJAM
- AN/TRQ-32 TEAMMATE
- AN/TSQ-138 TRAILBLAZER
- AN/TLQ-17A TRAFFICJAM
- AN/TSQ-152 TRACKWOLF

TEST DEVELOPMENT/ EXECUTION ENVIRONMENT

- Test Development Language
- Off-Line Test Program Generation
- Low Cost Commercially Available DOS Based Software
- Automatically Generates BASIC Test Program

FAULT DICTIONARY

- Fault Dictionary Utilizes LASAR 6.4 for Diagnostic
- No Probing Required by Operator
- Highly Reliable With No Chance of Operator Error
- Currently in Use On the AN/USM-465 and AN/USM-410
- Proven in Use by the Navy and Army

ELECTRONIC TECHNICAL MANUALS

- Greatly Reduces Paper
- Provides All Information Required by Operator
- Can be Hosted on Tester or Standalone PC
- Proven on Other Military Programs (ASAS, TEAMPACK, and TRAILBRAZER)
- CALS Compliant Format
- Can be Updated Locally

AN/USM-465 EMULATION

- Allows Preservation of Existing AN/USM-465 Inventory
- Executes Unmodified AN/USM-465 MSP Programs
- Adapts Existing AN/USM-465A Interface Hardware

OVERVIEW

- Maintenance Planning Factors
- Maintenance Concept
- User Maintenance Resources
- Maintenance Control Point
- Typical Maintenance Scenario
- Logistics Requirements

MAINTENANCE PLANNING FACTORS

- Users are Electronic Technicians
- Modular Architecture
- Off-the-Shelf Modules From Various Manufacturers
- Individual Modules are Highly Reliable
- OEM Repair Turnaround Time is 2 to 3 Weeks

MAINTENANCE CONCEPT

- USER MAINTENANCE - Fault Isolates to a Removable Module Using Operational Verification Program, Replace Failed Module With Spare From Maintenance Assist Kit.

- MAINTENANCE CONTROL POINT - Maintain Rotatable Pool of Spare Modules; Perform Failure Verification Testing on Returned Modules; Interface With OEM for Repair/Replacement of Failed Modules.

USER MAINTENANCE RESOURCES

- Operational Verification Program (OVP)
  - Verifies System Function
  - Diagnostics to a Single Failed Module
- Self-Test Interface Connection Device
  - Included in Maintenance Kit for Use With OVP
- Maintenance Assist Kit
  - One Each of Unique Replaceable Modules
  - Spare Cables
  - Express Mailers to Facilitate Return of Failed Modules

MAINTENANCE CONTROL POINT

- Perform Failure Verification on Returned Modules
- Return Modules to Original Equipment Manufacturers for Repair
- Maintain Rotatable Pool of Spare Modules
- Provide Technical Support
- Maintain Database of Failures and Maintenance Actions
- Coordinate Calibration of Testers

LOGISTICS REQUIREMENTS

- Spares - Maintenance Assist Kit Required at Each User Site and at Maintenance Control Point.
- Training - 1 or 2 Day Training Course for Users Covering Operation and Maintenance.
- Float - 1 "Float" Unit Required at NMP to Allow for Battlefield Damage.

TYPICAL MAINTENANCE SCENARIO

- User Executes OVP and identifies Faulty Module.
- User Removes Faulty Module and Replaces With M(dule From Maintenance Assist Kit (MAK).
- User Sends Faulty Module to Maintenance Control Point.
- Maintenance Control Point Verifies Failure and Sends Failed Module to OEM for Repair.
- Maintenance Control Point Issues Spare Module to User to Replenish MAK.
- Maintenance Control Point Records Action in Database.

Appendix AF

PERSCOM Briefing Charts, undated, Subj: CMF 33 Future Projections/Concerns March 1992

U.S. TOTAL ARMY PERSONNEL COMMAND
(PERSCOM)

CMF 33 FUTURE PROJECTIONS/CONCERNS
March 1992

For soldiers of Ft Meade, MD
and VHFS, Warrenton, VA

CMF 33

Professional Development Team

LTC Skinner DSN 221-9290
MSG(P) Nelson

MOS	PDNCO	ASSIGNMENT MGR
All 33 MOS	MSG Sagmoe	SGT Williams

Telephone: DSN 221-0076
Comm (703) 325-0076

PERSCOM CONCERNS
CMF 33

1. IMPACT OF FAST TRACK/VOLUNTARY EARLY TRANSITION PGM/VSI/SSB.
    - A. ARMY READINESS
    - B. ABILITY TO OFFER RETRAINING TO ENHANCE CAREER ADVANCEMENT
    - C. IMPACT ON THE INDIVIDUAL SOLDIER
    - D. ABILITY TO MONITOR RAPIDLY CHANGING MOS STRENGTH POSTURES

2. TOP FOUR IMPACT
    - A. CAREER PROGRESSION
    - B. VSI/SSB IMPLEMENTATION

CMF 33 ISSUES

- MOS 33R
  - RESTRUCTURE PROPOSAL TO MERGE WITH MOS 33V IN PROGRESS. IMPACT ON OUTYEAR AUTHORIZATIONS TBD.

  - PCS TURNAROUND TIME FOR SGT/SL1 APPROX 15 MONTHS FOR NON DESERT STORM PARTICIPANTS (SHORT TOUR AREAS)

  - REQUEST TO OPEN SL1 IN CALLS SUBMITTED FEB 92.

  - SRB (3A) REINSTATED EFF JAN 92.

- MOS 33T
  - SRB TERMINATED EFF 27 SEP 91 EXCEPT ZONE A SPECIALISTS W/SQI 'P'. REQUEST FOR TOTAL ZONE A SRB SUBMITTED FEB 92.

  - REQUEST TO CLOSE ALL OUT CALLS SUBMITTED FEB 92. VSI PROGRAM FOR SSG/SFC.

CMF 33 ISSUES

- MOS 33V
  - RESTRUCTURE PROPOSAL TO MERGE WITH MOS 33R IN PROGRESS. IMPACT ON OUTYEAR AUTHORIZATIONS TBD.

  - SRB RECONSIDERATION PENDING BASED UPON UAV FIELDING SCHEDULED FOR FY 95.

  - REQUEST TO CLOSE OUT CALLS SUBMITTED FEB 92.

- MOS 33Y
  - AWARD OF NEW PMOS BY PSC NEEDS TO BE MONITORED BY LOCAL COMMANDERS.

  - MOST SIGNIFICANTLY IMPACTED FOR AUTH REDUCTIONS FY 91 AUTH 724 - FY 95 PROJ AUTH 374.

CMF 33 ISSUES

- MOS 33Y (CONT)
  - PROMOTION FREEZE TO SSG/SGT IN EFFECT

  - FAST TRACK PROGRAM ENTRY FOR 33Y10 APPROVED IMPLEMENTING MESSAGE FOR PROGRAM OUT JAN 92.

  - ENTRY INTO EXCELLENCE IN RETENTION PROGRAM EFF JAN 92 FOR SGT/SPC. VSI CAT 3 FOR SGT - SFC. SGT REMOVED FROM ERP EFFECTIVE 20 JAN 92.

