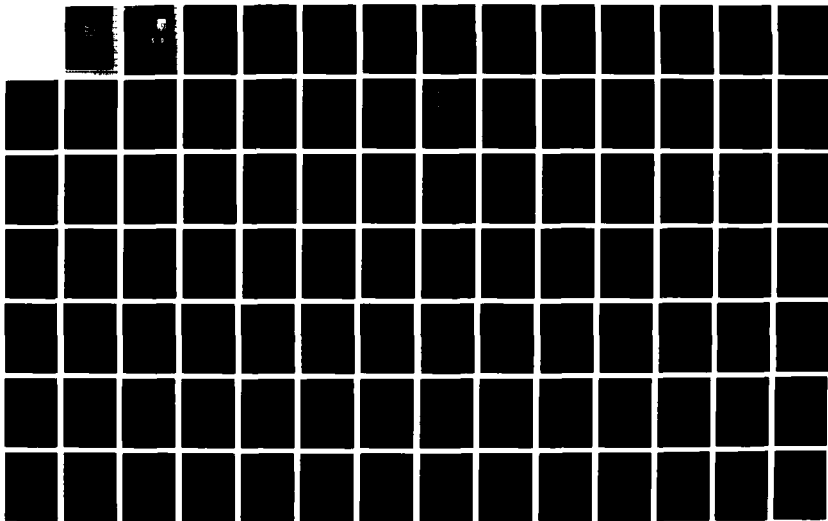
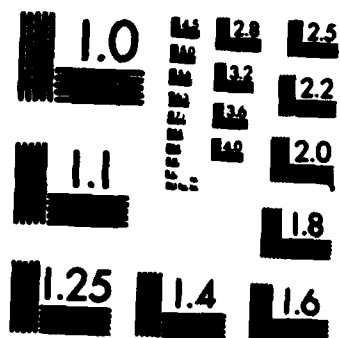


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**AD-A182 056**

**AFVAL-TR-86-4006  
Volume VI  
Part 1**



**INTEGRATED INFORMATION  
SUPPORT SYSTEM (IISS)  
Volume VI - Network Transaction Manager Subsystem  
Part 1 - NTH Development Specification**

**General Electric Company  
Production Resources Consulting  
One River Road  
Schenectady, New York 12345**

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**Final Report for Period 22 September 1980 - 31 July 1985  
November 1985**

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**MATERIALS LABORATORY  
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AIR FORCE SYSTEMS COMMAND  
WRIGHT-PATTERSON AFB, OH 45433-6533**

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Vol VI - Network Transaction Manager Subsystem  
Part 1 - NTH Development Specification

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9 Jan 1986



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## PREFACE

This development specification covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Alan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201 performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users. Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

### TASK 4.2

#### Subcontractors

#### Role

Boeing Military Aircraft  
Company (BMAC)

Reviewer

D. Appleton Company  
(DACOM)

Responsible for IDEF support,  
state-of-the-art literature  
search

General Dynamics/  
Ft. Worth

Responsible for factory view  
function and information  
models

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| <u>Subcontractors</u>            | <u>Role</u>                                                                                                     |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Illinois Institute of Technology | Responsible for factory view function research (IITRI) and information models of small and medium-size business |
| North American Rockwell          | Reviewer                                                                                                        |
| Northrop Corporation             | Responsible for factory view function and information models                                                    |
| Pritsker and Associates          | Responsible for IDEF2 support                                                                                   |
| SofTech                          | Responsible for IDEFO support                                                                                   |

TASKS 4.3 - 4.9 (TEST BED)

| <u>Subcontractors</u>                   | <u>Role</u>                                                                                                                                                                                                                                          |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Boeing Military Aircraft Company (BMAC) | Responsible for consultation on applications of the technology and on IBM computer technology.                                                                                                                                                       |
| Computer Technology Associates (CTA)    | Assisted in the areas of communications systems, system design and integration methodology, and design of the Network Transaction Manager.                                                                                                           |
| Control Data Corporation (CDC)          | Responsible for the Common Data Model (CDM) implementation and part of the CDM design (shared with DACOM).                                                                                                                                           |
| D. Appleton Company (DACOM)             | Responsible for the overall CDM Subsystem design integration and test plan, as well as part of the design of the CDM (shared with CDC). DACOM also developed the Integration Methodology and did the schema mappings for the Application Subsystems. |

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Subcontractors

Role

Digital Equipment  
Corporation (DEC)

Consulting and support of the  
performance testing and on DEC  
software and computer systems  
operation.

McDonnell Douglas  
Automation Company  
(McAuto)

Responsible for the support and  
enhancements to the Network  
Transaction Manager Subsystem  
during 1984/1985 period.

On-Line Software  
International (OSI)

Responsible for programming the  
Communications Subsystem on the  
IBM and for consulting on the  
IBM.

Rath and Strong Systems  
Products (RSSP) (In 1985  
became McCormack & Dodge)

Responsible for assistance in  
the implementation and use of  
the MRP II package (PIOS) that  
they supplied.

SofTech, Inc.

Responsible for the design and  
implementation of the Network  
Transaction Manager (NTM) in  
1981/1984 period.

Software Performance  
Engineering (SPE)

Responsible for directing the  
work on performance evaluation  
and analysis.

Structural Dynamics  
Research Corporation  
(SDRC)

Responsible for the User  
Interface and Virtual Terminal  
Interface Subsystems.

Subcontractors and other prime contractors under other  
projects who have contributed to Test Bed Technology, their  
contributing activities and responsible projects are as follows:

Contractors

ICAM Project

Contributing Activities

Boeing Military  
Aircraft Company  
(BMAC)

1701, 2201,  
2202

Enhancements for IBM  
node use. Technology  
Transfer to Integrated  
Sheet Metal Center  
(ISMC)

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| <u>Contractors</u>                              | <u>ICAM Project</u> | <u>Contributing Activities</u>                                          |
|-------------------------------------------------|---------------------|-------------------------------------------------------------------------|
| Control Data Corporation (CDC)                  | 1502, 1701          | IISS enhancements to Common Data Model Processor (CDMP)                 |
| D. Appleton Company (DACOM)                     | 1502                | IISS enhancements to Integration Methodology                            |
| General Electric                                | 1502                | Operation of the Test Bed and communications equipment.                 |
| Hughes Aircraft Company (HAC)                   | 1701                | Test Bed enhancements                                                   |
| Structural Dynamics Research Corporation (SDRC) | 1502, 1701, 1703    | IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI) |
| Systran                                         | 1502                | Test Bed enhancements. Operation of Test Bed.                           |

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## SECTION 1

### INTRODUCTION

This Network Transaction Manager (NTM) Development Specification (DS) provides the design of the functions to be implemented by the NTM in the Integrated Information Support System (IISS) test bed. This specification supersedes in part the NTM System Design Specification and the NTM Development Specification for Milestone A. This specification views the NTM as a cohesive, testable (stand-alone) system with well defined external interfaces between the NTM and other test bed configuration items. This document further defines the operating environment, internal interfaces, and the database characteristics for the NTM. The major emphasis is the specification of the processing performed by the NTM.

The format and content of this specification is in conformance with the ICAM Documentation Standard (IDS 150120000A) for a Development Specification.

The NTM design presented in this document was derived from: (1) the NTM System Specification, System Design Specification, and Development Specification for Milestone A; (2) technical review meetings with General Electric and, (3) engineering judgement. The previous NTM Specifications provided detailed NTM requirements. Technical review meetings with GE provided overall IISS system requirements, constraints, and functional interface definitions. Engineering judgement was used to derive the NTM design in consideration of these factors.

The NTM external and internal interfaces have been established at a functional level in Section 4.1. Interfaces are identified between NTM and the Common Data Model Request Processor, the User Interface, the Communications Handler, Integrated and Nonintegrated Application Processes, and Host Operating Systems. The internal interfaces section defines the NTM Message Header and the Monitor AP functionality.

The emphasis of this document is found in Section 4.2 where the NTM functions identified in the IDEF\O Model (Appendix B) are described as to their inputs, outputs, and processing requirements.

The NTM data characteristics are detailed in Section 4.5.

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These are based on the data requirements established in the earlier NTM Specifications. The efforts in this area have resulted in an expanded IDEF\1 data model (see Appendix C).

The Appendix to this document provides, in addition to the IDEF models, the data dictionary for the NTM data (Appendix D), the definition of the message types used within the NTM (Appendix E), and a brief explanation of error message handling within the NTM.

## SECTION 2

### SCOPE

#### 2.1 Identification

This specification establishes the performance, development, test, and qualification requirements of a computer program identified as the Network Transaction Manager, hereinafter referred to as the NTM. The NTM is one configuration item of the Integrated Information Support System (IISS).

#### 2.2 Functional Summary

The NTM Computer Program Configuration Item (CPCI) provides control and support services to application processes that are grouped together logically in clusters called Application Process Clusters (APCs\*). The sum of these APCs is the IISS. The IISS is a system that incorporates heterogeneous host machines into a network to provide transaction processing services within a manufacturing environment. This environment is discussed in the IDEF\O model (contained in Appendix B below).

The major functions of the NTM are:

- a. Manage Message: This function provides for the receipt and routing of messages both between application processes residing on a cluster and between clusters. The message manager also provides authorization checks, message and error logging, and message header completion.
- b. Manage Process: This function provides direct support to the application processes on the cluster in terms of initiating the process, communicating with the process, enabling abnormal termination or shutdown, and monitoring the process status.

---

\*The term "Application Process Cluster" (APC) replaces the term "workstation" as used in all previous NTM documentation. In concept, the two terms are synonymous.

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- c. Maintain Operability: This function provides the overall control capabilities of IISS system startup and restart, recovery, and monitoring. This function also collects and records status and statistics. This is a system-wide, host-wide and an APC local function.

### SECTION 3

#### DOCUMENTS

##### 3.1 Applicable Documents

The following documents were used in the definition of the NTH specification.

##### 3.1.1 Specifications

- [1] Control Data Corporation and D. Appleton Co. Inc.; IISS Test Bed CDM Needs Analysis; June 7, 1982; IISS Test Bed CDM State of the Art; June 7, 1982; IISS Test Bed CDM Environment; June 7, 1982; IISS Test Bed CDM System Requirements; June 7, 1982.
- [2] General Electric Co.; Test Bed System Requirement Document (Draft); Revised 23 August 1982.
- [3] ICAM Computer-Based Information System (CBIS) System Requirements Document (Draft); September 10, 1981; CI #SRD3101400000.
- [4] SofTech, Inc.; IISS Test Bed: Network Transaction Manager System Specification; May 1982.
- [5] SofTech, Inc.; IISS Test Bed: Network Transaction Manager System Design Specification; July 1982.
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- [7] SofTech, Inc.; IISS Test Bed: Network Transaction Manager Development Specification (Milestone A); October 1982.
- [8] SofTech, Inc.; IISS Test Bed Programmer's Guide (Draft); January 1983.
- [9] General Electric Co.; Interprocess Process Communication (IPC) Primitives; January 10, 1983.

### 3.1.2 Standards

- [10] American National Standards Committee X3; American National Dictionary for Information Processing; X3/TR-1-77; September 1977.
- [11] ICAM Documentation Standards; 28 December 1981; IDS150120000A.
- [12] SofTech, Inc.; ICAM Test Bed Interim Standards and Procedures; February 1982; ISP620150000.
- [13] General Electric Co.; IISS Software Development Guideline/Conventions (Draft); August 23, 1982.

### 3.1.3 Other

- [14] ICAM Program Office; The Integrated Sheet Metal Center; 30 September 1981.
- [15] ICAM Program Office; The Role of the ICAM Test Bed and Integrated Information Support System (Draft); 18 May 1982.
- [16] SofTech, Inc.; IISS Response to CBIS Requirements and 'Threads': SofTech Reactions; March 18, 1982.
- [17] Digital; VAX-11 Architecture Handbook; Digital Equipment Corp., Maynard, MA, 1979.
- [18] IBM; A Guide to the IBM 3031 Processor Complex and Attached Processor Complex of System/370. GC20-18 54-3, System/370 Principles of Operation, GA22-7000.
- [19] Honeywell; Level 6 Minicomputer Systems Handbook.
- [20] Digital; VAX/VMS\* System Services Reference Manual, AA-DO18B-TE, "VAX-11 Information Directory and Index," AA-DO16D-TE.
- [21] Users Manual: IDBMS (2.0) Users Manual, June 1980.

\*VAX/VMS is a trademark of the Digital Equipment Corporation.

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- [22] Systems Users Manual: IDBMS (2.0) System Users Manual, June 1980. IBM; OS/VS2 MVS Supervisor Services and Macro Instructions, GC28-0683-2.
- [23] Honeywell; Level 6 GCOS MOD400 System Concepts. CZ03-00.
- [24] Honeywell; I-D-S/II Data Base Programmer's Guide, CB56, I-D-S/II Data Base Administrators Guide, CB57.

## SECTION 4

### REQUIREMENTS

This section includes functional and performance requirements for the NTM. In addition, it defines the NTM interfaces to other IISS CPCIs.

#### 4.1 Computer Program Definition

The NTM interfaces with IISS CPCIs, integrated and non-integrated application programs (APs), and host operating systems. The NTM CPCI will interface with several IISS components. The identified ones are: the Communications Handler APs (COMM), the Common Data Model Request Processor (CDMRP), an Operator's Console, and the User Interface (UI).

##### 4.1.1 System Capacities

The NTM system capacity requirements are the following:

- a. A VAX 11/780, that runs the VMS Operating System, a Honeywell Level 6 running the GCOS MOD 400 Operating System, and an IBM 3033 running CICS under MVS. The internal timing rates and computer storage capacities will be determined by the particular host's configurations supplied for the IISS Test Bed [14].
- b. One IISS Operator's Console on the VAX\*.
- c. Sufficient disc storage on all three hosts for an NTM module, its associated files, and a Message and Error Log. Requirements for log archiving have not yet been determined.
- d. Core storage requirements for the NTM have not yet been determined.

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\*VAX is a trademark of the Digital Equipment Corporation.

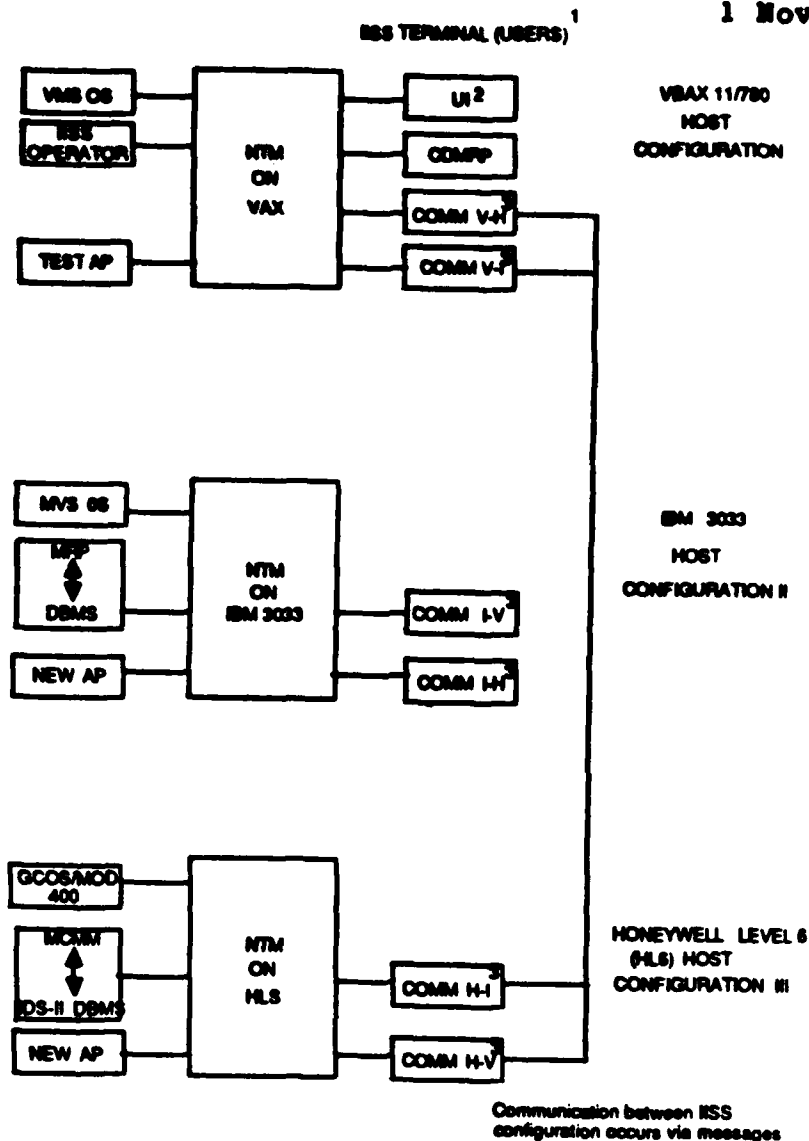


- e. There will be three types of inputs to the NTM. These are:
- inputs from an operator's console
  - messages and service requests from other CPCIs and APs
  - Host Operating System responses and messages.
- f. The volume of the particular types of inputs has not yet been determined.
- g. The initial testbed NTM will:
- operate on the VAX 11/780, the Honeywell Level 6, and an IBM 3033 (Figure 4-1).
  - support COMM, UI, MTR (the IISS Monitor and Operator's Console Cluster, Figure 4-2), CDMRP, and Test Application Clusters on the VAX.
  - support COMM, Monitor, and application clusters on the Honeywell and the IBM (MCMH on the HLB and MRP on the IBM).

#### 4.1.2 Interface Requirements

Requirements placed on the design of the NTM CPI because of its relationship to other equipment/computer programs are as follows. The NTM CPI design is constrained by the requirement to operate in three environments: a VAX 11/780, VMS environment; the Honeywell Level 6, GCOS/MOD 400 environment; and the IBM 3033, CICS (MVS) environment. It must also provide message acceptance and delivery for the other CPCIs including the IISS operator. Figure 4-1 shows the relationships between the hosts and other CPCIs that will exist when the Test Bed supports the three hosts.

The requirement to support the NTM on multiple hosts imposes a need for portability in the NTM CPI design. These portability considerations and existing vendor support for FORTRAN and COBOL effected a decision to use COBOL for the IISS CPCIs. There may be a need to use Assembly Language routines to implement host specific functions that are not available in COBOL. This will only be done where the COBOL compiler does not provide an interface for host specific functions.



**Notes:**

1. The IISS operator interface will be implemented as an IISS terminal or as a separate console interface. It is treated as a separate entity.
2. For the initial test bed, the User Interface (UI) will reside on only one host, the VAX. There will be one UI instance for each IISS terminal that is logged on.
3. The Communication components are named to indicate the link pair (i.e., COMM V-H indicates the component on the VAX that communicates with the Honeywell Level 6).

Figure 4-1. IISS System External Interfaces

The Application Process Cluster (APC) conceptual relationship to the other CPCIs is depicted in Figure 4-2. The NTM rectangles included inside the heavy black rectangle are the NTM's Message Processing Unit (MPU) components for the Application Process Clusters of the VAX host.

Figure 4-3 focuses on the interface between the MPU components of the NTM and the Application Processes (APs). The NTM provides an AP Interface (API) called the NTM I/F Routine to provide APs with the ability to send messages to other APs and to NTM components in the IISS. IISS messages are delivered in mailboxes that are managed by the NTM. The NTM uses IPC Primitives [9] for its interprocess communication functions. These Primitives provide the process to process functions of mailbox creation, mailbox writes, mailbox reads, waits, timers, and mailbox deletion.

The AP Interface provides a set of high level NTM calls for use by the AP, that are, in concept, similar to traditional operating system calls. Figure 4-4 contains a list of these NTM Service Calls. A complete description of the NTM calls is contained in the IISS Programmer's Guide [8]. A set of NTM I/F routines are linked to each IISS AP to provide the integration of the AP into the IISS Test Bed. The NTM interface requirements for the NTM I/F routines for new APs, existing APs, COMM, and the UI are described in the following paragraphs. The Operator Interface to the NTM requires a different NTM interface, and is described in Section 4.1.2.5.

#### 4.1.2.1 NTM Interface for New Applications

The NTM Interface for new IISS Applications is the set of NTM Services described in the IISS Programmer's Guide [8]. The AP uses the NTM service calls to send and receive messages from other IISS APs. The AP interfaces directly to the AP Interface component of the NTM (Figure 4-5). The interfaces will be implemented as a set of NTM I/F subroutines that will be bound (linked) to the AP to form the AP's runtime module.

