**ACQUISITION INFORMATION MANAGEMENT SYSTEM
TELECOMMUNICATION SITE SURVEY RESULTS**

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1. BACKGROUND

The Assistant Secretary of the Army for Research, Development, and Acquisition has assigned to the Project Manager, Acquisition Information Management (PM-AIM), program management responsibilities for the Army Acquisition Management system development. These responsibilities include the development of the Acquisition Information Management Network (AIMNET), a secure classified network.

PM-AIM also has oversight of the Army Material Plan Modernization (AMPMOD) secure telecommunications network.

The AIM project plans require assessment of the current capabilities of AIMNET, the AMPMOD Network, the development of plans for transition of these to the Defense Data Network (DDN) Defense Secure Network 1 (DSNET1, where the 1 refers to Secret level), the deployment of an AIM Program Manager Information System (PMIS), a Project Manager/Program Executive Officer AIMNET workstation that will run the Program Manager Support System (PMSS) software, and the development of plans for and analysis of telecommunications and hardware-software system enhancements.

PM-AIM has requested assistance in determining the existing , telecommunications resources available in the Army acquisition community and recommending appropriate changes. This paper reports the status of the site survey task in the statement of work.

2. STATEMENT OF THE PROBLEM

The Army acquisition community currently uses a dedicated, point-to-point secure computer network for AMPMOD. It must transition to the DOD supplied DSNET1. This is one of the first networks of this size to begin the transition. The type and amount of computing resources available at individual sites may or may not meet the new network requirements. This task surveys these existing telecommunications resources available in the Army acquisition community. It documents existing communication equipment, computer hardware, associated software, and recommends appropriate changes.

3. APPROACH

An AMPMOD/DSNET connectivity overview diagram was developed. Appropriate sites were selected and visited. Equipment, cabling, and software were located, inspected, and evaluated for DSNET capability. A site connectivity diagram was developed along with a list of pertinent equipment and software. Recommendations included a list of suggested equipment and software procurements and floor plans for each of the sites visited. An overview diagram of DSNET1 connectivity requirements was developed.

4. RESULTS

The sponsor directed that surveys be conducted at 9 of 12 potential locations (Figure 1).

Figure 1. Survey Locations.

The following acquisition community activity is associated with each site:

<u>LOCATION</u>	<u>INSTALLATION</u>	<u>ACTIVITY - PEO</u>
Aberdeen, MD	Aberdeen Proving Grounds	*
Dover, NJ	Picatinney Arsenal	Armaments
Eatontown, NJ	Fort Monmouth	Communications, Command and Control
Huntsville, AL	Redstone Arsenal	Fire Support Systems, Air Defense Systems
Letterkenny, PA	Letterkenny Army Depot	System Information Management Agency
Radford, VA	Radford Army Ammunitions Plant	Research, Development and Acquisition Information Support Activity
Rock Island, IL	Rock Island Arsenal	*
Sierra Vista, AZ	Fort Huachuca	*
Springfield, VA	Fort Belvoir	Acquisition Information Management-PM
St. Louis, MO	St. Louis Federal Center	Aviation Support Command
Warren, MI	Tank and Automotive Command	Combat Support, Armored Systems Modernization
Warrenton, VA	Vint Hill Farms	Intelligence and Electronic Warfare

*Not surveyed per sponsor direction.

4.1 SYSTEM DIAGRAMS

A system diagram was developed to show the overall connectivity of the AMFMOD network (Figure 2).

A system diagram was developed for each location surveyed (Figures 3-11). The information shown includes the identification and location of terminals, cluster controllers, printers, mainframes, front end processors, gateways, cryptographic equipment (a.k.a. cryptos), modems, and communication connectivity to include the DSNET node. It should also be noted that these diagrams show proposed PEO/PM connectivity for the PM-AIM provided AT&T computers.

Figure 2. AMPMOD DSNET Connectivity.

BLDG 173, ROOM PA50

- C** CRYPTO UNIT
- S/C** SAFE WITH CRYPTO UNIT
- M/T** MOHAWK TERMINAL
- DT3** DESK TOP III COMPUTER
- CONV** COAX TO CENTRONIC CONVERTER
- TPC** TEMPEST PERSONNEL COMPUTER
- PTR** PRINTER
- ST3** SECURE TELEPHONE
- M** MODEM

Figure 3. Picatinny Arsenal AMPMOD Connectivity

Figure 4. Fort Monmouth AMPMOD Connectivity.