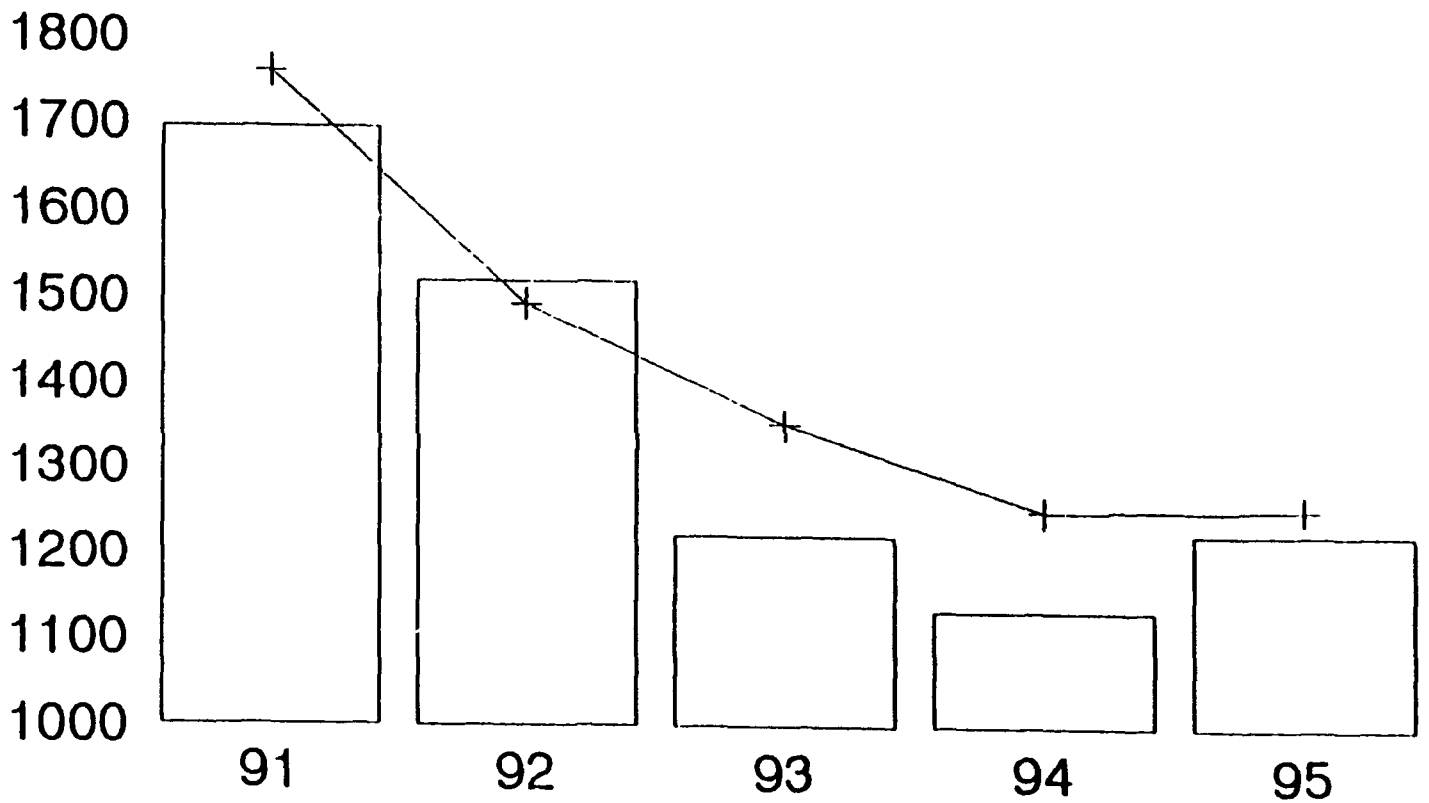
  - OUTCALLS OPENED FOR SSG AND BELOW EFF JUN 91

  - PCS TURN AROUND TIME FOR SGT APPROX 14 MONTHS TOS DUE TO IMPACT OF STOP MOVEMENT (SHORT TOUR AREAS). ITT REQUESTS FOR SPC/SGT WILL BE CONSIDERED.

- MOS 33Z
  - MSG AUTH REDUCED FROM 34 TO 31 EFF FY 92.

CMF 33 OUTYEAR PROJECTIONS

AUTHORIZATION vs OPERATING STRENGTHS



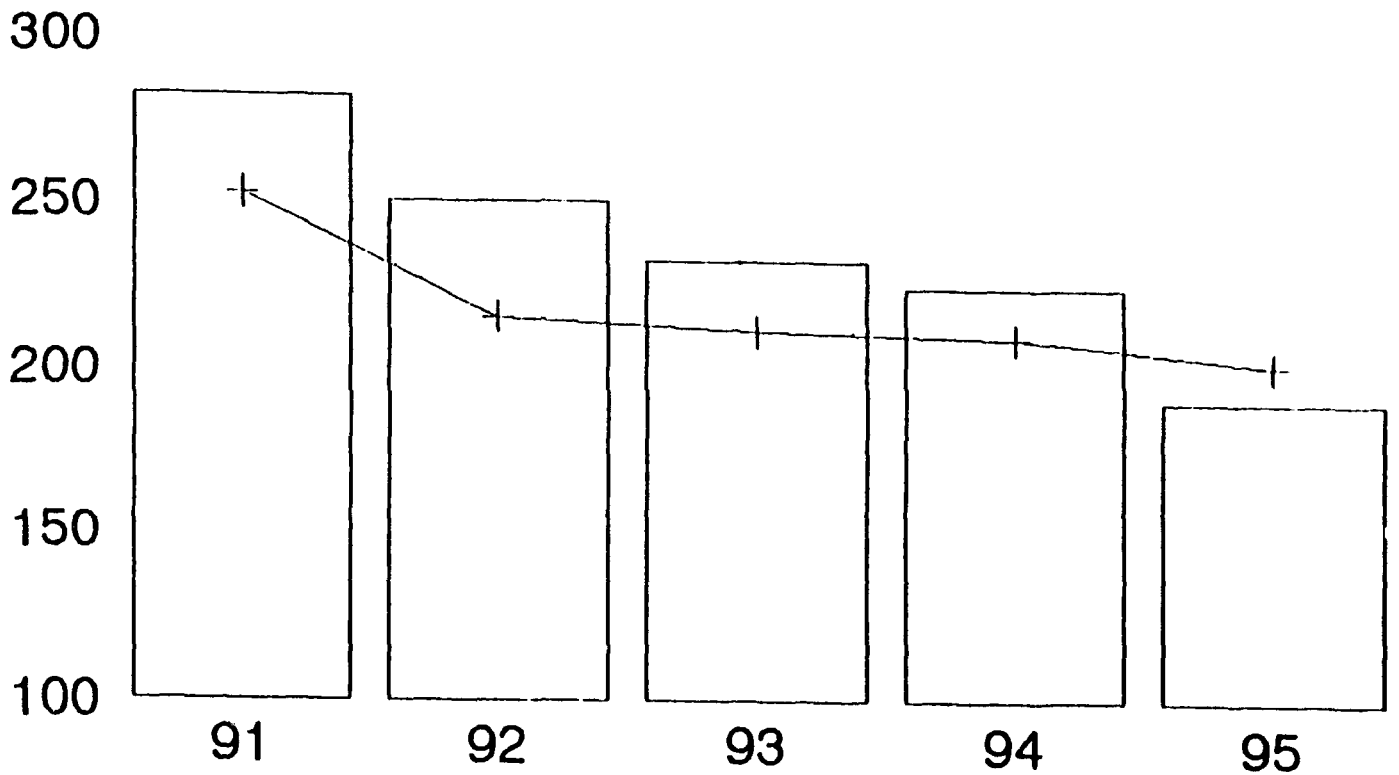
	91	92	93	94	95
AUTHORIZED □	1696	1519	1223	1133	1226
OPERATING +	1761	1493	1354	1253	1257

SCALED IN THOUSANDS

SOURCE: PMAD (MAR 92)

33R OUTYEAR PROJECTIONS

AUTHORIZATION vs OPERATING STRENGTHS



	91	92	93	94	95
AUTHORIZED □	282	251	233	225	191
OPERATING +	253	216	212	210	202

SCALED IN HUNDREDS

SOURCE: PMAD (MAR 92)