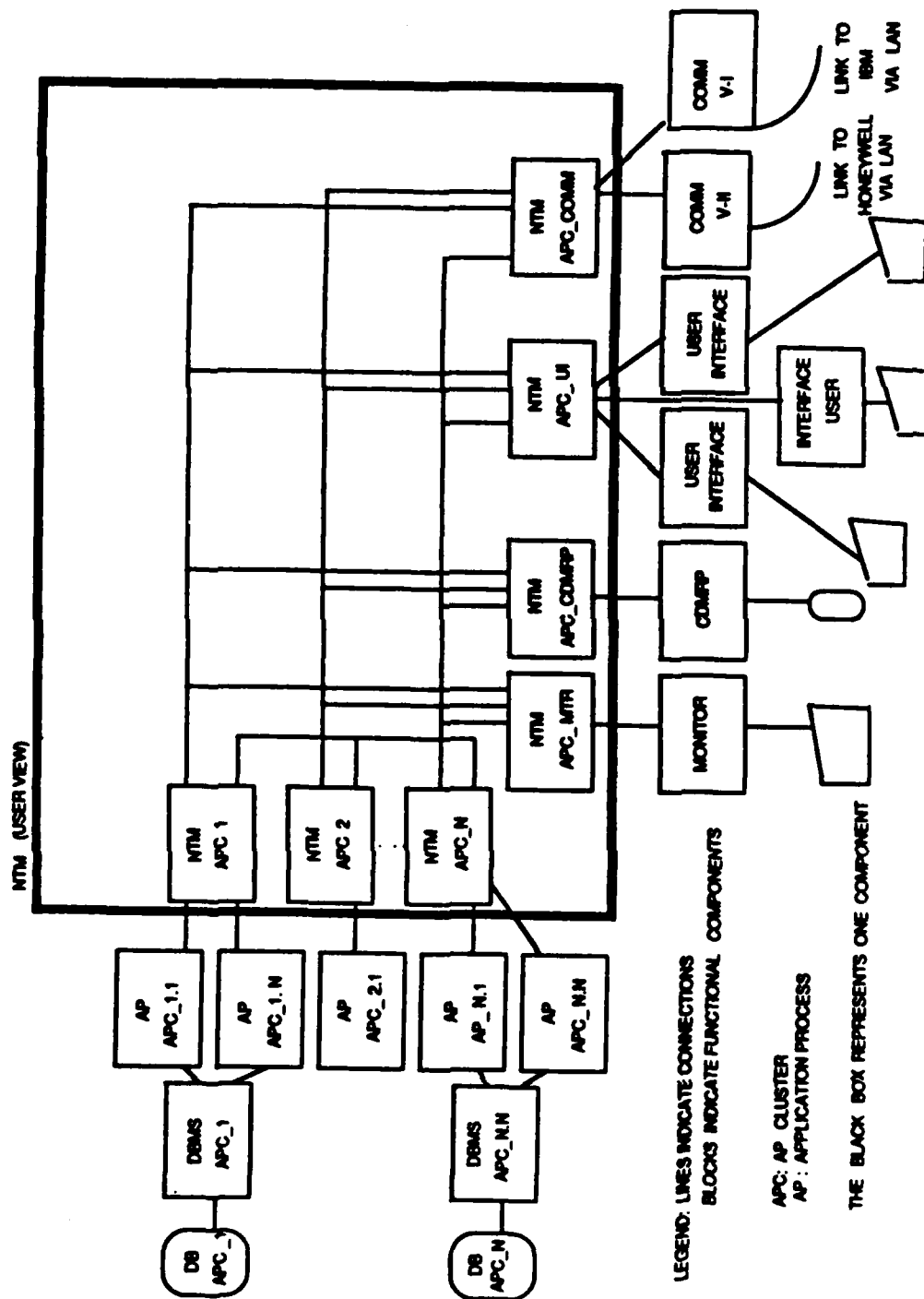


Figure 4-2. IISS Architecture - Conceptual Model on VAX

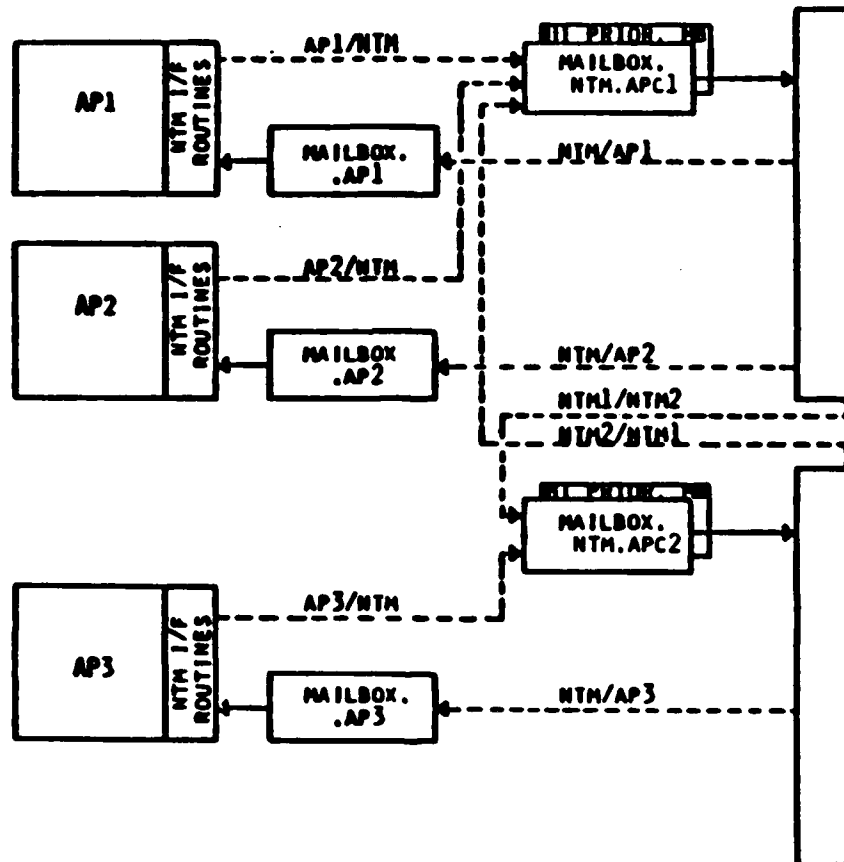


Figure 4-3. NTM/AP Interfaces

**Connection Services**

- \* **INITAL** Provide initiation services for new APs
- \* **TRMNAT** Signal AP termination status
- \* **ENDRCY** Signal end of recovery processing

**Communication Services**

- \* **NSEND** Send a message
- \* **GDSEND** Send a guaranteed delivery message
- \* **ISEND** Send an initiation request
- \* **QSEND** Send a Queue-Server's reply message
- \* **CHKMSG** Check for any current messages (use RCV to retrieve messages)
- \* **SETDLY** Specify delay condition for next message
- \* **SIGERR** Notify the NTM of an AP (non-fatal) error
- \* **GDACK** Acknowledge receipt of a guaranteed delivery message
- \* **MSGACK** Acknowledge receipt of a message
- \* **RCV** Receive a message
- \* **TSTMOD** Switch IISS message test mode on or off

**NTM Requests**

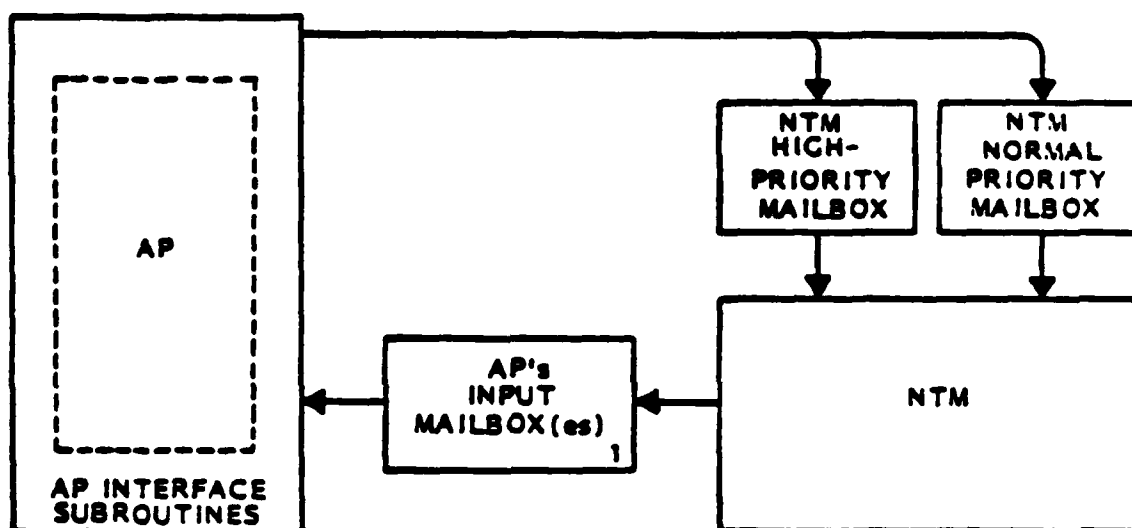
- \* **APSTAT** Get the status of a specified AP
- \* **HSTATS** Get the status of a specified host
- \* **WHTHST** Request the name of the current host
- \* **WHATAC** Request the name of the current AP Cluster
- \* **WKONCA** Request "wake-up" on specified AP Cluster availability
- \* **ACSTAT** Get the status of a specified AP Cluster
- \* **SIGABT** Signal to NTM to abort an AP
- \* **PRSTAT** Get the status of one or more paired messages
- \* **GDSTAT** Get the status of one or more guaranteed delivery messages
- \* **GETUSR** Get the name of the original source of a given chain of AP's

**Privileged Services**

- \* **INICOM** Provide initiation services for the COMM APs
- \* **INITEX** Provide initiation services for UI AP
- \* **LOGON** Send IISS user Logon information to NTM
- \* **LOGOFF** Send IISS user Logoff information to NTM
- \* **TRMNAX** Signal Comm AP Termination Status
- \* **CHGROL** Change the user's role during a session

Figure 4-4. NTM Service Calls

\* Services available in Release 2.0



1. In implementation, APs that can process NTM commands (i.e., shutdown) will have three input mailboxes. The second input mailbox will be used to receive these high priority unsolicited messages from the NTM while the third is reserved for Message Acknowledgements from the NTM.

Figure 4-5. The AP's Interface

An AP that is to be integrated into the IISS and use the message services of the NTM must be written according to a format that includes NTM Initiation (INITAL) and termination (TRMNAT) calls at the beginning and the end of its Procedure Division (COBOL) as shown in Figure 4-6. The CALL "INITAL" and CALL "TRMNAT," respectively, provide the IISS connection and termination service. Communication between IISS APs is accomplished by using the NTM calls that are described in Section 5 of the IISS Programmer's Guide [8]. For example, the CALL "NSEND" USING ..., will cause a program's message to be delivered to the NTM for routing. The NTM routes the messages through the IISS to the destination AP. The destination AP receives its messages by using the NTM "RCV" call.

#### 4.1.2.2 NTM Interface for Existing Applications

An NTM interface for existing ICAM applications (i.e., MCMM and MRP) will be designed to minimize any required changes to the APs for interfacing. The NTM interface for existing APs:

- a. Shall include an initiation routine 'INI---' that may be specific to each application. It will provide NTM connection logic for the AP.
- b. Will, in some manner, take I/O from the program's DISPLAY call and formulate an NTM message from the data and deliver it to a User Interface AP (UI) for display on a non-local terminal request.
- c. Will take and deliver a message from a UI for the application and unpack the received data to return to the program on its CALL ACCEPT.
- d. Shall include a termination routine "TRM---" that will disconnect the AP from the NTM.

Initial research into the MCMM and MRP cases indicate that a generic NTM interface will not be possible for them.



AP PROGRAM

PROCEDURE DIVISION.

CALL "INITAL" USING BUFFER,  
BUFFER-SIZE,  
SYSTEM-STATE,  
RET-CODE.

...

AP CODE: can include NTM calls that are  
described in the IISS Programmer's  
guide [8] to communicate with the  
IISS.

...

CALL "TRMNAT" USING TERMINATION-STATUS.\*

\*CALL "TRMNAT" is the last statement in the AP.

Figure 4-6. IISS AP-COBOL Procedure Division Structure

#### 4.1.2.3 NTM Interface to the CDM AP's

The Communication (or COMM) AP cluster will support a COMM application process for each host connection. They are handled in a slightly different manner from other AP's. These differences are noted below. The COMM AP cluster on the VAX host is conceptually represented in Figure 4-7. These COMM AP's are not part of the NTM.

Because the COMM APs perform many of the AP Interface functions directly, they will have only a selected set of AP Interface routines bound to them.

The NTM Interface for the COMM APs is the following:

##### Services

- a. COMM will use the NTM initiation routine,  
  
CALL "INICOM" USING event-block,  
                                  input-mailbox-name,  
                                  cluster-hot-mailbox name,  
                                  cluster-cold-mailbox name,  
                                  status.  
  
INICOM will
  - create the COMM's input mailbox
  - establish an IISS exception handler for COMM
  - return the names of the COMM AP's input mailbox and the names of the two cluster mailboxes.
- b. COMM-NTM Communication - The COMM AP's will use, directly, the IPC primitives, to send and receive messages from the NTM. On receiving a message from the NTM it will inspect the destination AP name in the header to determine whether the message is for it or to be sent to its remote host. Messages for COMM and the COMM-NTM protocol are given in Figure 4-8.
- c. COMM will use the NTM termination routine, "TRMNAT" [8], to end its execution. It calls "TRMNAT" on the receipt of a "TR" message from the NTMs MONITOR AP.

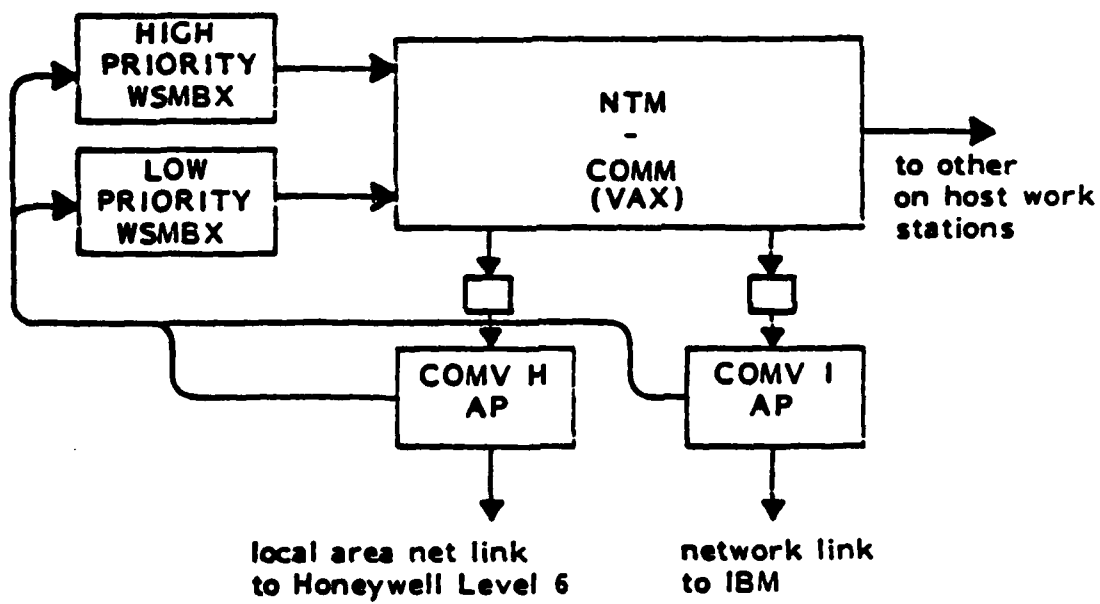


Figure 4-7. The COMM AP/NTM Interface

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Message to a COMM AP  
from the NTM's Monitor AP

Action by the COMM AP

Message Types

- |                            |                                                                                                                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a)    "SL" (start link)    | COMM attempts to start the link to its remote host. Responds with "LA" - link active message or "LF" - link fail                                                                                    |
| b)    "SD" (shutdown link) | COMM shuts down (stops listening to) remote host and responds with "LF"                                                                                                                             |
| c)    "TR"                 | COMM calls the NTM termination routine "TRMNAT" to end execution                                                                                                                                    |
| d)                         | <p>A COMM may send the following unsolicited messages to the NTM's MONITOR AP.</p> <p>"RE", recoverable error with five character error code in the data field</p> <p>"LF", a link fail message</p> |

Figure 4-8. COMM AP/NTM Protocol

#### 4.1.2.4 NTM Interface to the User Interface (UI)

The User Interface (UI) is the application process that interfaces to the IISS user terminals. Initially, there will be one UI per IISS terminal with a number of UIs associated with one work station. Conceptually, the NTM-UI Interface is depicted in Figure 4-9.

The connection protocol of these terminals causes this APC to be handled in a slightly different manner than other APCs. However, this difference is transparent to the UI APs. The UI (AP) Interface and the NTM protocols handle this special requirement by providing the necessary NTM connection logic on the UI's initiation call, CALL "INITEX" [8]. The services of INITEX are described below. This implementation is specific for the VAX under VMS.

##### UI-NTM Initiation Service (INITEX)

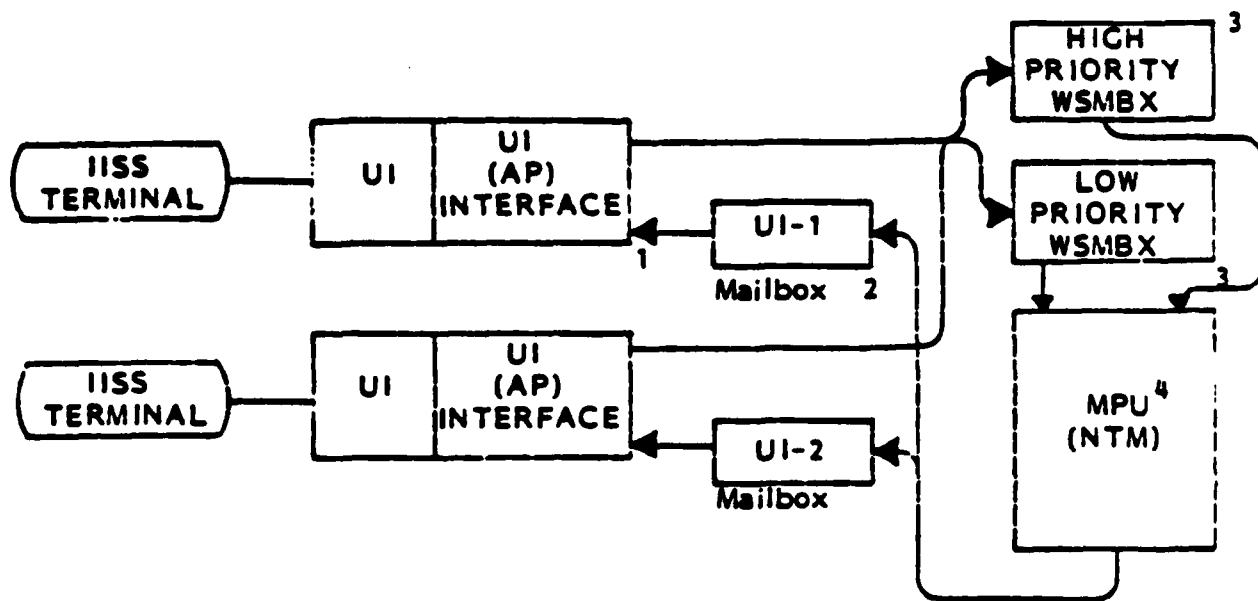
The UI requires an "external" initiation connection service that is supplied by the routine "INITEX." This allows a user to logon to an IISS terminal and initiate a UI process from a logon command file. The UI must connect to the NTM, rather than the NTM initiating the UI as in the normal IISS process initiation procedure. External connection is required in light of the way that the UI will manage the terminals. INITEX performs the following initiation functions for the UI.

1. Sends an "I'm alive" message that contains the UI's operating system given process name to the UI's NTM.
2. Creates the UI's input mailboxes.
3. Establishes the IISS exception handler for the UI.
4. Saves the UI's buffer address and buffer size for later message services.
5. Returns to the UI with the status of the initiation.

##### The UI and Logical-Channels

-----

A UI will manage communications between the NTM and any



1. UI represents the UI code.  
UI (AP) Interface is the special AP Interface for the UI.  
The UI code is bound with the UI (AP) Interface.
2. The UI-1 Mailbox is the Input mailbox for the first instance of the UI.
3. These represent the work stations high and low priority mailboxes.
4. The MPU is the Message Processing Unit of the NTM.

Figure 4-9. NTM-UI Interface

terminals connected to it (initially only one terminal will be supported by a UI AP). The logical channel specifier provides a mechanism for the UI to map messages to terminals, or to multiple screens on a given terminal. The UI can manage the mapping between messages and screens or terminals by maintaining a table that carries the current channel assignments for a terminal or screen and using the channel numbers as suggested in [8].

The requirement for an AP to be able to send an unsolicited form to a terminal can be supported by the use of a specified channel for UI unsolicited messages (channel 0 is being reserved for these unsolicited messages for single-terminal UIs).

Multiterminal UIs can also be supported by the NTM in the future with a slight modification to the INITEX routine. The UI will assign blocks of channel specifiers to a terminal when the terminal logs on. The NTM will need to know the channel numbers associated with a logon, and will provide a message format for this data when multiterminal UIs are developed.

#### UI-NTM Interface Programming Conventions

-----

The UI must use the following guidelines to communicate successfully in the IISS Test Bed.

1. It must be bound with the UI (AP) Interface supplied by the NTM.
2. It must initiate communications with the NTM with a 'CALL "INITEX" USING...
3. It must support asynchronously received (unsolicited) messages using CALL "RCV" or CALL "CHKMSG" and CALL "RCV" at regular intervals.
4. It must handle "shutdown" messages, including shutdown pending, cancel shutdown, and its own shutdown procedures.
5. If the IISS is in a recovery or down state, the UIs will get a "connection-failure-reason" status return on the CALL "INITEX." It should inform the terminal of the state of the IISS and provide a logoff or local mode capability to the user.