Figure 5. Redstone AMPMOD Connectivity.

Figure 6. Letterkenny AMPMOD Connectivity.

Figure 7. RDAISA-R AMPMOD Connectivity.

Figure 8. Ft. Belvoir AMPMOD Connectivity.

Figure 9. St. Louis AMPMOD Connectivity.

Figure 10. Warren AMPMOD Connectivity.

Figure 11. Vint Hill AMPMOD Connectivity.

4.2 EQUIPMENT

The sites consisted of a mix of the following major end items of equipment and software:

- Aydin Network Access Component (AYNAC)
- NCR COMTEN Front end processors
- IBM 4381 Host Computers
- Mohawk Data Terminals and Printers
- Tempest Personnel Computers (TPC)
- CRYPTOS and Modems

The following software was installed on the IBM host computers:

- VTAM
- TSO
- ISPF
- AYNAC Control Program

The following software was installed on the Comtens:

- ACF/NCP PEP GEN to support the AYNAC port.

The following software was installed on the AYNAC units:

- Binary Synchronous Communications protocol support software
- HFP protocol support software
- TCP/IP protocol software

5. RECOMMENDATIONS

5.1 CISCO REPLACEMENT OF AYNAC UNITS

Cisco units should replace all fielded AYNAC units.

The AYNAC, as presently configured for AMPMOD, provides connectivity and access via DSNET1 for asynchronous terminals. It also provides the interface for the IBM family of synchronous terminals via cluster controllers and IBM hosts via front end communications processors. It enables a variety of standard terminal devices and computer systems to connect to and communicate through the DDN. It also serves as a data buffer and multiplexer. Up to 16 subscriber (user) devices can be connected to the AYNAC, each through a full duplex, serial input/output (I/O) port. These connections provide the standard data interface such as RS-232, RS-449, and MIL-STD-188. One additional port is provided to communicate synchronously with the DDN node at standard data rates from 2400 to 56000 bits per second (bps). This interface uses the standard X.25 protocol and also provides the TCP/IP support software for the applications programs located on the hosts.

Described in terms of ordered data flow, the ACP exchanges data with the AYNAC using HFP. The AYNAC is connected to a port on either the COMTEN or IBM host in Binary Synchronous Communications (BSC) mode. The COMTEN is in turn channel attached to the IBM MVS host and communicates with the ACP using IBM VTAM. The data flows from the IBM host, through the AYNAC, CRYPTOS, and modems to its destination via the DSNET. The data will arrive from the packet-switched network (DSNET) into a modem, CRYPTO, AYNAC, and then sent to the remote host.

The AYNAC units located at host sites (I.E. Fort Monmouth, Redstone, Warren, St Louis, and Rock Island) use three (3) ports on the subscriber side. Ports 3 and 11 connect to the host. Port 10 connects to a cluster controller. All these units attach to a front end communications processor. Units located at non-host sites provide DDN access for the IBM type terminals via a cluster controller. These sites use from one (1) to five (5) ports on the AYNAC unit.

The AYNAC unit, during the beginning of this task, did not provide X.25 standard service on the subscriber side. PM-AIM initiated a contract to upgrade these units for this service. This enhancement would support PEO/PM connectivity requirements. The AYNAC upgrade was to provide all existing AYNAC functionality for eight (8) subscriber ports as well as six (6) serial communication ports providing DDN X.25 interface. All six (6) ports, being fully configurable, would enable five (5) hosts running DDN X.25 to be attached as subscriber hosts with the remaining X.25 port acting as the network interface.

Due to contractor non-performance (not meeting delivery dates), the AYNAC upgrade contract was canceled while ORNL performed this survey task. A decision made to use Army gateway program equipment during the execution of this task. The AYNAC units will be replaced with Cisco routers.

5.2 SUGGESTED FLOORPLANS

Recommended AT&T 3B2 location floor plans were also developed (Figures 12-23) to take advantage of existing computing facility layouts.

Figure 12. Picatinney Arsenal - PEO Armaments.