MOS 33R
Avn Sys Rpr

SL	AUTH	OPR	%
10	147	120	82
20	32	36	113
30	50	53	106
40	26*	29	112
TOTALS	255	238	93

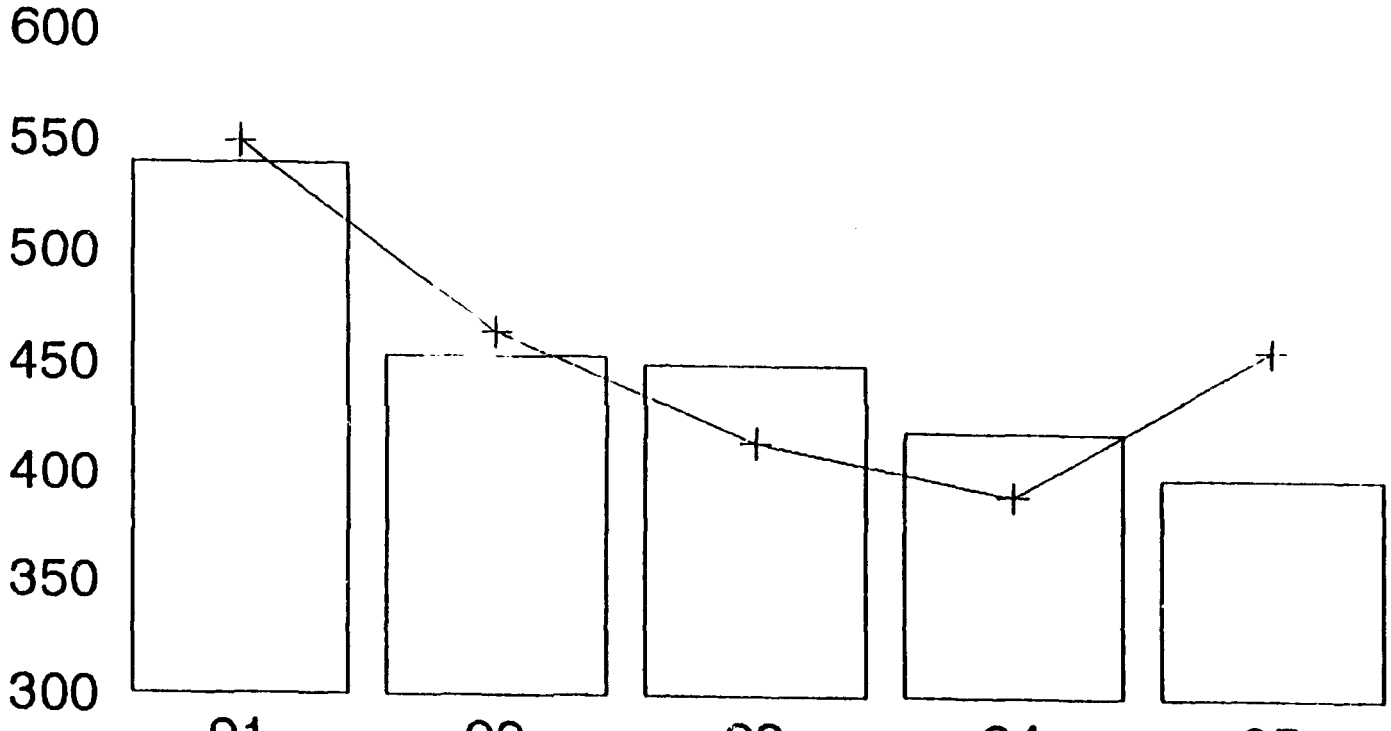
NOTES: FY 92 TRAINING INPUT INCREASED FROM 12 TO 48.
SRB REINSTATED (ZONE A) EFFECTIVE JAN 92
MOS AVAILABLE FOR 33Y10 FAST TRACK ENTRY.

* SFC AUTHORIZATIONS WILL INCREASE BY 4 DUE TO TAADS ERROR CORRECTION

Source: DAPC-45 (ME JAN 92)

33T OUTYEAR PROJECTIONS

AUTHORIZATION vs OPERATING STRENGTHS



	91	92	93	94	95
AUTHORIZED □	540	454	450	420	400
OPERATING +	550	465	415	391	458

SCALED IN HUNDREDS

SOURCE: PMAD (MAR 92)

MOS 33T
Tac Sys Rpr

SL	AUTH	OPR	%
10	263	269	102
20	84	88	105
30	74	91	123
40	76*	77	101
TOTALS	497	525	106

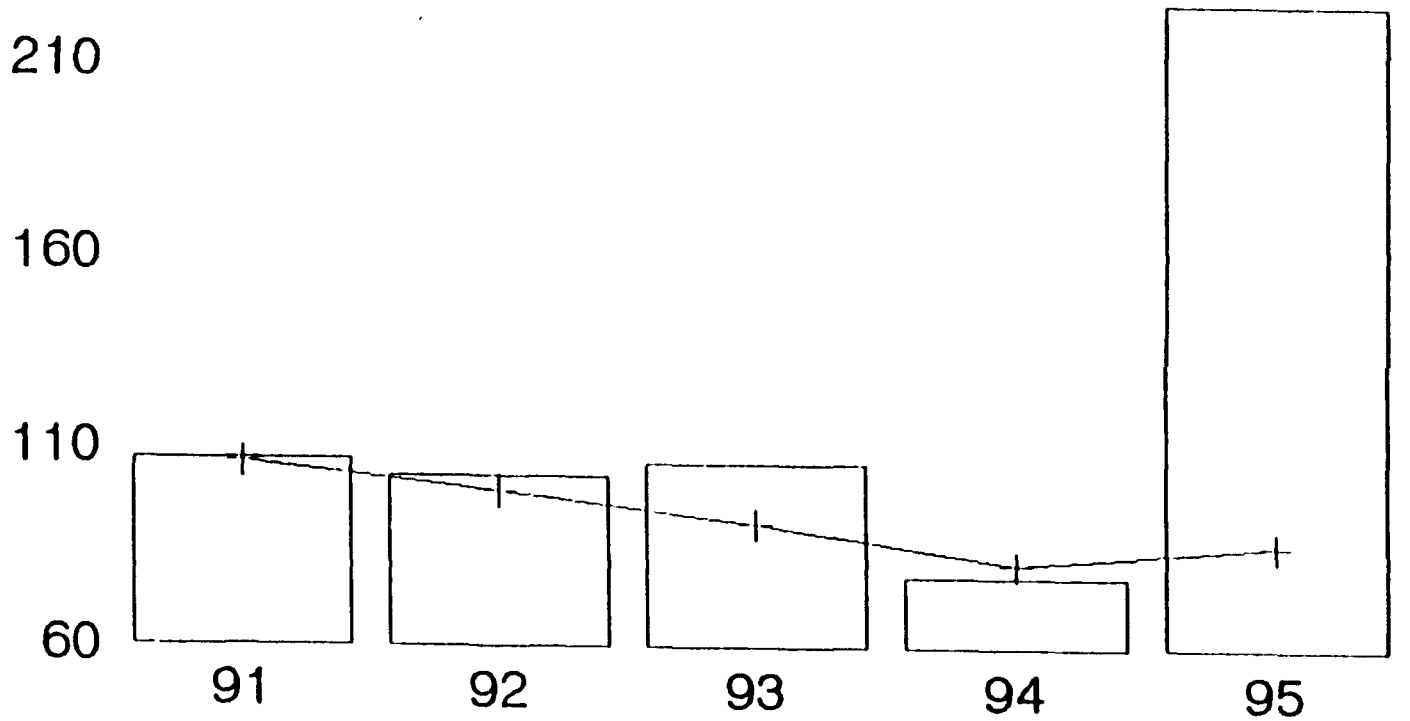
NOTES: FY 92 TRAINING INPUT LOWERED FROM 73 TO 20.

*SFC AUTHORIZATIONS WILL DECREASE BY 4 DUE TO TAADS ERROR CORRECTION.