6. It must use the NTM Service Calls [8] to communicate with other IISS APs.
7. It should terminate with the NTM call, "TRMNAT".

#### 4.1.2.5 NTM Interface to the IISS Operator

The NTM shall interface to an IISS Operator's Console. Initially, the interface will exist only on the VAX and will be implemented as a direct link from the operator's console to the NTM's Monitor AP (Figure 4-10). An early enhancement will be an IISS Operator's Interface through a UI to enable the use of forms and screen displays by the IISS Operator.

- a. The initial test bed shall support the following IISS Operator Commands during IISS operation.
  1. Start IISS
  2. Start APC
  3. Start Link
  4. Shutdown APC
  5. Shutdown IISS
  6. Cancel IISS Shutdown
  7. Display Active APs
  8. Display IISS Status
  9. Enable SIGERR Messages
  10. Disable SIGERR Messages

The MONITOR shall provide prompts to the operator to obtain the data required for each command. For example, the following is the START LINK scenario on the VAX.

|                                                |                  |
|------------------------------------------------|------------------|
| > SL                                           | Operator's Entry |
| Enter Link ID:                                 | Monitor Prompt   |
| > VH                                           | Operator's Entry |
| (Terminal Locked out during command Execution) |                  |
| COMM LINK VH IS ACTIVE.                        |                  |
| > (a new command may now be entered)           |                  |

- b. NTM status information sent to the MONITOR AP from any of the MPU's that may require an operator's action shall be displayed on the operator's console.
- c. For the initial test bed, the IISS is started by a START IISS command entered by an operator on each IISS



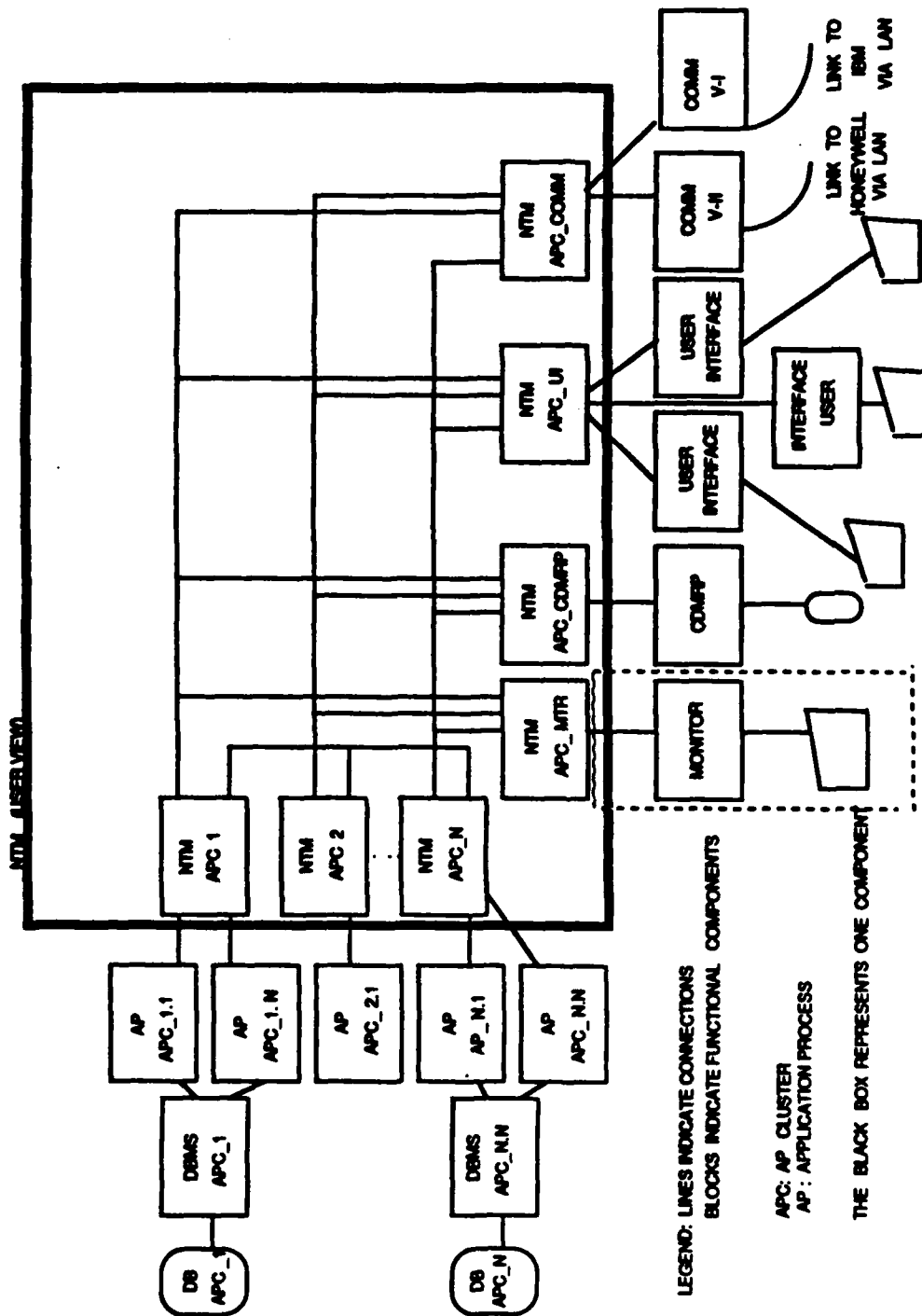


Figure 4-10. IIS Operator's Interface

host. The START IISS command will initiate a command file that starts the MONITOR AP on each host. The MONITOR APs then startup the other NTM modules and APCs on their hosts and cooperate to connect the other IISS hosts to complete the startup.

#### 4.1.3 Internal NTM Interfaces

Three components (Monitor, MPU, and AP Interface) communicate among themselves through mailboxes via well defined messages. These messages have been defined by type and are thoroughly defined in Appendix E. Each message carries a header and an optional data portion. The header provides the essential processing information needed by the destination component. The data portion is reserved for specific backup information pertinent to the relevant message type.

| Field Name                 | Field Size | Field ID   |
|----------------------------|------------|------------|
| Header Format Indicator    | X          | HDR-HDRFMT |
| Header Length              | X(3)       | HDR-HDRLEN |
| Data Length                | X(4)       | HDR-DATLEN |
| Binary/Native Flag         | X          | HDR-BINNAT |
| Message Priority           | X          | HDR-MSGPRY |
| Message Type               | X(2)       | HDR-MSGTYP |
| AP Name (Destination)      | X(10)      | MD-APNAME  |
| Instance (Destination)     | X(2)       | MD-INSTNC  |
| APC Name (Destination)     | X(3)       | MD-APCNME  |
| AP Name (Source)           | X(10)      | MS-APNAME  |
| Instance (Source)          | X(2)       | MS-INSTNC  |
| APC Name (Source)          | X(3)       | MS-APCNME  |
| Message Serial Number      | X(7)       | HDR-MSGSN  |
| Processing Code            | X          | HDR-PROCDE |
| Message Category           | X          | HDR-MSGCAT |
| AP Priority                | X          | HDR-APPRTY |
| Integrity Check Flag       | X          | HDR-INTCHK |
| Log Requirement            | X          | HDR-LOGREQ |
| Statistics Collection Flag | X          | HDR-STATCO |
| Test Flag                  | X          | HDR-TSTFLG |
| Delay Trigger Flag         | X          | HDR-DELTRG |
| Delay Time Trigger         | X(15)      | HDR-TRGTIM |
| Delay Trigger Condition    | X          | HDR-TRGCON |
| Original Source            | X(15)      | HDR-ORGSRC |
| Logical Channel ID         | X(3)       | HDR-CHANID |
| Continuation Indicator     | X          | HDR-CONIND |

Figure 4-11. Header Format

#### 4.1.3.1 Message Header

The message header carries the relevant information about the message throughout the NTM. The header is formatted by the AP Interface at the message source AP. The MPU fills in the field values it is responsible for and performs the integrity checks on the other header fields. The completed header stays with the message until it reaches its destination. The Header Format is shown in Figure 4-11. Each field is defined below.

| <u>Field Name</u>       | <u>Field Value<br/>Supplied By</u>                                         | <u>Field Description</u>                                                                                                                                                                                                                       |
|-------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Header Format Indicator | AP Interface, MPU or Monitor AP (depending upon the source of the message) | Identifies the particular format of the given message header. For the test bed there is only one format although future enhancements may require other formats. The value contained in this field maps to its definition in the Data Division. |
| Header Length           | AP Interface, MPU or Monitor AP (based on Header Format)                   | Identifies the length of the given header format. The value is given as number of bytes.                                                                                                                                                       |
| Data Length             | Message Source AP (may be any AP on the IISS including Monitor and an MPU) | Identifies the length of the data portion of the message. The value is given as number of bytes.                                                                                                                                               |
| Binary/Native Flag      | Message Source AP (or default)                                             | Indicates whether the data portion of the of the message is                                                                                                                                                                                    |

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| <u>Field Name</u>                          | <u>Field Value<br/>Supplied By</u>                                                                         | <u>Field Description</u>                                                                                                                                                                   |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            |                                                                                                            | encoded in binary or native mode. The default value on any message is always to native mode.                                                                                               |
| Message Priority                           | Source MPU (based on Message Category)                                                                     | Identifies the priority of the message. The value is obtained by the MPU from the Message Category Table.                                                                                  |
| Message Type<br>can only be<br>by the NTM. | Message Source AP<br>(Note: This value cannot be derived - it can only be provided by the message source)  | Identifies the nature of the message. See Section 10.5 for the specific message types used by the NTM. The source AP is free to choose its own message types as defined by AP-AP protocol. |
| AP Name<br>(Destination)                   | Message Source AP<br>(Note: This value cannot be derived, it can only be provided by the message source.)  | Identifies the Application Process to which the message is directed.                                                                                                                       |
| Instance<br>(Destination)<br>(Destination) | AP Interface (Note: this field is optional, as a destination instance may not exist when message is sent.) | Identifies the specific occurrence of the Destination AP to which the message is the directed, when known.                                                                                 |
| APC Name<br>(Destination)                  | Source MPU                                                                                                 | Identifies the AP Cluster upon which the destination AP resides. This value is generally obtained                                                                                          |

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| <u>Field Name</u>    | <u>Field Value<br/>Supplied By</u> | <u>Field Description</u>                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                    | from the AP<br>Information Table. The<br>exceptions are in the<br>cases where:<br><br>a. The Destination AP<br>is an IISS Component<br>(whose APC Names are<br>known to all MPU's)<br>b. The Destination AP<br>is an MPU. In this<br>case, the APC Name is<br>always the last three<br>characters of the<br>MPU's Name.<br>c. The source AP has<br>received a message<br>from the destination<br>and therefore knows<br>the destination APC. |
| AP Name (Source)     | AP Interface                       | The source of the<br>given message.                                                                                                                                                                                                                                                                                                                                                                                                          |
| Instance<br>(Source) | AP Interface                       | The specific<br>occurrence of the<br>message source AP.                                                                                                                                                                                                                                                                                                                                                                                      |
| APC Name<br>(Source) | AP Interface                       | The APC upon which the<br>source AP resides.                                                                                                                                                                                                                                                                                                                                                                                                 |
| Message<br>Serial #  | Source MPU                         | A unique APC number<br>that, when<br>concatenated with the<br>source APC<br>name, provides a<br>unique message<br>identifier for the<br>given message through-<br>out the IISS.                                                                                                                                                                                                                                                              |

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| <u>Field Name</u>             | <u>Field Value<br/>Supplied By</u>                         | <u>Field Description</u>                                                                                                                                                                             |
|-------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processing Code               | AP Interface or<br>Default                                 | Identifies whether the<br>given header is "used"<br>or new. If "used" it<br>is assumed to be<br>correct and does not<br>require integrity<br>checking. The default<br>is always set to "0"<br>(new). |
| Message Category              | AP Interface (de-<br>rived from Call<br>'SEND' Parameters) | Defines special<br>processing<br>to be performed by the<br>MPU. See Sections<br>4.5.3.1 and Appendix E<br>for details.                                                                               |
| AP Priority                   | Source MPU                                                 | Identifies the<br>relative priority of<br>the source AP. Its<br>value is obtained from<br>the AP Characteristics<br>Table.                                                                           |
| Integrity Check<br>Flag       | Message Source AP<br>or Default                            | Indicates whether an<br>integrity check is to<br>be performed on the<br>data portion of the<br>message. The default<br>is always set to "0"<br>(No).                                                 |
| Log Requirement               | Source MPU                                                 | Indicates whether the<br>message is to be<br>logged at every MPU it<br>arrives at. The value<br>is obtained from the<br>Message Category<br>Table.                                                   |
| Statistics<br>Collection Flag | Source MPU                                                 | Indicates whether<br>statistics are<br>to be collected on the                                                                                                                                        |

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| <u>Field Name</u>  | <u>Field Value<br/>Supplied By</u> | <u>Field Description</u>                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                    | message. The value is obtained from the Message Category Table.                                                                                                                                                                                                                                                                                                                                       |
| Test Flag          | Message Source AP                  | Indicates whether the source AP is operating in regular or test mode. This is set/reset by the User Interface. If set, the UI is running in "System Mode" and will receive all asynchronous error messages from the AP and will display them on the message line. If the test mode flag is reset, the asynchronous error messages are only logged in the error log and not displayed on the terminal. |
| Delay Trigger Flag | Message Source AP or Default       | Defines when the Flag message is to be delivered to its destination AP. The default is always set to "0" (No Delay).                                                                                                                                                                                                                                                                                  |
| Delay Trigger Time | Message Source AP or Default       | Identifies the time constraint associated with the delay trigger. Where a time constraint is not applicable, this field will be filled with blanks (default).                                                                                                                                                                                                                                         |

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| <u>Field Name</u>          | <u>Field Value<br/>Supplied By</u>                | <u>Field Description</u>                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delay Trigger<br>Condition | Message Source AP<br>or Default                   | Identifies the condi-<br>tional constraint<br>associated with the<br>delay trigger. Where<br>this constraint is not<br>applicable, the field<br>will be filled with<br>blanks (default).                                                                                                                                                                                                                      |
| Original Source            | AP Interface                                      | Identifies the<br>Original Source (root<br>AP) of the Message<br><br>Source AP. This value<br>is generally obtained<br>from the AP Status<br>Table. The exception<br>is for messages<br>conforming to Category<br>F. In that<br>case, the value is<br>obtained from the<br>corresponding field of<br>the relevant Category<br>B, D, or J message.<br>See Appendix E for<br>details on the use of<br>Category. |
| Logical Channel<br>ID      | Original source AP<br>AP or the AP Inter-<br>face | On messages conforming<br>to Category B, D, or J<br>the logical channel ID<br>identifies the channel<br>upon which the reply<br>message is to be<br>returned. (Note: the<br>channel will either be<br>source specified or<br>defaulted to the<br>channel under which<br>the source AP was ini-<br>tiated). On Category H<br>messages, this field<br>will contain the                                          |



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| <u>Field Name</u>      | <u>Field Value<br/>Supplied By</u> | <u>Field Description</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                                    | channel ID under which the target AP is to be initiated. On Category F messages, this field will contain the channel ID specified in the original B, D, or J message (i.e., the Field request message to which the reply is being made). For A, C, E or G messages, the channel ID value will be the one under which the message's source AP was initiated. The source AP's channel ID is obtained from the AP status table. See Appendix E for details on the use of Category. |
| Continuation Indicator | AP Interface                       | Identifies whether the message is continued or stand alone.                                                                                                                                                                                                                                                                                                                                                                                                                     |

#### **4.1.3.2 The Monitor AP**

The Monitor AP (Figure 4-12) is a component of the NTM that resides on each IISS host on a cluster that is dedicated to this AP. It is an IISS Application Process whose functions are illustrated in the node tree in Figure 4-12.

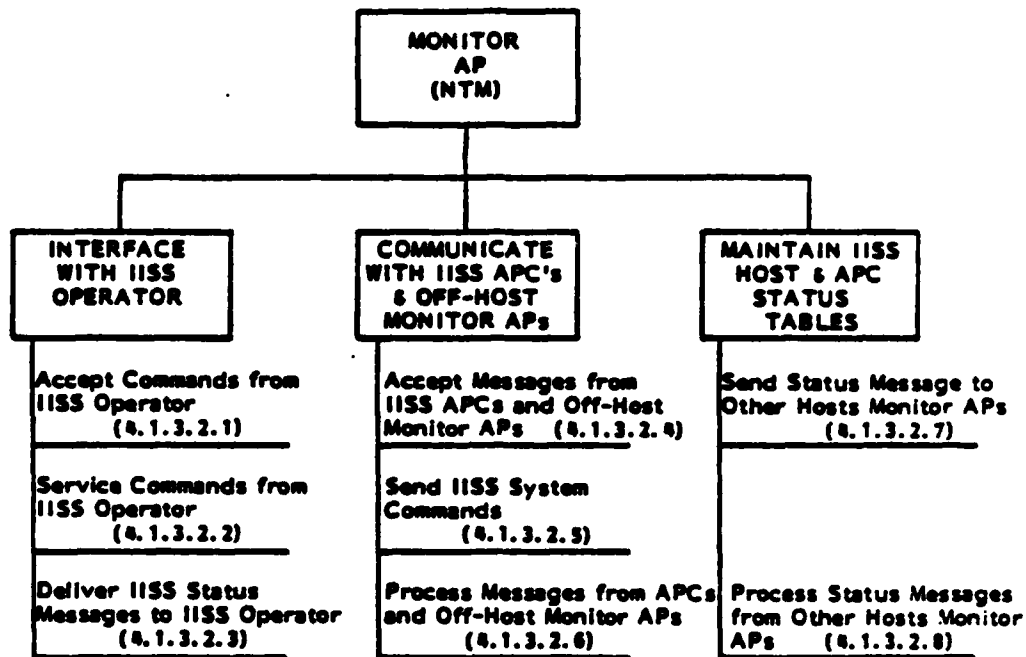


Figure 4-12. Monitor AP Functions

**4.1.3.2.1 Accept Commands from the IISS Operator**

The commands that will be accepted from the Operator's console in the initial Test Bed are listed in 4.1.2.5.

**4.1.3.2.2 Service Commands from the IISS Operator**

The processing that is provided on each of the supported IISS operator's commands is described below.

**START IISS ON VAX:**

1. Monitor AP is spawned as a result of the start IISS command from the operator.
2. Monitor reads its startup file to determine the current Sysgen Parameters. Among the parameters is the current table configuration. Monitor compares the current Operating configuration ID to its old value and sets a flag that indicates whether tables and local files are up-to-date.
3. Monitor creates its input mailbox.
4. It spawns its APC's MPU.

5. It waits for a "Table Status Request" message from the spawned MPU.
6. On receipt of the "Table Status Request" message, the Monitor always sends a "Tables OK" message to its MPU and then waits for an "I'm Alive" message from the MPU. The Monitor MPU's tables will be started up using the tables that they had when they were shut down. If changes have been made in the system data stored in the CDM while the MPU was shutdown, the tables may be wrong, but at least adequate to startup. After the CDM cluster is up, the tables can be updated if necessary. Note: The table logic associated with the storage of tables in the CDM was not implemented in Release 2.0.
7. On receipt of the "I'm Alive" message, the Monitor updates the Monitor's APC status in the APC Status Table to "cluster-up".
8. Monitor sends the active APC a "Host Active" message to indicate that the APC's startup is complete and it's normal processing can begin.
9. The Monitor AP spawns the CDM cluster by sending a 'start APC' message to its MPU which will now spawn the CDM MPU. It now repeats steps 5-7 for the CDM cluster, except it will now send the correct table status to the CDM cluster ("Tables OK" to indicate that there have been no changes in the system database definitions of the tables so the tables being used at shutdown are ok, or "Tables Obsolete" to indicate that changes have been made and that new tables should be called for. Note: The logic for storage of table information in the CDM was not implemented in Release 2.0.)
10. If the current table configuration ID is not equal to the old ID, the Monitor AP sends requests for new tables to the CDMRP and then sends a "Rebuild Table" message to its MPU so that the MPU can rebuild the tables.
11. If any of the above steps encounters an unrecoverable error, the Monitor AP will send a message to the operator and end execution.
12. The Monitor, now with correct tables, sends a 'START APC' message to its MPU to startup the UI cluster (then, does

Steps 5-8 again, sending the correct table status). If this fails, the Monitor AP informs the operator and terminates the IISS.

13. Other clusters, indicated by the Monitor AP's tables, are started by a "start APC" message followed by Steps 5-8. This time, however, a failure only causes a status message to be sent to the operator and an update to the Monitor AP's Status Tables.
14. The Monitor AP next starts the Network Communications by sending Initiate COMM AP messages to the COMM cluster. These are followed by Start Link messages to the COMM APs. The link status message will be received and handled as part of Monitor's regular processing operations.
15. The Monitor AP updates its Host table entry to Active. "Host Available Messages" that include the host active APC names will be sent to any remote hosts once a link is established with the VAX.