Figure 13. Fort Monmouth - PEO Communications

Figure 14. Fort Monmouth - PEO Command and Control

FRONT VIEW OF SAFE
WITH AT&T 3B2

BUILDING 4488 ROOM A343

Figure 15. Redstone Arsenal - PEO Fire Support Systems

FRONT VIEW OF SAFE
WITH AT&T 3B2

Figure 16. Redstone Arsenal - PEO Air Defense Systems

Figure 17. Letterkenny Army Depot - Systems Information Management Agency

Figure 18. Radford Army Ammunitions Plant - Research, Development and Acquisition Information Support Activity.

Figure 19. Fort Belvoir - PM Acquisition Information Management.

Figure 20. St. Louis Federal Center - PEO Aviation Support Command

Figure 21. Tank and Automotive Command - PEO Combat Support

Figure 22. Tank and Automotive Command - PEO Armored Systems Modernization

FRONT VIEW OF SAFE
WITH AT&T 3B2

BUILDING T209 MIDDLE ROOM

Figure 23. Vint Hill Farms - PEO Intelligence and Electronic Warfare.

5.3 OVERALL AIM SITE DSNET1 CONNECTIVITY REQUIREMENTS

Recommended AIM site DSNET connectivity is summarized in diagrammatic form (Figure 24).

Figure 24. Recommended AIM Site DSNET1 Connectivity

5.4 ADDITIONAL TELECOMMUNICATIONS RESOURCE REQUIREMENTS

Additional telecommunications resources -- hardware and software -- are necessary to support these requirements.

5.4.1 Additional Hardware

Additional hardware equipment requirements:

<u>ITEM</u>	<u>QUANTITY</u>
Upgraded Comten Front Ends	5
AT&T 3B2 Hosts Computer	12
Crypto Units, KG-84A	10
Fixed Plant Adaptor (FPA)	8
Secure Telephone Unit STUIII	10
RS232-449 Interface Converters	11
Modems	10
Security Containers	5

Additional equipment broken out by location:

<u>INSTALLATION</u>	<u>CISCO</u>	<u>3B2</u>	<u>KG84</u>	<u>FPA</u>	<u>STU</u>	<u>IC</u>	<u>SC</u>	<u>MODEM</u>
Fort Belvoir		1						
Fort Monmouth	1	2			2	2		
Picatinny Arsenal	1	1			1	1		
Radford	1	1				1		
Redstone Arsenal	1	2	4	3	2	2	2	4
St. Louis Federal Center	1	2	4	3	2	2	2	4
Tank and Automotive Command	1	2			2	2		
Vint Hill Farms	1	1	2	2	1	1	1	2
TOTAL	7	12	10	8	10	11	5	10

NOTE: FPA - Fixed Plant Adapter

IC - Interface Converter

SC - Security Container

5.4.2 Additional Software

For the AT&T 3B2 Computer:

WIN/3B STREAMS TCP/IP
Disk and File Management (DFM)
Network Service Utilities (NSU)
User Environment Utilities (USRENV)
Kermit

For the DTIII:

Communication Program that supports Kermit

5.4.3 Security Containers

The connectivity of the 3B2 computers to DSNET1, and the processing of classified acquisition data, dictates that the 3B2s, and any attached devices, must be maintained at the secret level. Five of the surveyed areas do not have 24 hour, manned, open storage capability or vaults. The following site require security containers:

<u>LOCATION</u>	<u>INSTALLATION</u>	<u>ACTIVITY - PEO</u>
Huntsville, AL	Redstone Arsenal	Fire Support Systems
Huntsville, AL	Redstone Arsenal	Air Defense Systems
St. Louis, MO	St. Louis Federal Center	Aviation Support Command
St. Louis, MO	St. Louis Federal Center	Aviation Support Command - Reconnaissance Aircraft Helicopter

An alternative to securing the entire telecommunications area is to locate the security sensitive equipment inside of a security container of safe (figure 25). the KG84 provides the secure interface to DSNET1 and the STU III (data only with Secure Access Control System (SACS)) to the workstations certified to operate at the secret level.

Figure 25. Proposed Security Container for AT&T 3B2

6. CONCLUSIONS

Each of the nine sites visited will require additional and software for D5NET1 connectivity. Letterkenny Army Depot was the only site not requiring additional hardware. The installations most likely to go on-line for testing after July 1992 are Tank and Automotive Command, Letterkenny Army Depot, and Radford Army Ammunitions Plant.

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