Source: DAPC-45 (ME JAN 92)

33V OUTYEAR PROJECTIONS

AUTHORIZATION vs OPERATING STRENGTHS



	91	92	93	94	95
AUTHORIZED [ ]	107	103	106	78	226
OPERATING -|-	106	99	91	81	86

SOURCE: PMAD (MAR 92)

MOS 33V
Aerial Sensor Rpr

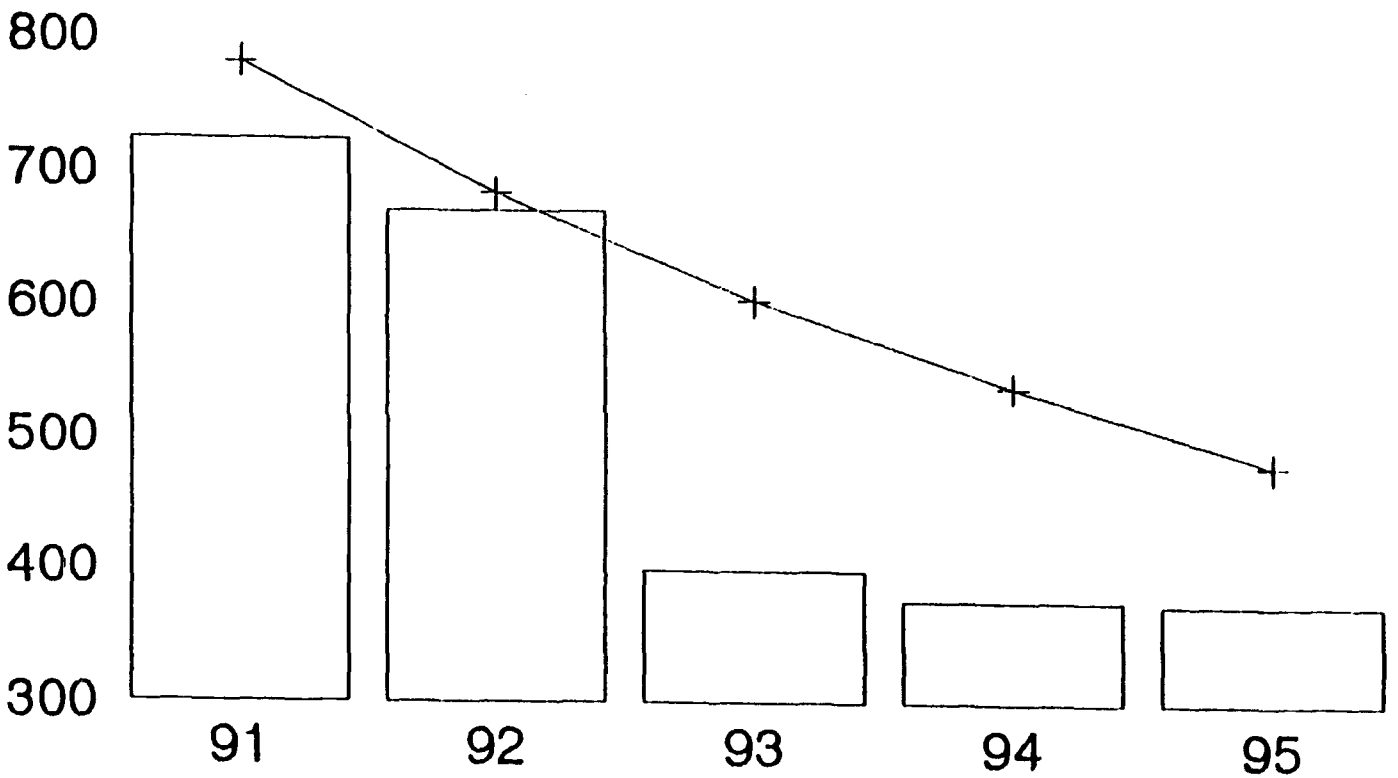
SL	AUTH	OPR	%
10	44	53	120
20	15	21	140
30	33	35	106
TOTALS	92	109	119

NOTES: FY 92 TRAINING INPUT LOWERED FROM 23 TO 8. MOS ANTICIPATED TO GROW TO 226 SOLDIERS BY FY 95 DUE TO UAV FIELDING.

Source: DAPC-45 (ME JAN 92)

33Y OUTYEAR PROJECTIONS

AUTHORIZATION vs OPERATING STRENGTHS



	91	92	93	94	95
AUTHORIZED □	724	671	398	376	374
OPERATING +	781	684	604	540	481

SCALED IN HUNDREDS

SOURCE: PMAD (MAR 92)

MOS 33Y
STRAT SYS RPR

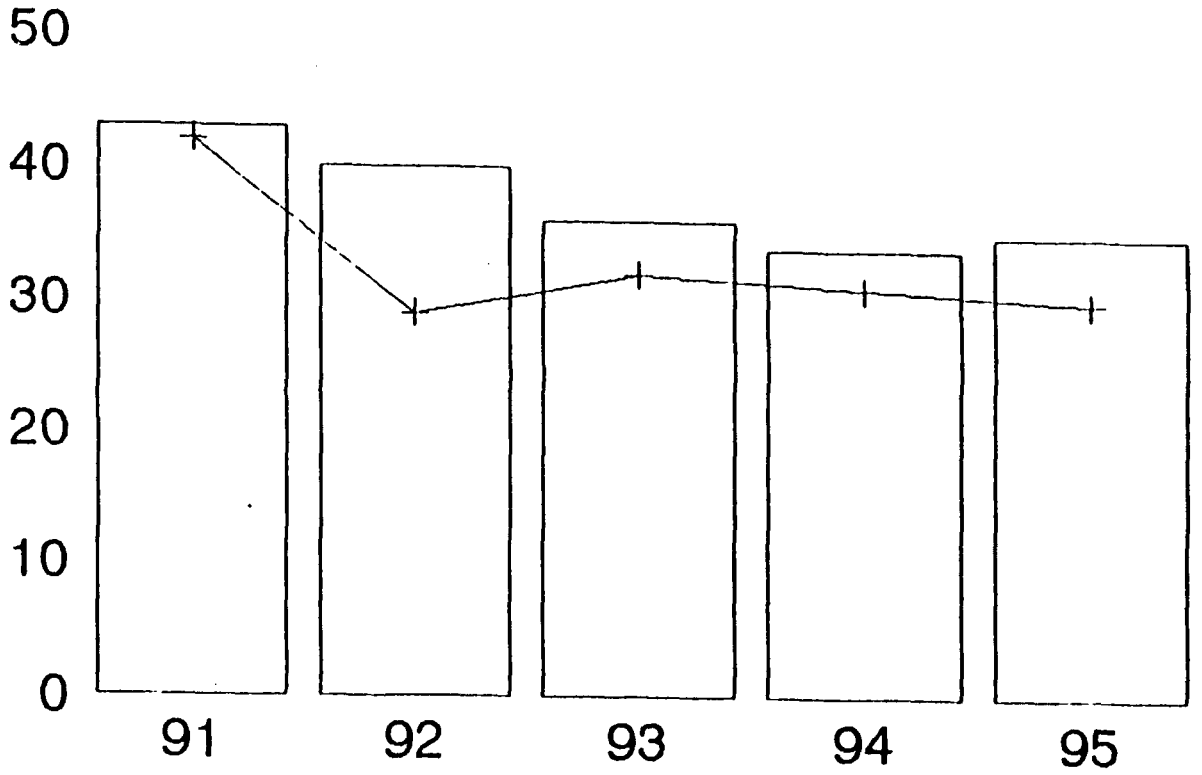
SL	AUTH	OPR	%	(AUTH 9210)
10	241	264	129	(211)
20	213	217	102	(208)
30	144	159	110	(152)
40	107	108	101	(101)
TOTALS	669	748	112	(671)

NOTES: FY 92 TRAINING INPUT LOWERED FROM 130 TO 8.
SPC/SGT PLACED IN PERSCOM EXCELLENCE IN RETENTION PROGRAM EFFECTIVE 01 JAN 92
SGT REMOVED FROM ERP EFFECTIVE 20 JAN 92.

Source: DAPC-45 (ME NOV 91)

33Z OUTYEAR PROJECTIONS

AUTHORIZATION vs OPERATING STRENGTHS



		91	92	93	94	95
AUTHORIZED	□	43	40	36	34	35
OPERATING	+	42	29	32	31	30
MSG AUTHORIZED		34	32	29	27	28

SOURCE: PMAD (MAR 92)

MOS 33Z
Sys Maint Supv

	RANK	AUTH	OPR	%
	SGM	8	5	63
	MSG	31	33	107
TOTALS		39	38	97

Source: DAPC-45 (ME JAN 92)

U.S. TOTAL ARMY PERSONNEL COMMAND

Excellence in Retention Program

- Program effective 01 January 1992
- Objectives:
  - Support Army Drawdown while maintaining quality/readiness.
- Impact:
  - MOS 33Y Spc are only skill level in ERP. Sergeants removed effective 25 Jan 92.
- Procedures:
  - Appl submitted via retain to RMB PERSCOM.
  - Soldier competes with peers only based upon statistical data for grade/MOS.
  - Cdr's recommendation of utmost importance.