START IISS ON NON-VAX HOSTS:

1. It is assumed that non-VAX startups will be initiated at the system operator's console.
2. Steps 1-6 of the VAX startup are performed.
3. The link to the VAX is started as in Step 14 with only one difference: the Monitor AP will always send a "Tables OK" message to the COMM MPU. If the start of the link to the VAX is unsuccessful, the non-VAX startup has failed, a status message is sent to the non-VAX console, and the host startup is terminated.
4. If the link to the VAX is successful and the Non-VAX MONITOR receives the "VAX Host Available" message sent in step 15 above, the Non-VAX MONITOR AP rebuilds its tables and, if necessary, sends rebuild table messages to the MONITOR and COMM MPUs. (The MONITOR AP and the MPU's use of the off-host table rebuild protocol is TBD).
5. If host tables were rebuilt from the CDM, the MONITOR AP waits for "Table Rebuilt" Status messages from the COMM and MONITOR AP MPUs.

If table processing fails, the MONITOR AP informs the

operator and terminates the IISS component on the non-VAX host.

6. When the non-VAX NTM tables are built, the local APCs to be initiated are started as they are on the VAX. An initiation error here is not a fatal IISS error.
7. The remaining network links are started and "Host Available" messages are sent as in Step 15 of the VAX Startup.

START APC (VAX only, while IISS is running):

1. Monitor prompts the Operator for the APC name.
2. The operator enters an APC selection.
3. If the selection is valid, the Monitor AP determines the host location of the APC.
4. If the APC is off-host and the destination host is running, the MONITOR AP sends a "START APC" command to the correct off-host Monitor AP MPU. If the host is not active, the Monitor AP sends a "APC's Host is not active" message to the operator.
5. If the APC is on-host, the Monitor AP sends a 'START APC' command to its MPU and performs the protocol of Steps 5-8 in the IISS Startup Procedure (p. 4-27).

START LINK (VAX only while IISS is running):

1. Monitor prompts the Operator for a link ID.
2. The operator enters a link ID.
3. If the selection is valid, the monitor AP checks to see if the COMM APC is available, if it is not:
  - 3a. It sends a "Start COMM APC" message to its MPU
  - 3b. The Monitor checks the status of the COMM AP.
  - 3c. If the COMM AP is not active, the MONITOR then sends a "Start Comm AP" Message followed by a

"Start Link" message to the COMM AP. If the COMM AP is active, only the "Start Link" message is sent.

- 3d. Upon receiving the link status from the COMM AP, the MONITOR AP displays the new link status to the operator.

If the COMM APC is available, Steps 3b, 3c, and 3d are performed.

SHUTDOWN APC (on VAX only):

1. The MONITOR prompts the Operator for the APC name.
2. The operator enters the APC name.
3. If the selection is valid, the operator sends a "SHUTDOWN APC" message to the APC.
4. On a Shutdown Status" message from a VAX APC or an "Update APC Table" message from a non-VAX Monitor AP if the APC was off host, the Monitor AP sends a status update message to the operator.

SHUTDOWN IISS (on VAX only):

1. The MONITOR AP requests the time until shutdown from the operator.
2. If the time until shutdown is not immediate, the MONITOR AP sends "Shutdown Pending" status message to the UIs at one minute intervals. If shutdown is immediate step 3 is ignored.
3. Before the time until shutdown expires, the MONITOR AP will accept only "CANCEL IISS SHUTDOWN," "DISPLAY IISS STATUS", "HELP", or "DISPLAY ACTIVE APs" commands from the operator.
4. When the time until shutdown has elapsed, the VAX MONITOR AP sends "SHUTDOWN IISS" messages to the non-VAX MONITOR APs, sets its status to "IISS Shutting Down", and sends "SHUTDOWN APC" messages to each active on-host non-component APC.

5. Each non-VAX Monitor AP on receiving the Shutdown Command sends "Shutdown APC" messages to its APCs (except COMM). When all of the APC's "APC Shutdown" messages have been received, the non-VAX Monitor AP sends a message to the VAX Monitor AP announcing the host shutdown, then shuts down COMM, its MPU and finally itself.
6. When the VAX Monitor AP has received all "IISS host shutdown" and local "APC Shutdown" messages, or has timed-out on any of these, it shuts down the VAX COMM AP's, the COMM APC, its MPU, sends a final status message to the operator, saves its tables, closes its files, and ends execution.
7. Throughout the shutdown IISS process, the Status Messages from off-host and local APC shutdowns are sent to the operator.

SHUTDOWN HOST (on VAX only):

1. The Monitor AP displays the active host names (not VAX\*) to the operator.
2. The operator selects the desired host.
3. The VAX Monitor AP sends a "Shutdown Host" message to the off-VAX Monitor AP.
4. Each non-VAX Monitor AP, on receiving the Shutdown Command sends Shutdown APC messages to its APCs (except COMM). When all of the APC's "APC Shutdown" messages have been received, the non-VAX Monitor AP sends a message to the VAX Monitor AP announcing the host shutdown, then shuts down COMM, its MPU and finally itself.
5. On receiving the "Host Shutdown" message, the VAX Monitor AP, shuts down the COMM AP for the link to the shutdown host, updates its status table to indicate the status of the shutdown host, sends a status message to the operator, and a "Host Status Update" message to all of the other active IISS hosts Monitor APS.

\*To shutdown the VAX, a Shutdown IISS command must be issued.

CANCEL IISS SHUTDOWN:

1. The Monitor accepts the command and sends a "Cancel Shutdown" message to the UIs, and then updates its status from IISS Shutting Down to IISS Active. This command only applies during the time that shutdown is pending. Once actual shutdown procedures begins, it cannot be cancelled.

ABORT AP (VAX only):

1. The operator enters AP name to be shutdown (the operator finds active AP names from the DISPLAY ACTIVE AP command).
2. If the AP Name is legal, the MONITOR AP sends the ABORT AP message to the correct APC.
3. On receipt of the AP abort status message, the MONITOR AP displays the status to the operator.

DISPLAY ACTIVE APs (VAX only):

1. On receipt of this command, the Monitor AP sends a message to the active APC entered by the operator requesting a list of the active APs on that APC.
2. On receiving the active list message from the APC, the list is displayed for the operator.

DISPLAY IISS STATUS (VAX only):

1. On receipt of this command, the Monitor AP displays its host and APC Status tables to the operator.

4.1.3.2.3 Deliver IISS Status Messages to the IISS Operator

This function is responsible for displaying IISS status and error messages to the IISS operator on the VAX. These are messages signalling events that might require some operator action. If the Monitor AP cannot write to the IISS operator's console from which it was started, it will attempt to write a message to the System Console.



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**4.1.3.2.4 Accept Messages from IISS APC's and Off-Host Monitor  
APs**

This function is responsible for accepting messages from IISS APC's and off-host Monitor APs. The messages that can be received during the various IISS states are listed in Figure 4-13.

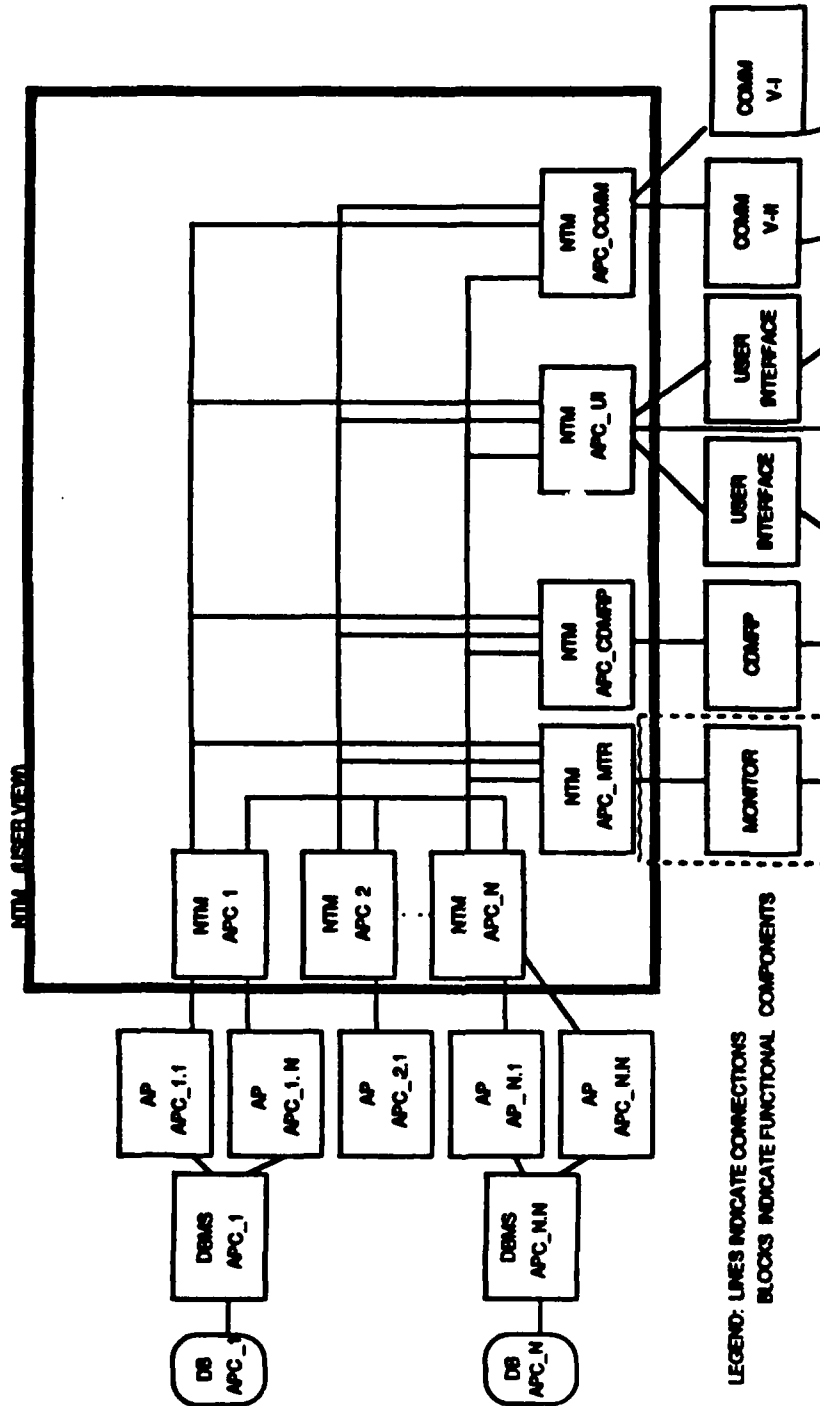


Figure 4-13. IISS Messages Received by the Monitor AP

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**4.1.3.2.5 Send IISS System Commands and Responses**

This function is responsible for creating and sending the IISS system command messages from the VAX Monitor AP to the IISS APC's, APs, and off-host Monitor APs. These messages are created to effect an IISS Operator's command and are listed in Figure 4-14. See Appendix E for the specific format of these messages.

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| <u>IISS System<br/>Command/Response</u> | <u>Message<br/>Type</u> | <u>Destination</u>                             | <u>When Sent</u>                                 |
|-----------------------------------------|-------------------------|------------------------------------------------|--------------------------------------------------|
| Operator Abort                          | OA                      | APC of<br>Requested AP                         | IISS<br>Running                                  |
| Start Link                              | SL                      | COMM AP                                        | IISS<br>Startup<br>IISS Running                  |
| Cancel Shutdown                         | CS                      | UI APs                                         | IISS Running<br>with IISS<br>Shutdown<br>Pending |
| Start MPU                               | SC                      | Monitor's<br>MPU on<br>requested<br>MPU's Host | IISS Startup<br>Host Shutdown<br>IISS Running    |
| List Request                            | LR                      | All APC's                                      | IISS Running<br>or IISS Shut-<br>down Pending    |
| Shutdown Link                           | SD                      | COMM APs                                       | IISS Shutdown<br>Host Shutdown<br>IISS Running   |
| Shutdown Pending                        | SP                      | UI APs                                         | IISS Running<br>with IISS<br>Shutdown<br>Pending |
| Shutdown APC                            | DC                      | Active APC                                     | IISS Running<br>IISS Shutdown                    |
| Shutdown Host                           | SH                      | Remote - Non-VAX<br>Monitor AP                 | IISS Running<br>IISS Shutdown                    |
| Rebuild Tables                          | RB                      | CDMRP & Monitor<br>MPU on VAX                  | IISS Startup                                     |

Figure 4-14. IISS System Commands and Responses

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| <b>IISS System<br/>Command/Response</b><br>----- | <b>Message<br/>Type</b><br>----- | <b>Destination</b><br>-----            | <b>When Sent</b><br>----- |
|--------------------------------------------------|----------------------------------|----------------------------------------|---------------------------|
|                                                  |                                  | COMM & Monitor<br>MPU on Non-VAX Hosts | IISS Startup              |
| Display System<br>Status                         | DS                               | Monitor AP                             | IISS Running              |

Figure 4-14. IISS System Commands and Responses  
(Continued)

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**4.1.3.2.6 Process Messages from APC's and Off-Host Monitor APs**

This function processes the messages received by the MONITOR AP. The message types received and the processing performed are in Figure 4-15.

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| <u>Message</u>       | <u>Message Type</u> | <u>Source</u>                             | <u>When Sent</u>                              | <u>Processing</u>                |
|----------------------|---------------------|-------------------------------------------|-----------------------------------------------|----------------------------------|
| Link Active          | LA                  | COMM AP                                   | IISS Startup                                  | Update Table<br>Inform Operator  |
| Link Fail            | LF                  | COMM AP                                   | IISS Startup<br>IISS Running<br>IISS Shutdown | Update Tables<br>Inform Operator |
| Processing Error     | SI                  | IISS APC's                                | IISS Startup<br>IISS Running                  | Inform Operator                  |
| APC Terminated       | CT                  | IISS APC's                                | IISS Startup<br>IISS Running<br>IISS Shutdown | Update Tables                    |
| Logon                | LO                  | UI-AP                                     | IISS Running                                  | Update Logon Table               |
| Logoff               | OF                  | UI-AP                                     | IISS Running<br>or IISS Shutdown              | Update Logon Table               |
| Table Status Request | TS                  | All local APC's                           | IISS Startup<br>or Running                    | Send Table Status Return (ST)    |
| Shutdown Host        | SH                  | VAX Monitor AP                            | IISS Running<br>or IISS Shutdown              | Shutdown Host                    |
| APC Alive            | LV                  | IISS APC's                                | IISS Startup<br>or IISS Running               | Update Tables<br>Inform Operator |
| Resource Unavailable | SS                  | APC's                                     | IISS Startup<br>and IISS Running              | Inform Operator                  |
| AP Interface Error   | SI                  | APC's                                     | IISS Running                                  | Inform Operator                  |
| Tables Rebuilt       | RD                  | MPU's of Monitor, CDMRP or non-VAX COMM's | IISS Startup                                  | Send "Host Alive" Message to APC |
| Timeout Expired      | TE                  | Monitor's MPU                             | Any IISS State                                | Take Timeout Action              |
| Unstable Table       | UT                  | Any MPU                                   | Any IISS State                                | Inform Operator                  |

Figure 4-15. Processing of Messages Received by a Monitor AP (Host Status Messages in 4.1.3.8)

#### 4.1.3.2.7 Send IISS Status Messages

This function is responsible for sending a Monitor AP's IISS status messages to remote Monitor APs and local APC's. The messages to the remote Monitor APs ensure that each IISS Monitor AP has up-to-date IISS status tables. The Status Messages to local APCs inform the APCs of IISS operating conditions and ensures that the APC will know when to perform cleanup functions. The status messages sent by a Monitor AP for this purpose are described in Figure 4-16.



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| Message<br>-----   | Message<br>Type<br>----- | Destination<br>-----  | When Sent<br>-----            |
|--------------------|--------------------------|-----------------------|-------------------------------|
| Update APC Tables  | UA                       | Remote Monitor<br>APs | IISS Startup<br>IISS Running  |
| Update Host Tables | UH                       | Remote Monitor<br>APs | IISS Startup<br>IISS Running  |
| Host Available     | HA                       | Remote Monitor<br>APs | IISS Startup<br>IISS Running  |
| Host Active        | HU                       | Local APC's           | IISS Startup<br>IISS Running  |
| Off-Host Shutting  | HS                       | Local APC's           | IISS Running<br>Host Shutdown |

Figure 4-16. IISS Monitor Status Messages

**4.1.3.2.8 Receive and Process Status Message from Other Hosts**  
**Monitor APs**

This function is responsible for receiving and processing status messages from other Monitor APs. The processing for the two identified messages of this category is described below.

| Message<br>-----   | Message Type<br>----- | Processing<br>-----                   |
|--------------------|-----------------------|---------------------------------------|
| Host Available     | HA                    | Update Tables                         |
| Update APC Tables  | UA                    | Update Tables                         |
| Update Host Tables | UH                    | Update Tables                         |
| Host Terminating   | HT                    | Update Tables<br>Inform Local<br>APCs |

#### 4.2 Detailed Functional Requirements

The node tree shown in Figure 4-17 illustrates all NTM functions defined in the IDEF\O Model (see Appendix B below). Each function name is followed by the subparagraph number where a description of the function may be found.

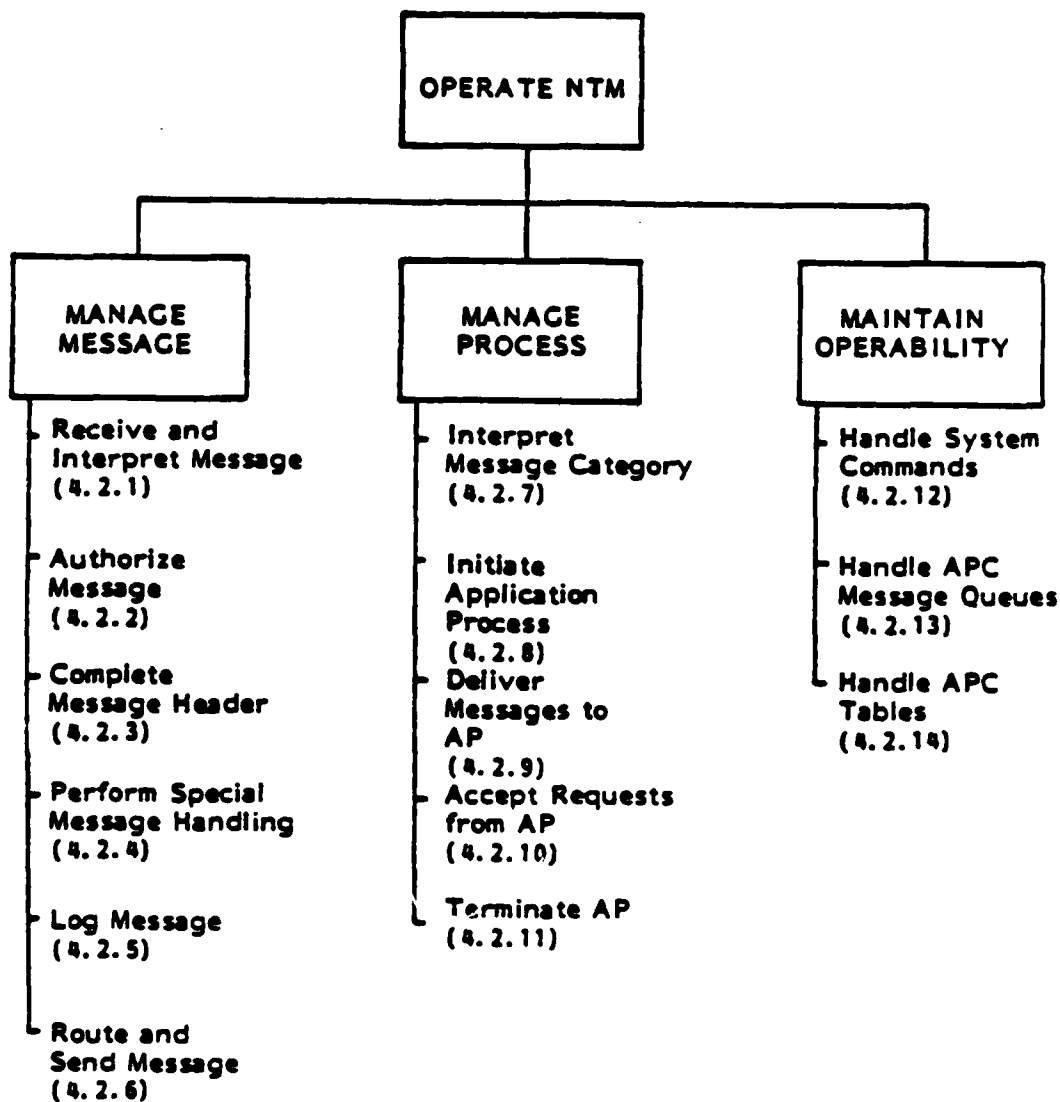


Figure 4-17. NTM Functions

#### 4.2.1 Receive and Interpret Message Function

The Receive and Interpret Message function is responsible for receiving and interpreting all messages from off-cluster that are targeted for this cluster and all messages from on-cluster that must be routed.