Excellence in Retention Program
(Continued)

- PERSCOM Processing:
  - RMB Recommendation
  - Career Branch Recommendation
  - RMB Branch Chief Recommendation
  - RMB Division Chief
  - EPMD Director (GO) (Disapprovals Only)

- Comments:
  - MOS can be removed from ERP based upon Career Branch recommendation.
  - PERSCOM decision is final. Cdr's may submit for reconsideration via Cdr's Override Program. Requests denied following reconsideration are final.

CMF 33 PROMOTION OUTLOOK

Impacting Factors

PROMOTION FORECAST DEPENDENT UPON:

- Impact of VET/VSI/SSB/Retirements
- Future authorization changes

PERSCOM

ENLISTED SELECTION BOARDS

CY 91/92

SELECTION BOARD DATES:

CSM/SGM: SCHEDULED JAN 92

SGM SERB: SCHEDULED JAN 92

SGM ACADEMY : SCHEDULED JAN 92

MSG BOARD : CY 92 SCHEDULED 28 APR 92
(INCLUDES SGT/SFC QMP)

SFC/ANCOC : CY 91 CONCLUDED NOV 91 RELEASE DATE TBD
CY 92 SCHEDULED 06 OCT - 06 NOV 92

CMF 33 PROJECTIONS

Promotion Outlook

Sergeant	FY 91	FY 92	FY 93	FY 94	FY 95
MOS 33R	3.9	3.9	4.6	4.9	4.8
MOS 33T	4.2	0.0	4.4	5.0	5.4
MOS 33V	3.4	0.0	0.0	4.6	5.1
MOS 33Y	3.7	0.0	0.0	4.9	5.4
ARMY AVERAGE	4.8	4.5	4.5	4.5	4.5

Staff Sergeant	FY 91	FY 92	FY 93	FY 94	FY 95
MOS 33R	6.6	5.8	6.3	6.3	6.3
MOS 33T	7.8	6.5	0.0	7.4	7.7
MOS 33V	6.4	7.0	0.0	6.2	7.0
MOS 33Y	5.9	0.0	0.0	0.0	0.0
ARMY AVERAGE	8.6	8.5	8.7	8.7	8.7

Pin On Point Average YOS

CMF 33 PROJECTIONS
Promotion Outlook

Sergeant First Class	FY 91	FY 92	FY 93	FY 94	FY 95
MOS 33R	12.9	12.7	12.2	12.8	12.5
MOS 33T	10.7	12.1	12.5	0.0	14.0
MOS 33Y	14.6	12.4	12.5	13.5	14.2
ARMY AVERAGE	13.3	13.1	13.5	13.8	14.3

Master Sergeant	FY 91	FY 92	FY 93	FY 94	FY 95
MOS 33Z	17.4	17.0	17.4	17.5	18.0
ARMY AVERAGE	17.8	17.7	17.8	17.9	18.1

Sergeant Major	FY 91	FY 92	FY 93	FY 94	FY 95
MOS 33Z	0.0	20.0	20.0	20.5	20.5
ARMY AVERAGE	21.0	21.1	21.0	21.0	21.1

Pin On Point Average YOS

FAST TRACK PROGRAM
33Y10

- ALIGNMENT OF MOS/GRADE OVERAGES THROUGH REENLISTMENT/RECLASSIFICATION.

- PROGRAM ENTRY APPROVED 05 SEP 91. RECLASSIFICATION TARGET FOR FY 92 - 85 SOLDIERS. IMPLEMENTING MESSAGE RELEASED 03 JAN 92.

- AVAILABLE MOS

  -29Y SATELLITE COMM SYS RPR
  -33R AVIATION SYS RPR
  -35G MEDICAL EQUIP RPR - UNIT LEVEL
  -96B INTELLIGENCE ANALYST
  -97B COUNTERINTELLIGENCE AGENT

FAST TRACK PROGRAM
33Y10 (CONT)

- LETTERS WILL BE SENT TO ELIGIBLE SOLDIERS THROUGH SERVICING PSC/UNIT COMMANDERS. IMPLEMENTING MESSAGE CAN BE REFERENCED TO SUBMIT APPLICATIONS.

- SOLDIER OPTIONS
  - -IMMEDIATE REENLISTMENT (AR 601-280, Chp 2)
  - -NORMAL REENLISTMENT (F-3 OPTION ONLY) (ERP IS IN EFFECT FOR THOSE NEEDING TO REENLIST FOR RETRAINING)
  - -VOLUNTARY RECLASSIFICATION
  - -ETS

- MANDATORY RECLASSIFICATION
  - -DA DIRECTED - LAST RESORT
  - -INITIATED IF TARGET GOALS NOT ACHIEVED VIA APPLICATION/ATTRITION

FAST TRACK MOS DATA

- MOS 29Y
  - EL Score requirement 120/Crs Length 37 weeks (poss acceleration)
  - SRB currently 2A only
  - Scty Clnc req now TS/SI
- MOS 33R
  - Opened effective Jan 92
  - ST Score requirement 115/can't be SPC(P)
  - Request to reinstate SRB under review
  - Crs Length 43 weeks (poss acceleration)

FASTTRACK MOS DATA

- MOS 35G
  - CPMOS 35U at SSG promotion outlook remains healthy.
  - EL score requirement 110/Crs Length 38 weeks
  - Currently no SRB
- MOS 96B
  - ST Score requirement 105/Crs Length 13 weeks
  - TS/SI clearance required
  - SRB currently 1A/2A if SQI 'V'

FAST TRACK MOS DATA

- MOS 97B
  - Historical SGT shortage. Promotion outlook to include Warrant Officer Program is healthy
  - ST Score requirement 105. Crs Length 17 weeks
  - FORMAL APPLICATION REQUIRED (DA PAM 600-8 PROCEDURE 3-33)..boarded by MI Branch PERSCOM
  - Possible entry into TSCM program .. interview arranged after acceptance into MOS 97B only.
  - SRB currently 2A....3A/2B with SQI "L/P"
  - 36% of authorizations are language coded.

MOS 29Y
Assignment Outlook

- OCONUS
  - USAREUR
  - INSCOM (VARIOUS)
  - ISC HAWAII
  - 5TH SIG CMD ITALY
  - ISC JAPAN/OKINAWA
  - ISC PANAMA
  - ISC PUERTO RICO
  - 5TH SIG CMD UNITED KINGDOM
- CONUS
  - USA SPACE COMMAND
  - USACCOM/ISC (VARIOUS- MOSTLY FT HUACHUCA)
  - FT BRAGG/FT GORDON

MOS 33R
Assignment Outlook

- Specialist

- - Ft Bliss - Ft Bragg - Ft Campbell
  - Ft Carson - Ft Devens - USAREUR
  - Ft Hood - Ft Huachuca - Ft Ord
  - Ft Polk - Ft Riley - Ft Stewart
  - ALASKA - HAWAII - KOREA
  - HONDURAS/ORLANDO, FL (INSCOM)

- Sergeant

- - Ft Devens - Ft Hood - Ft Huachuca
  - Ft Stewart - KOREA - USAREUR
  - HONDURAS/ORLANDO, FL (INSCOM)

MOS 35G
Assignment Outlook

- OCONUS
  - USAREUR - ITALY - ALASKA
  - KOREA - JAPAN - HAWAII
  - PANAMA
- CONUS (FORSCOM)
  - FT BRAGG - FT CAMPBELL - FT CARSON
  - FT DEVENS - FT DRUM - FT HOOD
  - FT LEWIS - FT MEADE - FT ORD
  - FT POLK - FT RILEY - FT SAM HOUSTON
  - FT STEWART
- CONUS (TRADOC)
  - FT BLISS - FT BENNING - FT KNOX
  - FT LEE - FT LEONARD WOOD - FT SILL
- MISC CMDS (AMC/HSC/HSD/TSG)

MOS 97B
Assignment Outlook

- OCONUS
  - USAREUR - ALASKA - KOREA
  - OKINAWA - HAWAII - PANAMA
  - INSCOM (VARIOUS)
- CONUS (FORSCOM)
  - FT BRAGG - FT CAMPBELL - FT CARSON
  - FT DEVENS - FT DRUM - FT HOOD
  - FT LEWIS - FT ORD - FT POLK
  - FT RILEY - FT STEWART
- CONUS (TRADOC)
  - FT BLISS - FT GORDON - FT HUACHUCA
- MISCELLANEOUS (AMC/SOCOM/READINESS GROUP)

FAST TRACK STATUS
PROCESSED APPLICATIONS

- Number of Applications Rcvd (43)
  - AUGSBURG - 15
  - KUNIA - 1
  - DEVENS - 6
  - BERLIN - 11
  - SINOP - 4
  - AMC - 5
- Selected MOS
  - 29Y - 17
  - 33R - 11
  - 35G - 14

AS OF 13 MAR 92

Appendix AG

BDM International Inc. MFRs Documenting FONECONs

BDM INTERNATIONAL, INC.

MEMORANDUM FOR RECORD 27 April 1992

SUBJECT: FONECON with CW2 McDonald, Special Troops Battalion, 1st COSCOM, 20 April 1992

1. Purpose. To document the results of a telephone conversation on April 20, 1992, between the undersigned and CW2 McDonald, formerly the officer in charge of the 158th SIGINT/EW Maintenance Detachment (GS), Fort Bragg, NC. CW2 McDonald's telephone number is (919) 483-7120 (this is his home telephone number as he is in the process of retiring from active service).

2. Scope. The conversation concerned the situation and operating procedures for the 158th Maint Det in supporting their customers before, during, and after Desert Shield/Desert Storm (DS/S).

3. Comments.

- Initially the 158th GS Maint Det and the 159th GS Maint Det were located side-by-side supporting different customers in the Rainbow SRA (ManTech) compound in Dhahran, Saudi Arabia.

- The 263d Light Equipment Maintenance Co (LEMCO) (GS) arrived from Germany in late Dec 90/early Jan 91. The 263d's MTOE included a cellular SIGINT/EW maintenance team which was attached to the 159th Maint Det from Fort Hood. CW2 McPherson was the OIC of the 263d's IEW operation during DS/S. This unit went initially to King Khalid Military City (KKMC) and then to Log Base E. CWO Williams, OIC of the 159th GS Maint Det, should be able to contact CW2 McPherson if necessary.

- Prior to deployment for DS/S, the 158th had a manual repair parts (Class IX) system. Most transactions were processed through the 58th LEMCO (another manual supply operation) at Ft. Bragg. The 58th LEMCO processed their supply requests through the 659th Intermediate DS Maint (IDSM) Co, which operates an automated supply support activity (SSA). The 659th's SSA transactions were processed to the 2d Support Center, XVIII Airborne Corps' materiel management center. For IEW-unique parts, the 158th usually hand-carried their requests directly to the 2d MMC, bypassing the 58th LEMCO and the 659th SSA. Likewise, when the parts arrived at Ft. Bragg, the 158th picked them up from the installation's central receiving point (CRP), since the 158th's DoD Activity Address Code (DODAAC) was shown on the delivery documents. The 158th turned in the D6S receipt confirmation card to the 2d MMC to close out the supply transaction.

- For non-NSN (part number) requests, the 158th Maint Det had to hand-carry DD Forms 1348-6 to the 659th SSA who sent the request to the installation contractor operated parts store

(COPARS); the COPARS cancelled the requests because COPARS did not support IEW items. Then the 158th hand-carried a new document to the Local Purchase Section of the 2d MMC.

- During DS/S the 158th initially used a Zenith computer to set up their own automated maintenance management system; they finally received a SAMS1 system in October 1990.

- After receiving a SAMS1 system, the 158th began delivering their floppy disks to the 503d Maint Co's SSA, then to the 659th Maint Co's SSA until Jan 15; after this date the 158th moved to Log Base C and was supported by the 758th Maint Co's SSA (USAR). Since the 758th proved to be totally non-responsive, the 158th continued to seek support from the 503d and 659th Maint Cos, especially to pick up parts they had previously ordered through those two SSAs. Those units would not accept any new requests as the 158th was no longer an official customer of theirs. The 158th was positioned about midway between the 503d and the 659th.

- After redeployment the 158th had SAMS1 and no longer worked through the 58th LEMCO. They now dealt through the 659th Maint Co's SSA. They worked out a system to keep visibility of their document RON (request order number) on requisitions so that the ultimate customer would be known to the NICP (B46). The 158th's disk is read by the 659th SSA but passed to the 2d MMC as a remote customer with the 158th's DODAAC.

- CW2 McDonald had several recommendations for improving the IEW repair parts supply system such as--

  - adopt features of the Aviation Intensive Management Item (AIMI) system

  - continue to use stickers to identify IEW parts such as was done during DS/S with the Rainbow SRA stickers

  - permit the GS maint dets to deal directly with the NICP

David P. Nicholas
Project Manager
BDM International, Inc.

BDM INTERNATIONAL, INC.

MEMORANDUM FOR RECORD 27 April 1992

SUBJECT: FONECON with CW2 Lyonnais, 158th Maint Det (GS), 20 April 1992

1. Purpose. To document the results of a telephone conversation between the undersigned and CW2 Lyonnais, officer in charge of the 158th SIGINT/EW Maintenance Det (GS), Fort Bragg, NC, on April 20, 1992. CW2 Lyonnais's telephone number is (919) 396-7403.

2. Scope. The conversation concerned the current operating procedures for the 158th Maint Det in supporting their customers.

3. Comments.

- Unit maintains a shop stock (550 lines) and a bench stock

  Unit submits lists of shop and bench stock to the Logistics Operations Officer of the next higher headquarters, Special Troops Battalion of 1st Corps Support Command

  Unit uses SAMS1 to account for supply stocks and to generate automated supply requests

- SAMS1 outputs a floppy disk containing supply requests; unit hand-carries the disk to the 659th Intermediate DS Maintenance (IDSM) Company, who operates supporting supply support activity (SSA)

- Unit processes requests for non-stock numbered (non-NSN) items manually, preparing DD Forms 1348-6 and processing them through the 659th

- Unit signs hand-receipts for LRUs received from the FORSCOM NDI support activity at Fort Gillem

- Central Receiving Point (CRP) notifies 158th when incoming supplies contain their DODAAC; 158th usually picks up directly from the CRP and notifies the 659th's SSA that they've received the parts

- Off-post customers (like the 124th MI Bn, Ft. Stewart) send or bring unserviceable, repairables to the 158th with documentation (DA Forms 5504 and 2404); the job information is entered directly into SAMS

David P. Nicholas
Project Manager
BDM International, Inc.

BDM INTERNATIONAL, INC.

MEMORANDUM FOR RECORD 27 April 1992

SUBJECT: FONECON with SSG Hoyle, 158th Maintenance Detachment (GS), 22 April 1992

1. Purpose. To document the results of a telephone conversation between the undersigned and SSG Hoyle, 158th SIGINT/EW Maint Det (GS), Fort Bragg, NC, on April 22, 1992. SSG Hoyle's telephone number is (919) 396-7403.

2. Scope. The conversation concerned the current operating procedures for the 158th Maint Det in supporting their customers.

3. Comments.

- The 158th doesn't use the Automated Test Equipment (ATE) Det at Ft. Bragg to test IEW LRUs. Part of the issue is convenience: the ATE Det is several hundred meters from the 158th, while the SRA is right next door. SSG Hoyle doesn't know whether or not the ATE Det has test program sets (TPSs) to check IEW LRUs.

- The usual scenario during a 2-day visit by representatives of the 124th MI Bn from Ft. Stewart is for the 158th Maint Det to job-order the unserviceable items to the SRA as soon as the items are delivered. Often the repairs can be completed while the unit rep is still at Ft. Bragg. In such cases the 124th rep simply takes the repaired module back to Ft. Stewart.