##### 4.2.1.1 Inputs

Inputs to this function are as follows:

| Description<br>----- | Source<br>-----                                              | Range<br>----- |
|----------------------|--------------------------------------------------------------|----------------|
| Message              | on-cluster APs<br><br>on-cluster MPU<br><br>off-cluster MPUs | All categories |

Message Category Table    Internal tables

##### 4.2.1.2 Processing

The processing of the Receive and Interpret Message function\* is described below:

- a. Messages shall be received in the APC's input MPU mailboxes from on-cluster APs, from the on-cluster MPU, and from other off-cluster MPUs. If an error is detected in receiving messages from the mailboxes, Receive and Interpret Message shall generate a status message to be sent to the Monitor AP.
- b. A message that has been successfully received at an MPU from another MPU must have its destination field interpreted to determine whether the message has arrived at the correct cluster. The destination field of the message shall be checked for the APC's name or, if being routed through the Communication Handler APC, for a legitimate off-host APC designation. Valid messages from other APCs shall bypass the Authorize and Complete Message Header Functions and be sent directly to Log Message. An

invalid message from off-cluster shall cause a status message to be sent to the Monitor AP.

- c. Messages from on-cluster APs shall indicate whether header be performed by the Manage Message Function. Header checking can be bypassed if a header that has already 'passed' Manage Message is reused by the AP Interface. These messages are sent directly to Complete Message Header to obtain a new serial number.
- d. A message, successfully received from on-cluster and requiring header checking, shall have its category field checked against a table of legal categories. Valid messages shall then be forwarded based on the processing requirements of the message category. Messages that require authorization shall be sent to Authorize Message and messages that do not require authorization shall be sent to Complete Message Header.
- e. Invalid messages shall be given an error code and shall be sent to Log Message.
- f. A message from an on-cluster AP with an invalid category shall cause the generation of a no-accept status return. The no-accept return shall be sent to Route and Send for delivery to the source AP.
- g. All messages from on-cluster (from an AP or from the MPU) with an invalid category shall cause a status message to be sent to the Monitor AP. Since the category field is supplied by the NTM software, a category error implies an NTM software failure.

#### 4.2.1.3 Outputs

Outputs from this function are as follows:

| Description<br>----- | Destination<br>----- | Range*<br>----- |
|----------------------|----------------------|-----------------|
| Received Messages    | Authorize Message    | Category        |

\*All of the functions and their interfaces described in these sections are graphically portrayed in the IDEF\O Model contained in Appendix B below.

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| Description<br>-----                                                  | Destination<br>-----                | Range<br>-----                                                                                                                                                        |
|-----------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Received Messages<br>(Continued)                                      | function                            | A,B,E,H and J<br>messages                                                                                                                                             |
|                                                                       | Complete Message<br>Header function | All Category C,<br>D, F, and G<br>messages from<br>on-cluster to<br>be routed.                                                                                        |
|                                                                       | Log Message function                | All accepted<br>messages from<br>off-cluster<br><br>-and<br><br>All rejected<br>messages                                                                              |
| Send Status on<br>Message and Status<br>Messages to the<br>Monitor AP | Route & Send Message<br>function    | All status<br>messages for<br>the Monitor AP<br>generated by<br>Receive and<br>Interpret<br>function<br><br>-and-<br><br>Send status<br>returns to<br>on-cluster APs. |

#### 4.2.2 Authorize Message Function

The Authorize Message function is responsible for establishing the authority of an application process to issue the specified message type to the specified destination AP.

##### 4.2.2.1 Inputs

Inputs to this function are as follows.

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| Description<br>-----                         | Source<br>-----                         | Range<br>-----                                                                 |
|----------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------|
| Messages Possibly<br>Requiring Authorization | Receive & Interpret<br>Message Function | Category A,B,E,<br>and H Msgs (Msgs<br>Requiring<br>Possible<br>Authorization) |
| Authority Check<br>Table                     | Internal Table                          | N/A                                                                            |
| Authority Table                              | Internal Table                          | N/A                                                                            |

#### 4.2.2.2 Processing

The processing is described below:

- a. A message arriving at Authorize Message is first checked for an authorization requirement. The message destination is checked against the Authority Check Table to determine if the destination AP has any authorization requirements. If authorization is not indicated, the message is sent to Complete Message Header.
- b. A message that requires authorization shall have its message type, source AP and destination AP combination checked against the Authority Table that contains a list of message types that are valid between the specified source and destination APs. A valid message is sent to Complete Message Header.
- c. Invalid messages shall be given a status indicating an authorization error and be sent to Log Message.
- d. Authorize shall also generate a status return to be returned to the originator of the invalid message. This return shall be sent to Route and Send.
- e. Table access errors shall cause a status message to be sent to the Monitor AP.
- f. If the destination AP is not found in the tables, an invalid destination message will be sent to the source of the message.

#### 4.2.2.3 Outputs

Outputs from this function are as follows:

| Description<br>-----                                                  | Destination<br>-----                | Range<br>-----                                                                                                                     |
|-----------------------------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Authorized Messages                                                   | Complete Message<br>Header function | Authorized<br>Category A,<br>B, E, H, and J<br>messages                                                                            |
| Messages That Did<br>Not Require<br>Authorization                     | Complete Message<br>Header function | Category A, B,<br>E, H, and J<br>messages with<br>no authori-<br>zation require-<br>ment                                           |
| Send Status on<br>Message and Status<br>Messages to the<br>Monitor AP | Route & Send Message<br>function    | "Authorization<br>Denied" status<br>return<br><br>Table error to<br>Monitor AP.<br>Invalid<br>Destination<br>error to source<br>AP |
| Messages rejected<br>by MM                                            | Log Message Function                | Rejected<br>messages                                                                                                               |

#### 4.2.3 Complete Message Header Function

The Complete Message Header function is responsible for supplying message header information.

##### 4.2.3.1 Inputs

Inputs from this function are as follows:



| Description<br>-----                                                       | Source<br>-----                  | Range<br>-----                                                                                                                  |
|----------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Authorized Category<br>A, B, E, H, and J<br>Messages                       | Authorize Message<br>Function    | Authorized<br>Messages                                                                                                          |
| Category A, B, E, H, J<br>Messages with No<br>Authorization<br>Requirement | Authorize Message                | Category A, B,<br>E, H, and J<br>messages with<br>no authority<br>requirement                                                   |
| Category A-J<br>Messages                                                   | Receive and Interpret<br>Message | Category A, B,<br>E, H, J mes-<br>sages that do<br>not require<br>Header<br>verification<br><br>Category C, D,<br>F, G messages |
| Message Category<br>Table                                                  | Internal Table                   | N/A                                                                                                                             |
| AP Information<br>Table                                                    | Internal Table                   | N/A                                                                                                                             |
| AP Characteristics<br>Table                                                | Internal Table                   | N/A                                                                                                                             |
| Message-Serial-Number                                                      | Internal Data Item               | 1-9,999,999                                                                                                                     |

#### 4.2.3.2 Processing

- a. For messages that require header verification (header processing flag = '0'), Complete Message Header checks the required header fields supplied by the AP Interface from APC tables and data from the AP's Service Call. If any required field is blank, the message is invalid. (Send status will indicate 'Header Processing Error'). Since this error may indicate an NTM failure, a status message will also be sent to the Monitor AP indicating an

**'MPU Processing Error.'**

- b. For messages requiring header verification, the Source MPU next supplies all of the remaining MPU header values except a message serial number to the message header. (See Section 4.1.3.1 for a description of the header values.) If the MPU cannot find any required field entry for the AP in its tables, the message is invalid. (Send status indicates 'Table Entry Not Found Error').
- c. The MPU, on messages requiring header verification, may supply default values for the following header fields: Binary/Native Flag, Integrity Check Flag, Test Flag, Delay Trigger Flag, Delay Trigger Conditions, and Logical Channel ID.
- d. A message serial number is supplied to the header of all messages processed by Complete Message Header. This serial number, with the APC name of this cluster, forms a unique IISS message identifier.
- e. Invalid messages shall be given a status indicating the type of error and are sent to Log Message. Valid messages shall be given a status code indicating their validity and are sent to Log Message.
- f. MPU file and table access errors during Complete Message Header shall cause a status message to be sent to the Monitor AP.
- g. Complete Message Header shall also generate a status return to be returned to the originator of the invalid message.
- h. Complete Message Header shall check the message category of all valid messages to determine if any special message processing is required. If neither, an "accepted" status message shall be generated to be returned to the originator.
- i. All messages, except status returns, status messages to the monitor AP, and messages requiring special message handling shall be sent to Log Message.

- j. Status returns and status messages to the Monitor AP shall be sent to Route and Send.
- k. Messages requiring special message handling (Category A, B, H, and J messages) are sent to Special Message Handling.

#### 4.2.3.3 Outputs

Outputs from this function are as follows:

| Description<br>-----                                                | Destination<br>-----                      | Range<br>-----                                                                                 |
|---------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------|
| Accepted msgs from on-cluster with no special handling requirements | Log Message Function                      | Accepted Category C-G messages                                                                 |
| Messages from on-cluster with a special requirement                 | Perform Special Message Handling function | Category A, B, H, handling and J messages                                                      |
| Messages rejected by MM                                             | Log Message Function                      | Messages rejected by Complete Message Header                                                   |
| Send Status on Message                                              | Route and Send Message Function           | "Header Error" Status Return<br><br>"Message Accepted" Status Return                           |
| Status Message to Monitor AP                                        | Route and Send Message Function           | "Table Access Error" msg to MONITOR AP<br><br>"MPU Processing Error" message to the Monitor AP |

#### 4.2.4 Perform Special Message Handling Function

The Perform Special Message Handling function is responsible for updating the MPU's tables for guaranteed delivery, message pairing, or the sending APs Child Table for messages that require entries in any of these special message tables.

##### 4.2.4.1 Inputs

Inputs to this function are as follows:

| Description<br>-----                                     | Source<br>-----         | Range<br>-----                                            |
|----------------------------------------------------------|-------------------------|-----------------------------------------------------------|
| Category A Messages<br>from on-cluster                   | Complete Message Header | Guaranteed<br>Delivery<br>messages                        |
| Category B and D<br>Messages from<br>on-cluster          | Complete Message Header | Message<br>requiring a<br>response                        |
| Category H and J<br>Messages from<br>on-cluster          | Complete Message Header | Specific<br>Initiation<br>messages                        |
| Category E Messages<br>having no Destination<br>Instance | Complete Message Header | Message that<br>may require the<br>initiation<br>of an AP |
| Message Pairing Table                                    | Internal table          | N/A                                                       |
| Guaranteed Delivery<br>Table                             | Internal table          | N/A                                                       |
| Child Table                                              | Internal Table          | N/A                                                       |

##### 4.2.4.2 Processing

- a. If the message received is a Category A message, an entry is made to the Guaranteed Delivery Table.
- b. If the message received is a Category B, D or J message, an entry, with a timeout value, is made to

the Message Pairing Table. If the table entry is successfully made, a 'message accepted' status is returned to the sender.

- c. If the message received is a Category H or J message, an entry that indicates a status of 'initiation message sent' is made to the Child Status Table for the sending AP. If the table entry is successfully made, a 'message accepted' status is returned to the sender.
- d. If there is no destination instance and the category indicates that an AP may be initiated (i.e. category B or E) a child table entry will be created with a status of "reserved".
- e. If the attempt to make an entry into any of the tables is unsuccessful, a 'Resource Unavailable' send status is returned to the sender via the Route and Send message function. In addition, a 'Table Access Error' status message is sent to the Monitor AP to inform the IISS operator of the event.
- f. Messages that were not processed because of table access failures are sent to Log Message with a logging code that indicates 'Resource Unavailable'.

#### 4.2.4.3 Outputs

Outputs from this function are as follows:

| Description<br>-----                                         | Destination<br>----- | Range<br>-----                                                                                             |
|--------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------------|
| Processed Category A, B, D, and H messages from on-cluster   | Log Message function | All Category A, B, D, H, and J messages that have been successfully processed in Special Message Handling. |
| Unaccepted Category A, B, D, and H messages from off-cluster | Log Message function | All messages B, (Category A, B, D, H and J)                                                                |

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| <u>Description</u><br>-----                                                      | <u>Destination</u><br>-----      | <u>Range</u><br>-----                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unaccepted Category<br>A, B, D and H Messages<br>from off-cluster<br>(Continued) |                                  | that could not be<br>processed<br>by Special<br>Message Handling<br>due to a<br>Table Access<br>Error.                                                                                                                                                                                   |
| Send Status                                                                      | Route & Send Message<br>function | "Accepted<br>Message"<br>status returns on<br>successfully<br>processed<br>Category B, D, H,<br>and J messages.<br><br>"Resource<br>Unavailable"<br>status returns on<br>all Category A,<br>B, H, and J<br>messages that<br>were not<br>processed because<br>of a Table Access<br>error. |
| Status Message to<br>Monitor AP                                                  | Route & Send Message<br>function | "Table Access<br>Error" status<br>message to the<br>Monitor AP on<br>messages not<br>successfully<br>processed by the<br>Special Message<br>Handling<br>function.                                                                                                                        |

#### 4.2.5 Log Message Function

The Log Message function is responsible for logging messages.

#### 4.2.5.1 Inputs

Inputs to this function are as follows:

| Description<br>-----                  | Source<br>-----                         | Range<br>-----                                                                        |
|---------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------|
| Message Rejected<br>by MM             | Receive & Interpret<br>Message function | Rejected messages<br>from off-cluster<br>due to routing<br>failures                   |
|                                       |                                         | Rejected messages<br>from on-cluster<br>due to unrecog-<br>nized category             |
|                                       | Authorize Message<br>function           | Rejected messages<br>from on-cluster<br>due to an<br>authorization<br>failure         |
|                                       | Complete Message<br>Header function     | Rejected messages<br>from on-cluster<br>due to header<br>errors                       |
| Message Rejected<br>by MM (Continued) | Perform Special<br>Message Handling     | Rejected messages<br>from on-cluster<br>due to special<br>message handling<br>failure |
| Accepted Messages<br>from On-cluster  | Complete Message<br>Header function     | Accepted messages<br>with completed<br>header (all<br>categories)                     |
| Accepted Messages<br>from Off-Cluster | Receive & Interpret<br>Message function | Accepted messages<br>off-cluster (all<br>categories)                                  |
| Log Format                            | Internal Tables                         | N/A                                                                                   |

#### 4.2.5.2 Processing

The processing is described below.

- a. Log Message shall add an entry to the message log for each message received. The log entry will include: the message, an error code for rejected messages, and the host's clock-time stamp at the time of the log.
- b. Entries into a separate error log could be made for all error conditions encountered in the message processing. The format of this error log has not yet been determined but should include an error code, the error source, ID and the host's clock-time stamp. For the initial Test Bed, this will not be a separate log.
- c. Log Message shall check the message category to determine if guaranteed delivery is required. If so, a "logged" status message shall be generated to be returned to the originator.
- d. If an error occurs in logging, Log Message shall generate a status message to be sent to the Monitor AP via Route and Send Message. Error conditions may include file access errors, file space errors and file write errors.
- e. All accepted messages shall be sent to Route and Send Message.

#### 4.2.5.3 Outputs

Outputs from this function are as follows:

| Description<br>----- | Destination<br>-----             | Range<br>-----                                          |
|----------------------|----------------------------------|---------------------------------------------------------|
| Logged Messages      | Route & Send Message<br>function | All accepted and<br>logged messages<br>from off-cluster |



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| Description<br>-----             | Destination<br>-----             | Range<br>-----                                                     |
|----------------------------------|----------------------------------|--------------------------------------------------------------------|
|                                  |                                  | All accepted and<br>logged messages<br>from on-cluster             |
| Send Status                      | Route & Send Message<br>function | Message accept<br>status<br>on Guaranteed<br>Delivery<br>messages  |
| Status Messages to<br>Monitor AP | Route & Send<br>Message function | Status Message<br>to the Monitor AP<br>"Error condition<br>on log" |
| Message Log                      | Internal file                    | N/A                                                                |

#### 4.2.6 Route and Send Message Function

The Route and Send Message function is responsible for forwarding messages to their next destination.

##### 4.2.6.1 Inputs

Inputs to this function are as follows:

| Description<br>-----               | Source<br>-----                                                              | Range<br>-----                                                                             |
|------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Logged Messages                    | Log Message function                                                         | All accepted<br>and logged<br>messages<br>from on-cluster<br>and off-cluster               |
| Send Status and<br>Status Messages | Receive & Interpret<br>Message function<br><br>Authorize Message<br>function | All status re-<br>turns to the<br>Source AP and<br>status messages<br>to the<br>monitor AP |

| Description<br>-----        | Source<br>-----                              | Range<br>----- |
|-----------------------------|----------------------------------------------|----------------|
|                             | Complete Message Header<br>function          |                |
|                             | Perform Special Message<br>Handling function |                |
|                             | Log Message function                         |                |
| Host & APC Status<br>Tables | Internal Tables                              | N/A            |

#### 4.2.6.2 Processing

The processing is described below.

- a. Route and Send Message shall check the destination field of a message and access internal table information to determine routing.
- b. If the destination is for an on-cluster application, the message shall be sent to the Manage Process function of the NTM.
- c. If the message is a system command (Category C and D messages) for the on-cluster NTM, the message shall be sent to the Maintain Cluster Operability function (Handle System Commands, 4.2.12).
- d. If the destination is off-cluster, Route and Send Message shall check the host designation.
- e. If the destination is off-cluster, the status of the destination APC will be checked in the APC Status Table. If the destination APC is unavailable, a status message is sent to the monitor AP and the source to inform them that the destination resources are unavailable. If the message is a guaranteed delivery, it will be queued. Otherwise, the message is lost.
- f. If the destination cluster is on-host, the message shall be sent to the correct off-cluster mailbox (Receive and Interpret Message function of MM).

- g. If the destination is off-host, the message shall be sent to the correct on-host COMM APC mailbox (Receive and Interpret Message function).
- h. If a recoverable error (e.g., mailbox full) is detected on a send, Route and Send Message shall queue the message for later delivery.
- i. If an unrecoverable error (e.g., unrecoverable status returned), Route and Send Message shall generate a status message and attempt to send it to the Monitor AP.
- j. If an unrecoverable error occurs on sending a message to the Monitor's APC, ERRPRO will be called.

#### 4.2.6.3 Outputs

Outputs from the function are as follows:

| Description<br>-----                | Destination<br>-----                                                      | Range<br>-----                               |
|-------------------------------------|---------------------------------------------------------------------------|----------------------------------------------|
| Messages to Off-cluster             | Manage Message: via Off-Cluster MPU mailbox Receive & Interpret function) | All messages with off-cluster destinations   |
| On-cluster AP Messages, Send Status | Manage Process (Interpret Message Category function)                      | All messages with on-cluster AP destinations |
|                                     | Manage Process                                                            | All status returns for on-cluster messages   |
| Status Returns                      | Accept Requests from AP of the Manage Process function                    | All on-cluster status returns                |

| <u>Description</u>         | <u>Destination</u>                                    | <u>Range</u>                                  |
|----------------------------|-------------------------------------------------------|-----------------------------------------------|
| Status Messages<br>Monitor | Manage Message function<br>of the Monitor AP's<br>MPU | All status to<br>messages<br>to monitor<br>AP |

#### 4.2.7 Interpret Message Category Function

The Interpret Message Category function is responsible for receiving a message from the Route and Send Message function and forwarding it to the appropriate Manage Process subfunction.

##### 4.2.7.1 Inputs

Inputs to this function are as follows:

| <u>Description</u>                    | <u>Source</u>                                         | <u>Range</u>                                                                                                   |
|---------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| On-cluster AP Message,<br>Send Status | Route & Send Message<br>function of Manage<br>Message | Shutdown AP<br>request<br>Abnormally<br>terminate<br>AP request<br>Data messages<br>for APs Status<br>response |
| Message Category Table                | Internal tables                                       | N/A                                                                                                            |

##### 4.2.7.2 Processing

The processing is described below.

- a. This function shall accept as input an on-cluster AP message or message for the NTM from Manage Message.
- b. This function shall interpret the message category based on the message category table and route the message to the appropriate function as follows:

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- A message that explicitly requires initiation of an application process (Category H or J) shall be routed to Initiate Application.
- A shutdown AP request or abnormally terminate AP request message shall be routed to Terminate Application Process.
- A Data Message shall be routed to deliver message to Application Process.

#### 4.2.7.3 Outputs

Outputs from this function are as follows:

| Description<br>----- | Destination<br>-----                         | Range<br>-----                                         |
|----------------------|----------------------------------------------|--------------------------------------------------------|
| Interpreted Message  | Initiate Application Process function        | Category A, B, E, H and J messages                     |
|                      | Abnormally Terminate or Shutdown AP function | Shutdown AP request<br>Abnormally Terminate AP request |
|                      | Deliver message to AP function               | Data Message                                           |

#### 4.2.8 Initiate Application Process Function

The Initiate Application Process function is responsible for initiating and establishing a connection with an application process.

##### 4.2.8.1 Inputs

Inputs to this function are as follows:

| Description<br>----- | Source<br>-----   | Range<br>----- |
|----------------------|-------------------|----------------|
| Category A, B, E,    | Interpret Message | Message        |

| Description<br>-----                                               | Source<br>-----                           | Range<br>-----                                                                |
|--------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------|
| H, and J<br>Messages                                               | function                                  | identified<br>as an initia-<br>tion message                                   |
| AP Initiation Service<br>Request                                   | Initiated AP                              | N/A                                                                           |
| Startup Status<br>Messages from the<br>Initiated AP's<br>Interface | AP Interface                              | "I'm Alive"<br>status<br>message<br><br>"Startup<br>failed"<br>status message |
| Initiate & Connect<br>AP Status Response                           | Host Operating System<br>or IPC Primitive | Status return<br>indica-<br>ting status of<br>AP initiate and<br>connect      |
| AP Operating Infor-<br>mation Table                                | Internal Tables                           | N/A                                                                           |
| AP Characteristics<br>Table                                        | Internal Tables                           | N/A                                                                           |
| AP Status Table                                                    | Internal Tables                           | N/A                                                                           |
| I'm Alive Table                                                    | Internal Tables                           | N/A                                                                           |

#### 4.2.8.2 Processing

- a. On an initiation request message, the AP Operating Information Table of the APC is referenced to determine the number of instances of the AP that are currently active and to determine the number of requests that are queued for the AP.
  - a.1 If there are no instances of the AP currently active, the MPU shall initiate the AP.