- If the module cannot be repaired in a short timeframe, several criteria are considered to determine whether or not the 158th Maint Det will issue a serviceable replacement out of their "float" (SSG Hoyle's term; he was not sure whether or not the transaction qualified as a true operational readiness float (ORF) issue. DA Pam 710-2-2, para 23-1, indicates the ORF is a quantity of end items kept at DS level for exchange with unserviceable end items to maintain a unit's operational readiness; using this definition, the items stocked within the 158th Maint Det are not ORF.). The decision on whether or not to issue a "float" is the result of discussion between the OIC, 158th Maint Det, and the customer unit.

- When a "float" item is issued, the 158th Maint Det closes out the unit's DA Form 5504 by assigning Action Code V; no supply action (DA Form 2765-1) is required. This system does

not follow the repairable exchange procedures, but is closer to the old direct exchange system.

David P. Nicholas
Project Manager
BDM International, Inc.

Appendix AH

BDM MFR, 22 May 92, Subj: IEW Logistics Assistance Representative and Maintenance Warrant Officer Meeting

BDM

MEMORANDUM FOR RECORD May 22, 1992

SUBJECT: IEW Logistics Assistance Representative and Maintenance Warrant Officer Meeting

1. Purpose. To report the results of a meeting held on 18 March 1992 at USACIMMC to discuss IEW sustainment support before, during, and after Desert Shield/Desert Storm (DS/S).

2. Personnel attending.

a. Ralph Riddle, CIMMC

b. Dennis Dutton, CIMMC

c. William Faux, CECOM LAR from Europe

d. SFC John Wheeler, CECOM LAR from Europe

e. CWO Bruce Stewart, 201st MI Bn during DS/S, now in Hawaii with the 703d MI Bde

f. CW3 Cathy Summers, 533d MI Bn (3d Armd Div) during DS/S, now with HQ INSCOM

g. CW2 Mark Lehtimaki, 201st MI Bn

h. Robert Klebo, BDM International

i. David Nicholas, BDM International

3. Discussion points

- Special Repair Activity (SRA) in Dhahran was very supportive.

- CIMMC provided a good push package of parts.

- Contractors were useful initially for training military repairers; AR 750-1 expressly limits the forward stationing of contractors during wartime to behind the corps rear boundaries.

- Class 9 supply was the biggest problem; the first requisitions from the theater took 90 days to be filled.

- A manual, Reserve Component-operated supply support activity (SSA) was totally non-supportive on part-numbered requests.

- Force/Activity Designators (F/AD) were not updated, at least not on SSA records; this inaction prevented units from assigning higher issue priority designators (IPD) to their supply requests.

- Rainbow SRA stickers were very useful in expediting IEW parts.

- SRA #3 operated by ManTech in Riyadh was significantly less effective than SRAs 1 and 2.

- The SRA was not helpful for EAC systems.

- Being reluctant to use common user transportation for low density parts, MI units had to use their organic vehicles. Although somewhat wasteful of resources, this procedure ensured that low density parts were not lost within the system.

- Contractor personnel must be properly outfitted in a war zone.

- A good use of contractor personnel would be to train military repairers (MOS 33-series).

- "The Class IX system was broke."

- It would reduce confusion to have a single omnibus contractor responsible for coordinating the contracted sustainment maintenance for all IEW sytems.

- When stocked in standard ASLs, IEW parts often get turned in as excess due to lack of demands.

- During DS/S the logistical support bases were useless for IEW systems because there was no low density items support available.

- GS SIGINT/EW maintenance detachments need to be mobile. [Note: Despite the fact that GS units are doctrinally assigned to echelons above corps and given a relatively immobile mission, these SIGINT/EW detachments are often assigned to corps support commands, are positioned in the corps rear area, and are expected to move often enough to provide responsive reparable exchange support to MI units.]

- The materiel developer needs to buy the technical data package for/with all NDI.

- Particularly for NDI with many part-numbered items, use blanket purchase agreements with local electronic shops as the standard source of repair parts.

- There is a definite lack of training for IEW logisticians.

- IEW maintenance officers (353A) and NCOs (MOS 33-series) need to learn basic support supply procedures; such training should be a regular part of basic and advanced courses.

- The CEWI battalion's C-E/IEW Maintenance Section is authorized the Standard Army Maintenance System (SAMS-1); the motor pool uses the Unit Level Logistics System (ULLS) to manage the PLL of common (non-IEW) repair parts.

- Much useful information for the owning unit is contained in the Materiel Fielding Plan and the Integrated Logistics Support Plan.

- LARs ought to receive NET separately from military repairers. [Note: Per Mr. Scheuble at the LAR conference, the LARs will continue to receive NET with military repairers; however, the NET chief will make a point of recognizing that the LARs are special resources whose presence will enhance the training.]

David P. Nicholas
Project Manager
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Appendix AI

INSCOM Lessons Learned

1. (U) JULLS NUMBER: 52140-51800(00021), submitted by MR. DEMY, IALOG, 229-1746, (703)706-1746.

2. (U) DESERT SHIELD/STORM conducted on 06/17/91

3. (U) KEYWORDS: None.

4. (U) TITLE: RETROGRADE OF UNSERVICEABLE ITEMS

5. (U) OBSERVATION: There was no system for retrograde of unserviceable items for repair out of the theater of operations.

6. (U) DISCUSSION:

a. Army logistics doctrine envisions that failed weapons systems are repaired as close to the user as possible. Usually, the repair is accomplished by replacing a part of the system to restore it to operational condition and evacuating the part which was replaced further to the rear where it is repaired and returned to serviceable stock.

b. For reasons of complexity and cost, it is not always possible to accomplish all possible repairs in the theater of operations nor is it feasible to discard all failed system components. For example, aircraft engines must be evacuated to a Government depot or commercial facility for overhaul.

c. Most intelligence equipment is highly complex and is procured in small quantities. For these reasons, it is frequently not possible to accomplish all repairs in an overseas theater of operations, nor can we affort to procure enough spares to discard items when they fail. The support concepts for this equipment usually requires components to be returned to CONUS for repair and reissue as serviceable spares.

d. The DESERT EXPRESS transportation channel was established to expedite the shipment of critically needed spares to Saudi Arabia. In a number of cases, this program lost its effectiveness because the inventory of servicable spares in CONUS was exhausted and there was no corresponding channel to return the unservicable items to CONUS for repair. Intelligence mission systems availability was degraded due to the excessive time lost evacuating unservicable low density, state-of-the-art commercial components to CONUS based repair facilities.

e. Both MICOM and AVSCOM requested that AMC Headquarters intervene to establish a reverse DESERT EXPRESS. The war ended before this effort came to fruition.

7. (U) LESSON LEARNED: The only procedure available to

1. (U) JULLS NUMBER: 52137-13700(00019), submitted by MRS. STARKEY, IALOG, 229-2078, (703)706-2078.

2. (U) DESERT SHIELD/STORM conducted on 06/17/91

3. (U) KEYWORDS: None.

4. (U) TITLE: PERSONNEL POLICIES FOR CONTRACT EMPLOYEES

addressing issues such as hazard and overtime pay.

7. (U) LESSON LEARNED: Timely deployment of contract personnel required to support unique intelligence equipment was negatively impacted by the lack of guidance and standardized procedures.

8. (U) RECOMMENDED ACTION:

a. DA/DOD should establish and publish guidance and direction to all MACOMs and contracting offices addressing logistics and administrative support of required contract personnel. Contract personnel should be provided the minimum protection afforded Department of Army Civilians assigned in theater. Even though providing weapons to non-military personnel may be a legislative point it seems appropriate to resurface this issue due to the increasing requirements for non-military personnel in forward deployed areas of the theater.

b. DA/DOD must develop guidelines for processing clearances in times of national emergencies. These guidelines should specify an expedited process, within acceptable risk parameters, by which SCI clearances can be processed and finalized.

c. DA/DOD should establish regulatory guidelines which would define the contract requirements to be invoked and the pricing formulas to be used for all contracts in support of national emergencies. Contract requirements should be standardized and provided all contracting offices.

9. (U) COMMENT: None

UNCLASSIFIED

1. (U) JULLS NUMBER: 52134-13100(00018), submitted by CPT WHITE, IALOG, 229-2169, (703)706-2169.

2. (U) DESERT SHIELD/STORM conducted on 06/17/91

3. (U) KEYWORDS: None.