- a.2 If there are one or more instances of the AP currently active, the MPU shall check the AP Characteristic Record to determine if the requested AP is a queue server and determine the maximum number of running instances of this AP allowed.
  - a.2.1 If the AP is a queue server (number of parents per instance is greater than one), the MPU shall check the AP Characteristic Table to determine the maximum number of connections allowed for this AP against the number of current connections indicated in the AP Status Table.
    - a.2.1.1 If the number of current connections is less than the maximum number allowed, the message is sent to the AP's mailbox and the number of AP connections is updated in the AP Status table.
    - a.2.1.2 If the number of current connections is equal to the maximum allowed, the AP Characteristic Record is checked and the conditions are handled as in a.2.2 and a.2.3.
  - a.2.2 If the number of active instances is less than the number allowed, the MPU shall initiate the AP.
  - a.2.3 If the number of active instances is equal to the maximum number allowed, the AP's characteristic record is checked to determine the allowed number of queued requests for the AP.
    - a.2.3.1 If the maximum queue size is greater than the current queue size, the message is queued for the

AP and the AP Operating Information Table is updated to indicate an addition to the queue for the AP.

a.2.3.2 If the maximum queue size equals the current size, a "Resource Unavailable" status message is formatted and sent to Manage Message for routing to the MPU where the initiation request was made.

b. If initiation of an AP is indicated, Initiate AP requests the host Operating System to initiate the AP. The MPU supplies a process name for the AP in the initiation request.

b.1 If a successful initiation is indicated by the Operating System Response, the following procedure is followed.

b.1.1 The AP Status Table is updated with a new record for this new instance of the AP. The status is indicated as initiated.

b.1.2 An entry into the I'm Alive Table is made to indicate that the MPU is awaiting a message from the initiated AP to indicate that it successfully started execution.

b.1.3 If the data portion of the initiation message is non-blank (data-length = 0), the data for the AP shall be queued to be delivered when the AP's "I'm Alive" message is received.

b.1.4 The AP Operating Information Table is updated to indicate the current number of instances active.



- b.2 If a non-successful initiation is indicated in the Operating System Response, the MPU will send an "Initiation Failure" message to the MPU where the initiation request originated. A status message will also be sent to the Monitor AP to indicate the initiation failure event.
  - b.3 On receipt of an "I'm Alive" message from the initiated AP, the MPU changes the AP's process status state entry from "initiated" to "running", signals the Deliver Message function to send the IISS System State Status, and any AP data that was carried in the initiation message to the initiated AP.
  - b.4 If instead of an "I'm alive" message, the MPU receives an "Initiation failure" message from the AP Interface, it updates the APC tables to indicate the failure event and sends the "Initiation failure" messages described above in b.2.
- c. when an IISS AP is initiated, it must call one of the NTM's Initiation Service Routines. New APs will call "INITAL" [8], the NTM Service module described below.
- c.1 "INITAL" provides the mailbox connections of the AP to the NTM that will enable the AP to send and receive messages from other IISS APs.
    - c.1.1 "INITAL" creates the AP's low priority and ACK mailboxes.
    - c.1.2 "INITAL" uses the IPC Primitives [9], that in turn use operating system calls to create the required AP input mailboxes. The AP's MPU-given process name is used to form the AP's mailbox names; the process name is concatenated with A for an AP's ACK mailbox, and with C for the AP's normal-priority mailbox. "INITAL" determines the AP's process name by an operating system call on the VAX

and from the initiation parameter list on the Honeywell and the IBM.

- c.2 If the mailbox connection requests are successful, "INITAL" establishes an IISS exception handler for the AP. (This Exception Handler will trap all Operating Systems and Machine Exceptions for the AP, formulate a status message for the MPU of the AP's parent (spawn), and then terminate the AP.)
- c.3 If the initiation procedure, INITAL, is still successful at this point, an "I'm Alive" message that contains the AP's process name is sent to one of its MPU's mailboxes.
  - c.3.1 If a non-recoverable failure status is returned on this IPC SEND to the MPU's mailbox, "INITAL" calls ERRPRO, and returns an INITAL-NOT-SUCCESSFUL code to the calling AP.
  - c.3.2 If a "mailbox-full" status is returned on this IPC SEND, a timer is set by "INITAL" and on the timers completion, the SEND is repeated. This step is repeated until the call is successful or until the number of times tried surpasses the IISS set limit.
- c.4 If the "I'm Alive" message is successfully sent, "INITAL" reads (with a wait) the AP's input mailbox for a message from the MPU that contains the IISS System State (IISS Startup, IISS Recovery, or IISS Normal Operations) for special AP startup state information, such as, first run since IISS start. The system state message also carries information about the AP, such as the number of mailboxes it supports, and the original source AP. A timer is also set when the read is issued.

- c.4.1 If a mailbox event occurs before the timer and the received message contains the IISS system-state information, "INITAL" checks the number of mailboxes the AP will support (None, if the AP receives no messages; one, if the AP can receive no high-priority shutdown messages from the NTM, and two, if the AP can receive high-priority messages.) If the AP supports no mailboxes, the low priority and ACK are deleted. If the AP supports two mailboxes, "INITAL" will create the AP's high priority mailbox. Upon successful handling of the mailboxes returns to the AP with the SYSTEM-STATE and a successful STARTUP-STATUS.
- c.4.2 If the message received is not the system-state message, "INITAL" returns to the AP with an INITIAL-NOT-SUCCESSFUL status.
- c.4.3 If a timer event occurs before a mailbox event, "INITAL" returns to the AP with an INITIAL-NOT-SUCCESSFUL status.

d. Figure 4-18 depicts the roles of the AP, the AP Interface and the MPU in the successful initiation of an AP.

AP  
--

AP Interface  
-----

MPU  
---

1. OS call to initiate AP
2. Successful return from OS call - A C table updates to indicate the initiation of AP
3. Executing AP calls "INITAL" to initiate its connection to the NTM
4. "INITAL" creates the AP's Low Priority and ACK mailboxes
5. "INITAL" establishes the IISS exception handler for the AP
6. "INITAL" sends an "I'm Alive" message to the MPU
7. The MPU receives the "I'm Alive" message and updates its AP state tables accordingly.
8. The MPU sends the AP the IISS System State information and any AP initiation data that was carried in the initiation message

Figure 4-18. AP Initiation

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9. INITIAL receives the  
system state message  
from the MPU establishes  
the correct number of  
mailboxes and return  
to the AP
10. The AP begins its  
operating code  
and issues a CALL  
"RCV" if it expects  
initiation data

Figure 4-18. AP Initiation (Continued)

#### 4.2.8.3 Outputs

| Description<br>-----                                                          | Destination<br>-----                             | Range<br>-----                                                       |
|-------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------|
| Initiate AP Request                                                           | Host Operating System                            | N/A                                                                  |
| Create AP Mailbox Request                                                     | Host Operating System<br>(via IPC Primitive)     | N/A                                                                  |
| Initiation Status Messages from AP Interface                                  | Manage Message Function<br>(MPU's input mailbox) | "I'm Alive"<br>"Initiation Failed"<br>msgs                           |
| Initiation Status Msg Arrival Notification                                    | Deliver Message to AP                            | "I'm Alive"                                                          |
| Initiation Status Messages to the MONITOR AP and source MPU from the AP's MPU | Manage Message Function                          | "Initiation Failure" messages                                        |
| AP Message Queue Update                                                       | Internal Table                                   | Initiation Data for AP                                               |
| APC "I'm Alive" Table Entry                                                   | Internal Table                                   | "I'm Alive" Waiting Entry<br><br>"I'm Alive" Arrived - Cancels Entry |

#### 4.2.9 Deliver Messages to Application Process

The Deliver message to Application Process function is responsible for delivering messages to the AP. This function includes the MPU's writing of the message to the AP's mailbox, and the AP Interface's reading of the message from the AP's mailbox, its stripping of the NTM message header, and its delivery of the message data to the destination AP.

##### 4.2.9.1 Inputs

Inputs to the function are as follows.

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| <u>Description</u><br>-----                 | <u>Source</u><br>-----          | <u>Range</u><br>-----                                                            |
|---------------------------------------------|---------------------------------|----------------------------------------------------------------------------------|
| Messages for<br>On-Cluster APs              | Interpret Message<br>Category   | All messages<br>for on-cluster<br>APs                                            |
| Operating System<br>Response (IPC Response) | Host Operating<br>System        | Responses to<br>"SNDMSG",<br>"RCVMSG",<br>"SETTIM",<br>"WAIT", IPC<br>Primitives |
| NTM Service:<br>Call "RCV"<br>Arguments     | Source AP Requesting<br>Message | N/A                                                                              |

#### 4.2.9.2 Processing

- a. On receipt of a message for an on-cluster AP that has already been initiated by the message source, the Deliver Message to AP function sends the message to the correct mailbox of the AP.
  - a.1 If an unrecoverable error status is returned on the 'SNDMSG' call, a status message is sent to the monitor AP and to the MPU of the message source signifying the 'MAILBOX WRITE ERROR.'
  - a.2 If the AP's mailbox is full, the message is added to the on-cluster AP's message queue.
- b. On notification by the Initiate Message function of an "I'm Alive" message from an initiated on-cluster AP, Deliver Message formulates and sends to the AP, a System-State Message that contains IISS State Information, and, if required, a message containing the AP's initiation data. On a send failure, the actions of a.1 or a.2 are taken.
- c. In response to an AP's RCV Service Request, the AP Interface first searches the AP's message buffer for the requested messages. If it is found then

Step c.1 is performed. If it is not found the AP Interface reads the AP's mailbox(es). If a wait is implied, the AP Interface waits for a message and when one is received, checks whether the message header satisfies the AP's request. If no wait is signaled, a "GETMSG" IPC call is made after the "RCVMSG" call.

- c.1 If a message is in the buffer or in the mailbox and is of the type requested, the AP Interface removes the WTH header and delivers the data portion and required arguments to the AP.
- c.2. If the message is not of the type requested, the AP Interface buffers the message for a later AP request and either returns to the AP with a non-message status if the request signalled "no-wait," or rereads the AP's mailbox(es) for another message if the AP's request implied a "wait."
- d. If an unrecoverable error is detected on the "RCVMSG" or "GETMSG" IPC calls, the AP Interface generates and sends a status message to the Monitor AP, and returns a failure status to the AP.
- e. Figure 4-19 depicts the roles of the AP, the AP Interface and the MPU on a "RCV" (with wait) request from an AP. Note that events 1a and 1b occur asynchronously.



AP

--

- 1a. The AP issues an  
NTM service  
request,  
CALL "RCV" with a  
the wait indicated

AP Interface

-----

MPU

---

- 1b. As the MPU  
messages for  
the AP, it  
delivers the  
message to the  
AP's mailboxes  
If the AP's  
mailbox(es) is  
full, the MPU  
queues the  
message for  
later delivery

2. The AP interfaces  
responds to the AP's  
"RCV" request, by
- First searching the  
AP's buffer for a  
message of the type  
requested
  - If the request  
message is not found,  
the AP Interface reads  
the AP's mailbox  
indicated by the "RCV"  
request until the mail-  
box is either empty or  
a message of the type  
requested is found.  
(The sequence of IPC  
calls is RCVMSG, WAIT;  
then on a mailbox event,  
GETMSG.)
3. On finding a message of  
the type requested, the  
AP Interface strips the  
NTM header from the  
message and returns the AP's  
data and required "RCV"  
return arguments to the AP.
4. The AP receives back  
control, its data,  
and the "RCV" call  
arguments

Figure 4-19. A "RCV" (with wait) AP Scenario

#### 4.2.9.2 Outputs

| <u>Description</u><br>-----                                                          | <u>Destination</u><br>----- | <u>Range</u><br>-----                                                                                                              |
|--------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| OS Process Control<br>Requests (via IPC<br>Primitives)                               | Host Operating System       | IPC Primitives:<br>"SNDMSG"<br>"RCVMSG"<br>"GETMSG"<br>"WAIT"<br>"SETTIM"                                                          |
| Service Calls Return<br>to the Requesting APs<br>(Messages to the on-<br>cluster AP) | AP                          | NTM service<br>calls:<br>Call "RCV"<br>Call "CHKMSG"<br>returns                                                                    |
| APC Message Queue<br>Updates                                                         | Internal Tables             | Messages for APs<br>whose mailboxes<br>were full on<br>a "SNDMSG"<br>request -<br>delivery to be<br>retried at queue<br>check time |
| Status Message<br>to Monitor AP and<br>and Source MPUs                               | Manage Message              | Error messages:<br>Unrecoverable<br>errors on IPC<br>Pimitives                                                                     |

#### 4.2.10 Accept Requests from Application Process

The Accept Requests from Application Process function is responsible for accepting and servicing AP Service Requests. The Service Requests that an AP may use are described in the IISS Programmers Guide [8].

##### 4.2.10.1 Inputs

Inputs to this function are as follows.

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| Description<br>-----                 | Source<br>-----                                             | Range<br>-----                                                        |
|--------------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------|
| NTM Service Request<br>Arguments [8] | AP                                                          | [8]                                                                   |
| OS Process Control<br>Response       | Host Operating System<br>(possibly via an IPC<br>Primitive) | Reponses on<br>IPC Primitives                                         |
| Send Status Responses                | Manage Message                                              | "Message<br>Accept" or<br>"Message<br>Reject"<br>responses from<br>MM |
| APC Tables                           | Internal Tables                                             | AP Status<br>Table<br>AP<br>Characteristic<br>Table                   |

#### 4.2.10.2 Processing

On an AP's NTM Service request ([8] and Figure 4-20) the called AP Interface routine begins execution, accepts the arguments of the Service call and begins the servicing of the requests. The connection and communication requests with the resulting AP Interfaces actions are described in Figure 4-19. For all of the Services, an unrecoverable error results in a "failure" status return to the AP and a message to the MONITOR AP that indicates the error condition. ERRPRO is called if the status message cannot be delivered to the MPU's mailbox(es).

The NTM Request Services can obtain status information from APC tables (WHATAC, PRSTAT, GDSTAT), cause request messages to be sent for IISS status (APSTAT, HSTATS, WTHST, ACSTAT, GETUSR) and cause messages to be sent to effect the AP's request (SIGABT, WKONCA).

Services which are implemented in Release 2.0 are indicated by an asterisk in Figure 4-20 (\*).

**NTM AP Interface  
Services**  
-----

**AP Interfaces Processing**  
-----

**INITAL\***

- Maps to the APC tables
- Determines the AP's NTM given process name
- Creates the AP's required input mailboxes using the AP's process name as the mailbox name
- Establishes the AP's message buffer area
- Establishes the IISS Exception Handler for the AP
- Sends an "I'm Alive" message to the local MPU
- Waits for the "System-State" Message from the MPU
- On receiving the System-State message, it completes mailbox processing and returns control, the System State, and the Startup Status to the AP

**TRMNAT\***

- Sends an "I'm Dying" message to the local MPU
- Disconnect the AP's input mailboxes
- Ends the execution of the AP

**ENDRCY**

- Sends a "Recovery Complete" message to the Monitor AP
- Returns control to the AP

**NSEND\***

- Accepts the data and calling arguments from the AP
- Formulates NTM message(s) that includes the correct NTM header and the AP's data. The data may be packetized into several NTM messages if it is longer than the maximum NTM message data length. The packetizing of continuation messages is transparent to the AP.
- Sends the message, using the IPC primitive, "SNDMSG", to the correct MPU mailbox. If the MPU's mailbox is full, it resends the message until the send is successful.

Figure 4-20. NTM Service Call AP Interface Processing

- If NTM header processing is required, it waits for the return status on message acceptance from Manage Message.
  - On receipt of the message send status or if no header processing is required, returns control to the AP with the correct status returns.
- GDSEND\***
- Same as NSEND, except that
  - GDSEND causes the resulting message to be one of Category A
  - On acceptance, returns control and the message serial number to the AP so that a future status inquiry on the GD message may be made
- ISEND\***
- Same as NSEND, except that
  - ISEND causes the resulting message to be a Category H or J message
- QSEND\***
- Same as NSEND, except that
  - QSEND is only used by Queue-Server APs
  - QSEND sends the "reply" message to exactly the last instance of the Destination from which we had received from last. If we have not received from our destination AP, we cannot send this reply message.

Figure 4-20. NTM Service Call AP Interface Processing  
(Continued)

**NTM AP Interface  
Services**  
-----

**AP Interfaces Processing**  
-----

**CHKMSG\***

- Checks the AP's buffer for a message of the requested type
- If not found, reads the AP's input mailbox(es) until empty or until the correct message type is found
- Returns the appropriate status to the AP either "message found" or "message not found"

**SETDLY**

- Checks the validity of the call's message delay arguments
- If valid, saves the arguments for the header for the next "NSEND", "GDSEND", or "ISEND" call's message and returns to the AP
- If not valid, returns to the AP with a no-accept status

**GDACK\***

- Accepts the input arguments from the AP
- Formulates an NTM message of type GDACK for the MPU of the originating GD message
- Delivers the message to the local MPU's mailbox
- Returns control to the AP

**MSGACK**

- Same as GDACK, except that the message destination is the AP that sent the message requiring the ACK.

**RCV\***

- Accepts the input arguments of the RCV call
- Checks buffer and AP's mailbox for the message requested. (See [8] for the AP request options.)

Figure 4-20. NTM Service Call AP Interface Processing  
(Continued)

AD-A182 056

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS) VOLUME 6  
NETWORK TRANSACTION. (U) GENERAL ELECTRIC CO  
SCHENECTADY NY PRODUCTION RESOURCES CONSU.

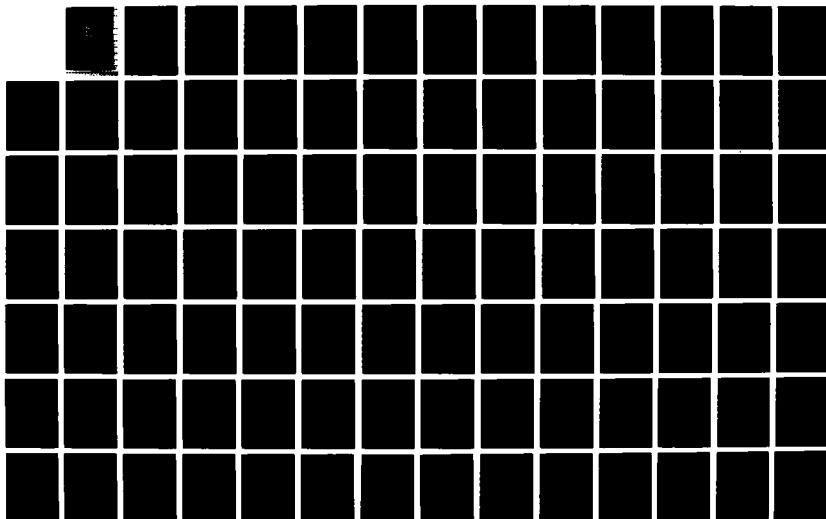
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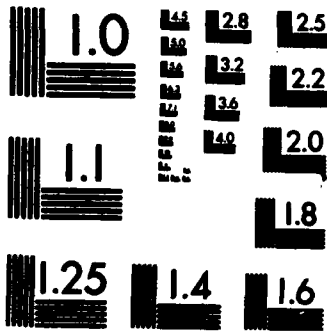
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MICROCOPY RESOLUTION TEST CHART  
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**NTM AP Interface  
Services**  
-----

**AP Interface Processing**  
-----

**RCV (Continued)**

- If found, the AP Interface strips the NTM header from the AP's message and returns that data and return arguments to the AP.
- If the requested message is not found and a wait was requested by the AP the AP Interface waits until a mailbox event is signaled. It then performs the previous step.
- If the requested message is not found and no wait was signaled, the API returns control to the AP with a "No Message" status

**TSTMOD\*  
(Partially  
implemented)**

- Checks the TSTMOD argument
- If it signals 'ON', all asynchronous error messages sent after will be passed to the AP.
- If it signals 'OFF', all messages sent after will be discarded
- The default TSTMOD setting is "Off" or "0"

**SIGERR\***

- Formats the Signal Error (SE) message using the given AP Name and AP Error Code, severity level, and error description.
- Sends the SE message to the original source AP (typically the UI) and to the monitor AP.

**APSTAT**

- Formats the AP Status Request (SR) message using the given AP Name.
- Forwards the SR message to the NTM for processing (if AP is local - Read APS table, if AP is off-cluster - forward message to appropriate MPU).
- Receives the AP Status Return (IS) from the NTM
- Passes the AP Status data to the requesting AP.

Figure 4-20. NTM Service Call AP Interface Processing  
(Continued)

**NTM AP Interface  
Services**

-----

**AP Interface Processing**

-----

**HSTATS**

- Formats the Host Status Request (HR) message using the given Host Name.
- Forwards the message to the local MPU for processing (read Host Status Table).
- Receives the Host Status Return (HO) message from the Local MPU.
- Passes the Host Status Data to the requesting AP.

**WHTHST**

- Formats the Host Name Request (HN) message using either the given AP Name or the name of the AP to which the service is currently bound.
- Forwards the message to the NTM for processing (Read API and APC Tables).
- Receives the Host Name Return (NH) or processing error message from the Local MPU.
- Passes the Host Name to the requesting AP.

**WHATAC**

- Formats the APC Name Request (AN) message using either the given AP Name or the name of the AP to which the service is currently bound.
- Forwards the message to the Local MPU for processing (read AP Information Table).
- Receives the APC Name Return (NA) message from the local MPU.
- Passes the APC Name to the requesting AP.

**WKONCA**

- Formats the APC Availability Request (AV) message using the given APC Name.
- Forwards the message to the local MPU for processing.
- Receives the APC Available Return (VR) message from the MPU.
- Passes the relevant return status to the requesting AP.

Figure 4-20.

NTM Service Call AP Interface Processing  
(Continued)

**NTM AP Interface  
Services**

**AP Interface Processing**

**ACSTAT**

- Formats the APC Status Request (PS) using the given APC Name.
- Forwards the message to the Local MPU for processing (read APC Status Table).
- Receives the APC Status Return (PR) message from the MPU.
- Passes the APC status data to the requesting AP.

**SIGABT  
(Partially  
implemented)**

- Formats the Abort AP (AB) message using the given AP Name and logical channel.
- Forwards the message to the Local MPU for processing (process message and send to given AP).

Figure 4-20. NTM Service Call AP Interface Processing  
(Continued)

**NTM AP Interface  
Services**  
-----

**AP Interface Processing**  
-----

- |                |                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <ul style="list-style-type: none"><li>● Returns the sending status of the message to the requesting AP. Note: the API does not return the status of the Abort procedures in this call.</li></ul>                                                                                                                                                                                                                  |
| <b>PRSTAT</b>  | <ul style="list-style-type: none"><li>● Formats the Paired Message Status Request (MS) message using the given message destination and logical channel.</li><li>● Forwards the message to the Local MPU for processing (Read Message Pair Table).</li><li>● Receives the Paired Message Status Return (MR) message from the Local MPU.</li><li>● Passes the Paired Message Status to the requesting AP.</li></ul> |
| <b>GDSTAT</b>  | <ul style="list-style-type: none"><li>● Formats the GD Status Request (GS) message using the given Message Serial Number.</li><li>● Forwards the message to the local MPU for processing (Read GD Table).</li><li>● Receives the GD Status Return (GR) from the Local MPU</li><li>● Passes the GD message status to the requesting AP.</li></ul>                                                                  |
| <b>GETUSR*</b> | <ul style="list-style-type: none"><li>● Locates the original source AP Name.</li><li>● If the original source AP is a user interface; accesses the Logon Table to determine the user logon data.</li><li>● Returns the original source data to the requesting AP.</li></ul>                                                                                                                                       |

Figure 4-20. NTM Service Call AP Interface Processing  
(Continued)

\* Indicates services implemented by Release 2.0.

#### 4.2.10.3 Outputs

| Description<br>-----            | Destination<br>-----            | Range<br>-----                                                           |
|---------------------------------|---------------------------------|--------------------------------------------------------------------------|
| Messages to be<br>Routed        | Manage Message                  | All message<br>types                                                     |
| OS Requests<br>(IPC Primitives) | Host Operating<br>System        | IPC Primitive:<br>"SNDMSG"<br>"GETMSG"<br>"RCVMSG"<br>"WAIT"<br>"SETTIM" |
| AP Initiation<br>Requests       | Initiate Application<br>Process | NTM Service<br>"INITIAL"                                                 |
| AP Termination                  | Terminate Application           | NTM Service<br>"TRMNAT"                                                  |

#### 4.2.11 Terminate Application Process Function

The Terminate Application Process function is responsible for terminating or signaling shutdown to an application process.

##### 4.2.11.1 Inputs

Inputs to this function are as follows:

| Description<br>-----                    | Source<br>-----               | Range<br>-----                                                                      |
|-----------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|
| AP Termination<br>from "TRMNAT" Request | Accept<br>AP                  | Requests                                                                            |
| Messages for<br>On-Cluster              | Interpret Message<br>Category | "I'm Dying"<br>message<br>from AP<br>"Shutdown AP"<br>message "Abort<br>AP" message |
| Terminate AP<br>Status Response         | Host Operating System         | Status msg<br>indicating<br>status of Abort                                         |

| Description<br>----- | Source<br>----- | Range<br>-----                                                    |
|----------------------|-----------------|-------------------------------------------------------------------|
|                      |                 | AP request                                                        |
| APC Tables           | Internal Tables | AP Status Table<br>AP Child Table<br>AP Characteris-<br>tic Table |

#### 4.2.11.2 Processing

The processing is described below.

##### 4.2.11.2.1 Abnormally Terminate or Shutdown AP

Upon receipt of an "abort AP" or "shutdown AP" request this function shall (Note: the abnormal abort logic is not implemented in Release 2.0)

- a. Check the AP Status Table to determine if the requested AP has an entry.
  - a.1 If it has an entry but the AP has already terminated, the NTM send an "AP Terminated" message to the NTM where the request originated.
  - a.2 If there is no entry in the Status Table, an 'Awaiting INIT' entry is made in the Process Status Table. This is made because the abort message (high priority) may get to the NTM before the initiation message (low priority). When the expected initiation message is later received, the entry is removed from the table and an "abort ack" is sent to the NTM where the abort request was made.
- b. If the AP has a status entry and is running, then the NTM checks the AP Characteristic Record to determine whether the AP expects an "abort" message that signals "soft-abort" to APs that perform special processing on aborts, or runs to completion, or expects an NTM abort on this event.
  - b.1 If a "soft-abort" message is expected,

the MPU formats a message of this type, and delivers the message to the AP's high priority mailbox.

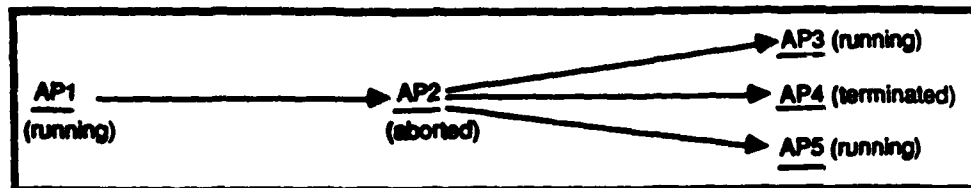
- b.2 If an NTM abort is required, the MPU uses a host operating system service to terminate the AP.
- b.3 On termination, the AP's process status is updated to "aborted". A "child status" message is sent to the parent AP. If the abort request was from the operator, an "ACK" is also sent to the MONITOR AP for the Operator's Console. The child table of the AP is checked for alive APs that were spawned by the aborted AP. For each alive child AP, an "Abort AP" message is sent to the MPU of the child AP. The abort protocol is described as scenarios in Figure 4-21.
- b.4 On the receipt of a "child status AP aborted" message, the receiving NTM;
  - b.4.1 Checks the status of the parent AP and, if running, checks the parent's AP Characteristic Record to determine whether to
    - send an "aborted child" status message to the AP, or
    - abort the parent AP, or
    - let the parent AP continue and not send it a status message.
  - b.4.2 In addition, the NTM of the parent AP updates the child table of the parent AP to indicate the new status of the aborted AP.
  - b.4.3 On receipt of a child status message that indicates the completion of one branch of the APs child tree, the NTM checks to see if all children of a terminated AP are also terminated. The NTM of the AP sends a cleanup message to the NTM of each AP in its child tree

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and then removes the AP's entry from the Process Status Table and its Child Table entries.

- b.5 On the receipt of a "cleanup" message, the receiving NTM, removes the designated AP's entries in the Application Process Status Table and associated child table.
- b.6 Where the IISS state is "IISS shutdown," no acknowledgement or child abort processing is performed on the Abort AP or Shutdown AP message. It is assumed that each APC will do its own AP shutdown and cleanup.
- b.7 If the IISS state is "Host Shutdown" or "APC Shutdown", on the Abort AP or Shutdown AP message, acks and child abort notifications are sent, but shutdown proceeds without waiting for any child status or cleanup messages.
- b.8 No messages are sent to APC's or hosts in shutdown state.
- b.9 If the AP is of the type "Run to Completion," it is allowed to complete if the IISS is not in APC, HOST, or IISS Shutdown mode.





1. AP2 is aborted by its MPU
2. AP1's MPU sends a child status (abortack) to AP2's parent with the status of AP2's child tree (children running)
3. NTM sends ABORT messages to AP3's and AP5's MPUs
4. AP1's NTM updates child table to "child aborted with children active," on receiving the child status AP2
- 4'. AP3 and AP1's AP5 are indicate aborted
- 5'. Child status messages are sent to message AP2's MPU
5. AP1's characteristic record is checked to determine what action should be taken on the child status message from AP2
6. AP2's NTM receives both child status msgs from AP2 & AP3 that indicates their terminations, updates its tables, sends cleanup messages to AP2 & AP3's NTMs, and sends a "children-terminated" message to AP1's MPU
7. If AP1 is to be aborted: the NTM aborts AP1 and sees that its child tree in the process of terminating, so waits for child status messages that indicate completion of the tree
- 7'. AP2 & AP3's NTMS remove the process status and is child table entries for AP2 & AP3

Figure 4-21. NTM Abort AP Protocol

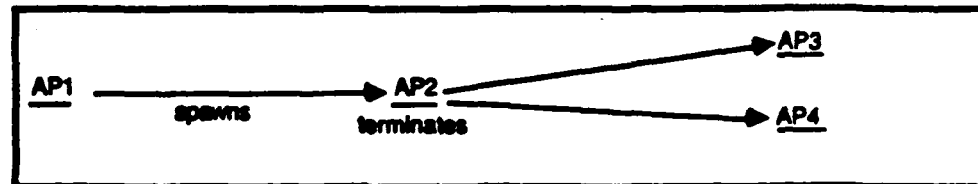
8. On receiving the "children terminated" message from AP2's NTH, AP1's NTH removes AP1's table entries and sends a cleanup message to AP2's NTH
9. AP2's NTH receives the cleanup message from AP1's NTH and removes its table entries for AP2

Figure 4-21. NTH Abort AP Protocol (Continued)

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#### 4.2.11.2.2 Normal Termination

Upon receipt of an "I'm Dying" message from an AP, the NTM sends a child status message to the NTM of the parent (or spawner) of the terminated AP. Child table processing and cleanup continues as indicated in Figure 4-22.



1. AP2 terminates - sends "I'm Dying" message to its NTM
2. NTM of AP2 sends child status message to AP1 indicating AP2 normal termination with children active
3. NTM of AP1 receives child status message from AP2's NTM. Checks to see if AP1 gets informed of event and handles this appropriately.
4. NTM of AP1 updates AP1's child status table
5. AP3 and AP4 terminate, send status messages to the NTM of AP2
6. NTM of AP2 receives child termination messages, sees that child tree is complete removes its entries for AP2 and sends status msg to AP1's NTM.

Figure 4-22. NTM - Normal AP Termination Protocol

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7. NTM of AP1 receives the status message, and on termination of AP1 and completion of all AP1's children, AP1's NTM sends a cleanup message to NTM
8. NTM of AP2 sends a cleanup message to AP3 and AP4's NTM's
9. AP3 and AP4's NTM remove all AP3 and AP4 table AP2's entries
10. NTM of AP2 receives & processes its cleanup message

Figure 4-22. NTM - Normal AP Termination Protocol (Continued)

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#### 4.2.11.3 Outputs

| <u>Description</u>          | <u>Destination</u>    | <u>Range</u>                                                                                                                                                                 |
|-----------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OS Requests to Abort<br>APs | Host Operating System | Operating System<br>dependent<br>process termina-<br>tion requests                                                                                                           |
| Messages to be Routed       | Manage Message        | "I'm Dying"<br>message from<br>terminating AP<br><br>Child status<br>messages to<br>NTMs of<br>terminating<br>AP's parent<br><br>Cleanup messages<br>to NTM of child<br>APs. |
| APC Table Updates           | Internal Tables       | AP Process Table<br>Child Table                                                                                                                                              |

#### 4.2.12 Handle System Commands

The Handle System Command function is responsible for processing commands from the Monitor AP for the APC.

##### 4.2.12.1 Inputs

Inputs to this function are as follows:

| <u>Description</u>                                 | <u>Source</u>  | <u>Range</u>                                                                      |
|----------------------------------------------------|----------------|-----------------------------------------------------------------------------------|
| Messages for Maintain<br>(APC) Operability<br>(MO) | Manage Message | "Shutdown APC"<br>"Shutdown AP"<br>"Display Active<br>APs" "Recover<br>APC" (TBD) |

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| <u>Description</u>    | <u>Source</u>         | <u>Range</u>                                                                             |
|-----------------------|-----------------------|------------------------------------------------------------------------------------------|
| OS Responses          | Host Operating System | APC Startup Responses to "Get APC name request" Response to "Map to Host Tables Request" |
| Host Tables           | Internal Tables       | Message Definition APC, Host Status Tables                                               |
| APC Queues and Tables | Internal Tables       | All APC Tables                                                                           |

#### 4.2.12.2 Processing

The Handle System Command function processes the IISS System Commands from the Monitor AP according to the following procedures.

#### System Command

#### NTM Processing

##### START APC

1. Gets the MPU's process name.
2. The MPU, on startup, maps to the host tables that are maintained by the Monitor AP.
3. Creates the MPU's high and low priority input mailboxes using is process name concatenated with "H" and "C" for the mailbox names.
4. If steps 1-3 are successful, the MPU sends a "Table Configuration Status Request" to the Monitor AP. If steps 1-3 have failed, it sends a startup fail-status message to the Monitor AP. If it cannot send a message to the Monitor AP, it calls ERRPRO and terminates.

5. If processing is still successful, the MPU waits for a "Table Status" message from the Monitor AP.

6. The remaining startup protocol is described in Figure 4-23

**Shutdown AP**

See 4.2.11.2.1

**Shutdown APC**

1. Sets APC Shutdown flag.

2. Does abort/shutdown processing for each AP in AP Status Table (4.2.11.2.1)

3. Processing continues until the mailboxes are empty and all AP's are dead.

4. Saves queues

5. Saves initialization data.

6. Deletes mailboxes.

7. Sends "APC Terminating" message to the Monitor AP.

8. Terminates



MPU (after being initiated)

Monitor AP

1. Sends "Table Status Request" message and waits for return message.
  - 2a. On receipt of message, and if tables are OK sends "Tables OK" message to MPU
  - 2b. On receipt of message and tables not OK, sends "Tables Not OK" message to MPU
- 3a. On receipt of "Tables OK" message, reads local files to build tables.
  - If table read is successful, sends "APC Alive" message to Monitor
  - If table read fails, sends "Table Access Failure" message to monitor
  - If return message times out, the APC will terminate.
- 3b. On receipt of "Tables NOT" message, requests CDM data and sends either success or failure message to the Monitor AP on completion
  - 4a. On "APC Alive" message, updates APC status to running, and sends 'Host Active' message to the APC
  - 4b. On "Table Access Failure" message, monitor updates APC status to "down" and notifies operator of condition.
- 5a. On receipt of the 'Host Active' message from the Monitor AP, it sets its status from 'startup' to 'running'. Normal processing can now begin.
- 5b. If the return message times out, the APC will terminate.

Figure 4-23. APC Startup Protocol

System Command

Display Active APs

NTM Processing

1. Creates a message with information about each active AP on its AP Cluster
2. Delivers the message to Monitor MPUs mailbox

4.2.12.3 Outputs

Description

Destination

Range

Response Messages  
to Monitor AP

Manage Messages

Messages:  
"Table Status  
Request"  
"APC termina-  
ting"  
"APC Alive"  
"Active APs"  
"Error Condi-  
tions"  
"Table  
Requests"

APC Tables & Queue  
Updates

Internal Table

All APC Tables

Queue Requests

Handle APC Message  
Queues

"Initiate"; Re-  
cover (TBD),  
Save Queues

4.2.13 Handle APC Message Queues

The Handle APC Message Queues function is responsible for maintaining the APC message queues.

4.2.13.1 Inputs

Inputs to this function are as follows.

| <u>Description</u>     | <u>Source</u>                          | <u>Range</u>                             |
|------------------------|----------------------------------------|------------------------------------------|
| Queue Requests         | Handle System Command Function         | Initiate, Recover (TBD), Save Queues     |
| OS Responses           | Host Operating System (IPC Primitives) | Time out Event Responses on "SNDMSG" IPC |
| Host Tables            | Internal Tables                        | APC Status Table, Host Status Table      |
| APC Tables             | Internal Tables                        | All APC Tables & Queues                  |
| Message Category Table | Internal Tables                        | A-J                                      |

#### 4.2.13.2 Processing

There are two types of message queues within the IISS; off-cluster and on-cluster. Each queue is used to hold messages that cannot be sent due to a destination mailbox full condition. Guaranteed Delivery messages are the only messages queued if the destination is otherwise unavailable.

Both types of queues operate on a first-in-first-out basis (FIFO). Their entries are kept in index-sequential order with the local APC name as an integral part of the primary key. Unique processing for each queue type is described below.

1. Off-Cluster Queue (APCQUE.DAT): When the MPU has a message for another APC, it will check the AP Cluster Status table to determine the status of the destination APC. If the destination APC is not available, a status message is sent to the message source AP and to the Monitor AP. If the message is Guaranteed Delivery, it will be queued in the off-cluster queue. Otherwise, the message is lost.

If the destination APC is active, the MPU will attempt to place the message in the destination's mailbox. If the mailbox is full the message is queued. On the MPU's timer

processing, the queue is checked for extent messages. If any are found, the send will again be attempted until the queue is empty or the mailbox is full.

2. **On-Cluster Queue (APQUE.DAT):** When a message has been accepted for delivery to an on-cluster AP, the queue is checked for extent messages to the destination that have yet to be delivered. Any messages already in queue will be delivered first to ensure serial processing. Messages will be placed in the AP's mailbox until all messages are delivered or the AP's mailbox is full. On a mailbox full or AP's initiating condition the messages will be queued. The on-cluster queue is periodically checked as part of the MPU's timer processing.

#### 4.2.13.3 Outputs

| <u>Description</u>             | <u>Destination</u>         | <u>Range</u>                                                         |
|--------------------------------|----------------------------|----------------------------------------------------------------------|
| Updated Queues                 | Internal Tables<br>message | MM & MP<br>Queues                                                    |
| Messages to On-<br>cluster APs | Deliver Message<br>to AP   | All message<br>categories<br>for APs<br>time-out<br>messages         |
| Messages for Off-<br>cluster   | Manage Message             | All message<br>categories<br><br>Status<br>messages to<br>Monitor AP |
| OS Process Control<br>Requests | Host Operating System      | "SNDMSG" IPC<br>Primitives<br><br>OS file<br>handling<br>commands    |

#### 4.2.14 Handle Local APC Tables Function

The Handle Local APC Table function is responsible for maintaining the APC tables.

#### 4.2.14.1 Inputs

Inputs to this function are as follows:

| <u>Description</u>     | <u>Source</u>                          | <u>Range</u>                                                                          |
|------------------------|----------------------------------------|---------------------------------------------------------------------------------------|
| Table Requests         | Handle System Command Function         | Initiate, Recover (TBD), Terminate                                                    |
| OS Responses           | Host Operating System (IPC Primitives) | Time-out Event<br><br>Responses on "SNDMSG" IPC<br><br>Response on "ABORT AP Requests |
| Message Category Table | Internal Tables                        | A-J                                                                                   |
| Host Tables            | Internal Tables                        | APC Status Table<br>Host Status Table                                                 |
| APC Local Tables       | Internal Tables                        | All APC Tables                                                                        |

#### 4.2.14.2 Processing

APC Tables are maintained by the following processing (See Figure 4-24 for an overview of the tables involved.):

| <u>Event</u> | <u>Processing</u>                                                                                                                      |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------|
| APC Startup  | All APC Local Tables are initialized and built from local files or from CDM data depending on Monitor's start table command (4.2.12.2) |
| Time-out     | The following APC Dynamic Tables are processed on a time-out event:                                                                    |

Event

Time-out (Continued)

Processing

1. Message Pairing Tables - the pair table on the APC is checked for messages whose timeouts have expired. On expired messages, the AP characteristic record of the waiting AP is checked to determine whether the AP should receive a time-out message or be aborted. The appropriate action is taken by the MPU.

2. Guaranteed Delivery Table - the guaranteed delivery table entries are checked to see if an ACK from the next receiving MPU has been received. If the table indicates no response to the GD message, a status request is sent to the MPU from which a response is due.

If the table indicates an expired time with no response to a GD status request from an MPU that has been sent a status request, a status message is sent to the Monitor AP.

3. "I'm Alive" table - these table entries are checked for entries with elapsed time-outs. Those entries will cause an "Init failure" message to be sent to the Monitor AP and the MPU from which the AP initiation request was sent.