4. (U) TITLE: 138TH AVIATION COMPANY READINESS/SUSTAINABILITY

5. (U) OBSERVATION: Early deploying Reserve Component units require more intensive peacetime management.

6. (U) DISCUSSION: The 138th Avn Co had several deficiencies that caused readiness and sustainability problems once the unit deployed to Southwest Asia. It also encountered several problems that complicated its ability to perform the mission.

a. Contractor support. The primary difficulty stemmed from the unit's lack of a war clause in the support maintenance contract for the CEFIRM LEADER system. Since the contract did not have this war clause, the system deployed without contractor support, and the contract was allowed to expire. The contract was not renegotiated in a timely manner, causing further problems for the deployed unit. Eventually, FORSCOM negotiated a contract for a single engineer to provide the required support for the system; however, the tardiness of the entire process resulted in the contractor arriving in theater on 26 February, well after the required date.

b. Training. The unit's organic personnel did not have the necessary background knowledge on the CEFIRM LEADER system to perform the required maintenance/calibration. This apparent lack of adequate training may be a function of the unit's reserve profile: the majority of personnel only work with the system for one weekend a month, which is not enough to provide the continuity required to become well acquainted with complex, unique systems.

c. Documentation. The unit deployed with most of the required documentation for the CEFIRM LEADER system. However, their lack of in-depth knowledge on the system complicated their ability to use the on hand manuals. In mid-February the unit realized that there were a few manuals which had been inadvertently left in Orlando. These manuals covered the higher level calibration issues and computer repair.

d. Required Equipment Upgrades. Although the receivers in the CEFIRM LEADER system were recently upgraded, the commercially manufactured computer portion of the system has not been upgraded in many years. As a result, items like the RF

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3. (U) KEYWORDS: None.

4. (U) TITLE: 138TH AVIATION COMPANY READINESS/SUSTAINABILITY

processor are difficult to support. Likewise, the unit was not on the force modernization distribution list for Test Measurement and Diagnostic Equipment due to their reserve status. This resulted in the unit lacking necessary perferred TMDE items required to sustain equipment availability.

e. Transportation problems. An entire CONEX full of spare parts was lost enroute to Saudi Arabia. This caused significant difficulty for the unit in terms of sustainability. Since RC unique mission systems are inherently difficult to support due to limited spares, repair parts and outdated non-standard equipment the loss of shipments is much more devastating.

f. Depot Support. Some items which were turned in for depot repair prior to deployment were not returned to the unit. Although two RF processors were turned into the depot in October, they were unable to complete a repair contract until January. This was due to the inherent slow contracting operation. The contractor did not receive the processors for repair until late January.

7. (U) LESSON LEARNED: Readiness and sustainability of early deploying RC units must receive increased peacetime management review and initiatives to raise readiness postures and to ensure deployed sustainability is at a level more reflective of the expected operational capability.

8. (U) RECOMMENDED ACTION: That FORSCOM review activation planning for early deploying RC units and AC parent organizations and consider modifying contractual agreements to ensure that adequate contingency contract support is addressed, that DA/DOD emphasize priority processing of contract negotiations for support of deploying/deployed units at all operating levels, that USARC/CONUSA consider increased mission maintenance training, that RC units identify and annotate documentation required for deployment, and that RC units identify obsolete equipment and required equipment upgrades and address these issues through appropriate command channels.

9. (U) COMMENT: None

1. (U) JULLS NUMBER: 52137-13700(00019), submitted by MRS. STARKEY, IALOG, 229-2078, (703)706-2078.

2. (U) DESERT SHIELD/STORM conducted on 06/17/91

3. (U) KEYWORDS: None.

4. (U) TITLE: PERSONNEL POLICIES FOR CONTRACT EMPLOYEES

5. (U) OBSERVATION: Contract guidelines and procedures required in support of National Security Emergencies were ill defined. The ability to plan, implement and sustain required contractor support personnel in a timely manner was impeded by the lack of published guidelines. This resulted in degradation of SIGINT operations while awaiting arrival of contract support personnel in theater. The following three issues have been identified as detrimental to sustaining DESERT SHIELD/STORM Operations.

a. There was a general lack of established guidelines addressing protective clothing, equipment, minimum training requirements, etc. for deploying contract support personnel.

b. Processing security clearances for contractor support personnel to meet mission requirements was diffucult and cumbersome.

c. Conflicts in contract procedures were experienced resulting in delays in finalizing agreements.

6. (U) DISCUSSION:

a. Once contractual agreements were finalized, identification of policy for contractor use of MAC flights, wearing/obtaining military desert camouflage fatigues, NBC equipment, availability of military transportation in and around the Theater of Operations, as well as, availability of billeting and dining facilities was difficult to obtain in an effective timely manner. There was no single source of information affecting contract personnel.

b. Increased mission requirements strained the ability of current contractors to provide cleared personnel within the constraints of the current DOD processing procedures. The system does not appear to be flexible enough to adapt to national emergencies.

c. Guidance was not readily available on contract standards, e.g. Federal Acquisition Regulation clauses or regulatory guidance which would provide a template to be used by all DOD contracting offices in times of national emergencies

UNCLASSIFIED

1. (U) JULLS NUMBER: 52140-51800(00021), submitted by MR. DEMY, IALOG, 229-1746, (703)706-1746.

2. (U) DESERT SHIELD/STORM conducted on 06/17/91

3. (U) KEYWORDS: None.

4. (U) TITLE: RETROGRADE OF UNSERVICEABLE ITEMS

retrograde INSCOM intelligence mission items for repair was to arrange for them to be hand-carried by personnel enroute back to CONUS.

8. (U) RECOMMENDED ACTION: That DA/DOD develop procedures for ensuring rapid movement of critical repair parts to a theater of operations and to ensure that unserviceable reparable items are retrograded in a like manner.

9. (U) COMMENT: None

UNCLASSIFIED

1. (U) JULLS NUMBER: 13429-73800(00007), submitted by LT Peltier, LT Abt, - , ( ) - .

2. (U) ew0007 conducted on 03/04/91

3. (U) KEYWORDS: None.

4. (U) TITLE: Alternator Sysytem for the HMMWV

5. (U) OBSERVATION:(U) The alternator system of the HMMWV which powered the AN/TLQ-17A(V)3 was not reliable during Operation Desert Storm.

6. (U) DISCUSSION:(U) All three of the SANDCRAB systems were temporarily disabled because of the alternators burning out from continuous use. The problem was further complicated by the lack of spare alternators in the theater to replace them. In order to continue operations, the shelters had to be placed on support (chase) vehicles. By ground day, the BN did not have any more chase vehicles or spare alternators. The SANDCRAB system operated an average of 18 hours a day for 6 consecutive weeks.

7. (U) LESSON LEARNED:(U) Plan for a primary and secondary means of power for the SANDCRAB systems.

8. (U) RECOMMENDED ACTION:(U) The SANDCRAB systems should be reconfigured to run off of an alternate power source, in addition to the HMMWV.

9. (U) COMMENT:(U) none

1. (U) JULLS NUMBER: 13429-73800(00007), submitted by LT Peltier, LT Abt, - , ( ) - .

2. (U) ew0007 conducted on 03/04/91

3. (U) KEYWORDS: None.

4. (U) TITLE: Alternator Sysytem for the HMMWV

5. (U) OBSERVATION:(U) The alternator system of the HMMWV which powered the AN/TLQ-17A(V)3 was not reliable during Operation Desert Storm.

6. (U) DISCUSSION:(U) All three of the SANDCRAB systems were temporarily disabled because of the alternators burning out from continuous use. The problem was further complicated by the lack of spare alternators in the theater to replace them. In order to continue operations, the shelters had to be placed on support (chase) vehicles. By ground day, the BN did not have any more chase vehicles or spare alternators. The SANDCRAB system operated an average of 18 hours a day for 6 consecutive weeks.

7. (U) LESSON LEARNED:(U) Plan for a primary and secondary means of power for the SANDCRAB systems.

8. (U) RECOMMENDED ACTION:(U) The SANDCRAB systems should be reconfigured to run off of an alternate power source, in addition to the HMMWV.

9. (U) COMMENT:(U) none