APC Shutdown

1. GD Tables are saved
2. APC Files are closed

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#### 4.2.14.3 Outputs

| <u>Description</u>            | <u>Destination</u>         | <u>Range</u>                           |
|-------------------------------|----------------------------|----------------------------------------|
| Status Messages               | Manage Message<br>messages | Status<br>to MONITOR AP<br>and to MPUs |
| Messages to On-<br>cluster AP | Deliver Message to<br>AP   | Time-out<br>messages                   |
| APC Tables                    | Internal Tables            | All APC Tables                         |

#### **4.3 Special Requirements**

##### **4.3.1 Programming Methods**

NTM programming methods shall conform to the standards set forth by General Electric in the IISS Software Development Guidelines/Conventions document [10].

##### **4.3.2 Program Organization**

This paragraph is not applicable to the NTM CPCI.

##### **4.3.3 Modification Consideration**

This paragraph is not applicable to the NTM CPCI.

##### **4.3.4 Special Features**

To facilitate the testing of the NTM CPCI, integrated application processes must be provided to act as test drivers.

##### **4.3.5 Expandability**

The NTM will be designed and implemented in a manner which provides for an expandable configuration and increasing functionality. Additional APs, clusters, hosts, and changes in hardware will be accommodated with minimal impact on the user and the system. The use of a High Order Language significantly enhances the portability of the code. Host dependent code will be used only when absolutely necessary. In these cases the code will be identified and isolated to facilitate transfer to a new host.

##### **4.3.6 Special Timing**

This paragraph is not applicable to the NTM CPCI.

#### **4.4 Human Performance**

This paragraph is not applicable to the NTM CPCI.

#### **4.5 Data Base Requirements**

##### **4.5.1 Sources and Types of Inputs**

The information identified as input to the NTM and its



component functions is defined in Section 4.2 above. The identified data items are thoroughly defined in Appendix D below.

#### 4.5.2 Destinations and Types of Output

The information identified as output from the NTM and its component functions is defined in Section 4.2 above. The identified data items are defined in Appendix D below.

#### 4.5.3 Internal Tables and Parameters

The tables required by the NTM functions are discussed below. The structure of the data items used in the tables are identified in the IDEF1 model in Appendix C below. These items are defined in Appendix D as to name, ID, description, COBOL Picture, size, coding type, IDEF1 reference, stability (static vs. dynamic), legal values, source, and where used.

Figure 4-24 provides an overview of the tables used by the NTM.

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| Table Name<br>-----                   | Table ID<br>----- | Table Location<br>-----                                 | Entry Length<br>----- | No. of Entries<br>-----       | Size<br>----- |
|---------------------------------------|-------------------|---------------------------------------------------------|-----------------------|-------------------------------|---------------|
| Message Category Table<br>(4.5.3.1)   | CAT               | Global-IISS                                             | X(7)                  | 10                            | 70 bytes      |
| Authority Table<br>(4.5.3.2)          | AUT               | Local to APC (Based on resident AP's authority to send) | X(22)                 | Variable per table instance   | Variable      |
| AP Information Table<br>(4.5.3.3)     | API               | Local to APC                                            | X(14)                 | One per AP known to IISS      | TBD (fixed)   |
| AP Status Table<br>(4.5.3.4)          | APS               | Local to AP's AP Cluster                                | X(85)                 | One per initiated AP Instance | Variable      |
| Child Table<br>(4.5.3.5)              | CLD               | Local to Parent AP's AP Cluster                         | X(39)                 | One per spawned AP            | Variable      |
| AP Characteristics Table<br>(4.5.3.6) | APT               | Local to AP's AP Cluster                                | X(24)                 | One per AP on APC             | TBD (fixed)   |
| APC Status Table<br>(4.5.3.7)         | APC               | Global-IISS                                             | X(7)                  | One per APC known to IISS     | TBD (fixed)   |
| Host Status Table<br>(4.5.3.8)        | HST               | Global-IISS                                             | X(7)                  | 3                             | 21 bytes      |
| Message Pairing Table<br>(4.5.3.9)    | MPR               | Local to sending APC                                    | X(44)                 | One per msg. pair             | Variable      |

Figure 4-24. NTM Tables - Overview

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| Table<br>Name<br>-----                        | Table<br>ID<br>----- | Table<br>Location<br>-----  | Entry<br>Length<br>----- | No. of<br>Entries<br>-----                                 | Size<br>----- |
|-----------------------------------------------|----------------------|-----------------------------|--------------------------|------------------------------------------------------------|---------------|
| Logon Table<br>(4.5.3.10)                     | LOG                  | Local to Monitor AP         | X(62)                    | One<br>per<br>logged-on<br>user                            | Vari-<br>able |
| Guaranteed<br>Delivery<br>Table<br>(4.5.3.11) | GRD                  | Local to sending<br>APC     | X(66)                    | One per<br>Guar.<br>Del.<br>Msg. sent<br>from on-APC<br>AP | Vari-<br>able |
| AP Operating<br>Information<br>(4.5.3.12)     | APO                  | Local to AP's<br>AP Cluster | X(19)                    | One<br>per<br>AP on the<br>APC                             | Vari-<br>able |
| I'm Alive<br>Table<br>(4.5.3.13)              | IAT                  | Local to AP's<br>AP Cluster | X(18)                    | One per<br>AP<br>instance in<br>Initiation<br>Mode         | Vari-<br>able |
| Link Status<br>Table<br>(4.5.3.14)            | LST                  | Local to Monitor<br>AP      | X(3)                     | One per<br>link                                            | 9             |
| Authority<br>Check Table<br>(4.5.3.15)        | ACT                  | Local to APC                | X(9)                     | One per<br>destina-<br>tion AP                             | Vari-<br>able |
| Directory<br>Table<br>(4.5.3.16)              | DIR                  | Global IISS                 | X(24)                    | One per<br>directory<br>known<br>to the IISS               | Vari-<br>able |
| Connection<br>Table<br>(4.5.3.17)             | CON                  | Local to APC                | X( )                     | One per<br>Connection                                      | Variable      |

Figure 4-24. NTM Tables - Overview (Continued)

#### 4.5.3.1 Message Category Table

This table contains the information relative to the processing required of the MPU in order to move a message through the IISS. The categories are defined primarily in terms of these processing requirements. A second, smaller, consideration in the definition of the categories is the breakdown, to a limited extent, based on end processing requirements. This breakdown resulted in the separate categorization of System Commands and AP Status Messages.

The message categories defined for the initial Test Bed are:

|   |                                                   |
|---|---------------------------------------------------|
| A | Guaranteed Delivery                               |
| B | Response required                                 |
| C | System Command - no response (to initiator)       |
| D | System Command - response (to initiator) required |
| E | Unsolicited Message                               |
| F | Solicited Message                                 |
| G | AP Status Message                                 |
| H | Initiation Message (may or may not have data)     |
| I | Message from COMM AP                              |
| J | Initiation Message - Response Required            |

The format and identified values of the message category table are shown in Figure 4-25. The individual fields are defined below.

| Field Name                | Field ID   | Field Size | Field Description                                                                                                                                                               |
|---------------------------|------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -----                     | -----      | ----       | -----                                                                                                                                                                           |
| Message Category          | CAT-MSGCAT | X          | This field contains a legal value of a message category. The table is indexed on this field using the value contained in the message header.                                    |
| Authorization Requirement | CAT-AUTREQ | X          | This field identifies whether a message conforming to a given category requires authorization at it's source AP Cluster. Authorization is defined as the determination that the |

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| Field Name<br>-----        | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----                                                                                                                                                  |
|----------------------------|-------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                   |                       | destination AP is in fact able to receive the given message type from the source AP.                                                                                        |
| Pairing Requirement        | CAT-PREQMT        | X                     | This field identifies whether a message conformed to a given message category requires pairing.                                                                             |
| Guaranteed Delivery        | CAT-GUARDL        | X                     | This field identifies whether a message conforming to a given message category requires that an acknowledgement of delivery be sent to the source of the message.           |
| Message Priority           | CAT-MSGPRY        | X                     | This field indicates the level of priority assigned to a message conforming to a given message category. The value of this field is added to the message header by the MPU. |
| Log Requirement            | CAT-LOGREQ        | X                     | This field indicates whether logging is required on a message conforming to the given category. The value is added to the message header by the MPU.                        |
| Statistics Collection Flag | CAT-STATCO        | X                     | This field indicates whether statistics are to be collected on a message conforming to the given message category. The value is added to the message header by the MPU.     |

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| Message Category | Authori-<br>zation<br>Requirement | Pairing<br>Require-<br>ment | Guaranteed<br>Delivery | Message<br>Priority | Log<br>Require-<br>ment | Statistics<br>Collection |
|------------------|-----------------------------------|-----------------------------|------------------------|---------------------|-------------------------|--------------------------|
| A                | Yes                               | No                          | Yes                    | Low                 | Yes                     | Yes                      |
| B                | Yes                               | Yes                         | No                     | Low                 | Yes                     | Yes                      |
| C                | No                                | No                          | No                     | High                | Yes                     | Yes                      |
| D                | No                                | Yes                         | No                     | High                | Yes                     | Yes                      |
| E                | Yes                               | No                          | No                     | Low                 | Yes                     | Yes                      |
| F                | No                                | Yes                         | No                     | Low                 | Yes                     | Yes                      |
| G                | No                                | No                          | No                     | Low                 | Yes                     | Yes                      |
| H                | Yes                               | No                          | No                     | Low                 | Yes                     | Yes                      |
| I                | No                                | Yes                         | No                     | Low                 | Yes                     | Yes                      |
| J                | Yes                               | Yes                         | No                     | Low                 | Yes                     | Yes                      |

Figure 4-25. Message Category Table

#### 4.5.3.2 Authority Table

Authority is defined as the fact that a given destination is able to receive a given message type from a given source. In order for a message to be authorized, the message type, message source, and message destination values given in the message header must match with a legal combination given in the authority table.

The authority table is accessed where the Authority Check Table (Section 4.5.3.15) indicates that an authority check is required on the given message. The table is indexed by the Message Source although all three values (Source, Type, and

Destination) must exist in the same unique tuple in the table.

The fields of the Authority Table are briefly described below.

| Field Name<br>-----      | Field ID<br>----- | Field<br>Size<br>----- | Field Description<br>-----                                                                                                                                                                                                |
|--------------------------|-------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Authorized<br>to Receive | AUT-ATOREC        | X(10)                  | Identifies one instance of a legal destination that is allowed to receive a given message type from a given source. The value in this field will be replicated for each tuple in which the given destination is involved. |
| Message Type             | AUT-MSGTYP        | X(2)                   | Identifies one instance of a given message type. The value in this field will be replicated for each tuple in which the given message type is involved.                                                                   |
| Authorized<br>to Send    | AUT-ATOSND        | X(10)                  | Identifies one instance of a send legal source that is allowed to send a given message type. The value in this field will be replicated for each tuple in which the given source is involved.                             |

#### 4.5.3.3 Application Process Information Table

This table contains data relative to any given Application Process. This information is always available for routing purposes.

For this purpose, the table provides the name of the AP Cluster that a given destination AP resides on. (The physical location of any AP is deliberately invisible to any other AP in order to provide maximum flexibility in the assignment of AP's to AP Clusters). The destination AP name from the message header must be mapped to it's AP Cluster via a table lookup.

The destination AP's AP Cluster is added to the header when it is found in the table.

When the message is routed, the MPU checks the destination AP Cluster field. As each MPU knows who it is, the determination can easily be made as to whether the message is to be sent on or off AP Cluster. If the destination is off-AP Cluster, a lookup is made in the AP Cluster status table (Section 7) to determine the host the AP Cluster is currently residing on. Again, the MPU can recognize it's own host and can therefore determine whether the destination is on or off host. Where the destination is off-host, the message is routed to the destination host's COMM AP Cluster. Where the message destination is on-host, the message is routed directly to the destination AP Cluster.

The format and identified values of the AP Information Table are shown in Figure 4-26. Each field is described below.

| Field Name        | Field ID   | Field Size | Field Description                                                                                                                                                                                     |
|-------------------|------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -----             | -----      | -----      | -----                                                                                                                                                                                                 |
| AP Name           | API-APNAME | X(10)      | This field contains the name of a callable entity within the IISS. It is the key field of the table and is accessed by matching the AP name contained in the destination field of the message header. |
| AP Cluster Name   | API-APCNME | X(3)       | This field contains the name of the AP Cluster upon which the given AP name resides. The value in this field may serve as a key value should the need arise to access the AP Cluster status table.    |
| Queue Server Type | API-QSTYPE | X          | This field identifies the type of chaining support required by the AP. This support may be child                                                                                                      |



| Field Name | Field ID | Size | Field Description                              |
|------------|----------|------|------------------------------------------------|
| -----      | -----    | ---- | -----                                          |
|            |          |      | chaining, message chaining,<br>or no chaining. |

#### 4.5.3.4 Application Process Status Table

This table contains dynamic data associated with an AP that has been initiated. An entry is created when an AP instance is initiated and is maintained until the AP instance's tree status indicates that the AP instance and all associated instances are terminated and cleaned up.

The table further provides the data needed to maintain the tree of AP's spawned by the given AP instance entry. This tree is kept to facilitate the logic needed to perform an Abort and to cleanup after any kind of termination.

The individual fields of the AP Status Table are described below.

| Field Name         | Field ID   | Field<br>Size | Field Description                                                                                                                                                                                                                               |
|--------------------|------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -----              | -----      | ----          | -----                                                                                                                                                                                                                                           |
| APC Name           | APS-APCNME | X(3)          | This field contains the name of the APC on which the AP resides.                                                                                                                                                                                |
| AP Name            | APS-APNAME | X(10)         | This field contains the AP name of the initiated AP.                                                                                                                                                                                            |
| Instance           | APS-INSTNC | X(2)          | This field contains the identifier of the specific instance of the initiated AP.                                                                                                                                                                |
| Original<br>Source | APS-ORGSRC | X(15)         | This field contains the AP name Instance, and resident AP Cluster of the ultimate originator of the AP. In the case of a spawned AP, the originating source is the AP that sent the transaction that "fired off" the AP at the top of the tree. |

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| Field Name<br>-----   | Field ID<br>----- | Field<br>Size<br>----- | Field Description<br>-----                                                                                                                                                                                        |
|-----------------------|-------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Immediate<br>Parent   | APS-IMMPAR        | X(15)                  | This field contains the AP name, instance, and resident AP Cluster of the AP that sent the transaction that "fired off" the given AP instance. The value in this field may match the value of originating source. |
| Child Table           | APS-CLDIND        | 9(4)                   | This field points to the AP's first Index Entry in the Child Table. (The Child Table is discussed in Section 4.5.3.5).                                                                                            |
| Message Queue<br>Flag | APS-MSGQUF        | X                      | This field indicates whether there are messages waiting for the AP in the message queue.                                                                                                                          |

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| Field Name<br>-----            | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----                                                                                                                                                                                             |
|--------------------------------|-------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pair Flag                      | APS-PRFLAG        | X                     | This field indicates whether the given AP instance has one or more outstanding waits. If the AP does not have any paired msgs outstanding, the flag will be null. The Message Pairing Table is discussed in Section 9. |
| AP Status                      | APS-APSTAT        | X                     | This field provides the current structure and operating status of the AP and its "tree" of AP's spawned by the given AP.                                                                                               |
| Message Serial<br>Last Queued  | APS-SERNLQ        | X(10)                 | The Serial # and source AP Cluster of the last message placed in the AP instance's queue. This information will be used to recover the state of the AP.                                                                |
| Guaranteed<br>Delivery<br>Flag | APS-GDFLAG        | X                     | This field indicates whether the given AP has one or more guaranteed delivery messages outstanding. The Guaranteed Delivery table is discussed in Section 11.                                                          |
| Number of<br>Connections       | APS-NOCONN        | X(2)                  | This field indicates the current number of sources that are currently connected to an instance of a Queue Server. Where the given AP is not a Queue Server, this field will be null.                                   |
| Logical<br>Channel ID          | APS-CHANID        | X(3)                  | This field identifies the logical channel under which the given AP instance was initiated.                                                                                                                             |

| Field Name<br>-----   | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----                                                       |
|-----------------------|-------------------|-----------------------|----------------------------------------------------------------------------------|
| Children              | APS-CHLDRN        | X                     | This field indicates whether the given AP has any child AP's associated with it. |
| Message In Queue      | APS-NMSA          | X(4)                  | Identifies the Number of Messages in Queue for the AP.                           |
| Last Key Pointer      | APS-LSTKEY        | X(9)                  | Pointer to the last key value for the given AP in the AP Queue Table.            |
| First Pseudo Instance | APS-FPINST        | X                     | This field points to the first entry in the Connection Table for the given AP.   |
| Last Pseudo Instance  | APS-LPINST        | X                     | This field contains the last Pseudo Instance number assigned to the AP.          |

#### 4.5.3.5 Child Table

One instance of a child table is used to maintain one level of the tree of chained AP's. This table is in effect a linked list of AP's spawned by a common parent. This parent may also be a child AP itself. The table has an entry for every instance of an AP spawned by an on-WS AP.

The child table is accessed when the parent is abnormally terminated (aborted) in order to abnormally terminate any AP's that were spawned by the parent. As a child AP may also be a parent AP, its children would also be abnormally terminated. The table is also used to facilitate cleanup on any termination (normal or abnormal).

The fields of the Child Table are described below.

| Field Name<br>-----   | Field<br>ID<br>--- | Field<br>Size<br>---- | Field Description<br>-----                                                                                                 |
|-----------------------|--------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------|
| Child AP<br>Cluster   | CLD-APCNME         | X(3)                  | This field contains the name<br>of the AP Cluster that the<br>child AP resides on.                                         |
| Child<br>Parent       | CLD-PARNME         | X(12)                 | The Process Name of the<br>child AP's parent.                                                                              |
| Child Rank            | CLD-RANK           | 9(4)                  | The ranking assigned to the<br>child AP when the table<br>entry is made.                                                   |
| Child AP<br>Name      | CLD-APNAME         | X(10)                 | This field contains the AP<br>Name of the spawned AP.                                                                      |
| Child Status          | CLD-CLDSTS         | X                     | The child status indicates<br>the operational status of<br>the child AP.                                                   |
| Next Sibling<br>Index | CLD-NXTSIB         | 9(4)                  | This field provides an index<br>to the next child AP spawned<br>by the common parent AP.                                   |
| Logical<br>Channel ID | CLD-CHANID         | X(3)                  | This field identifies the<br>logical channel under which<br>the given Child AP was<br>spawned.                             |
| Reserved<br>Code      | CLD-RESCDE         | X                     | This field indicates whether<br>the entry is confirmed or<br>reserved.                                                     |
| Number<br>Tries       | CLD-CTRIES         | X                     | This field indicates how<br>long the entry has<br>been reserved. At a given<br>point, a reserved entry will<br>be deleted. |

#### 4.5.3.6 AP Characteristics Table

This table provides the processing characteristics of a given AP in accordance with it's type. The table is used to determine how to handle a given AP on the occurrence of various events. As the characteristics of an AP are not directory

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| Field Name<br>-----                  | Field ID<br>----- | Size<br>---- | Field Description<br>-----                                                                                            |
|--------------------------------------|-------------------|--------------|-----------------------------------------------------------------------------------------------------------------------|
| AP Name                              | APT-APNAME        | X(8)         | The AP Name of the given AP. This field serves as the key to the table.                                               |
| Maximum Number<br>Queued<br>Messages | APT-NOAMSG        | X(2)         | The maximum number of of messages allowed in the AP's queue at any one time.                                          |
| Maximum<br>Instances                 | APT-MAXINS        | X(2)         | This field defines the maximum number of instances of the given AP that can be awake at any one time.                 |
| Number of<br>Parents per<br>Instance | APT-NOPINS        | X(2)         | The maximum number of parents allowed to one instance of the AP at any one time                                       |
| Initiation<br>Needs                  | APT-ININDS        | X            | This field identifies whether the AP requires a specific initiation message or can be started by any kind of message. |
| On Abort                             | APT-ONABT         | X            | This field indicates how the given AP is to be handled when an Abort message arrives for it.                          |
| Number of<br>Mailboxes               | APT-NUMMBX        | X            | This field indicates the number of mailboxes an AP will support.                                                      |
| On-Shutdown                          | APT-ONSTDN        | X            | This field indicates whether the given AP has the internal logic to handle shutdown.                                  |
| On-Recovery                          | APT-ONREC         | X            | This field indicates whether the given AP has the internal logic to handle recovery.                                  |

| Field Name<br>-----                 | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----                                                                                         |
|-------------------------------------|-------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|
| On-Child<br>Normal<br>Termination   | APT-ONCLDT        | X                     | This field indicates how the given AP is to be treated upon the normal termination of a child AP.                  |
| On-Child<br>Abnormal<br>Termination | APT-ONCLDA        | X                     | This field indicates how the given AP Abnormal is to be treated upon the Abnormal Termination of a child AP.       |
| On-Child<br>Shutdown                | APT-ONCLDS        | X                     | This field indicates how the given AP is to be treated upon the shutdown of a child AP.                            |
| Timeout<br>Handling                 | APT-TMOHDL        | X                     | This field contains a code which represents how the given AP is to be handled in the even of a timeout expiration. |
| AP Priority                         | APT-APPRTY        | X                     | This field provides the priority level of the given AP.                                                            |

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specific, the directory prefix is not used in this table.

The fields of the AP Characteristics Table are briefly described below.

#### 4.5.3.7 AP Cluster Status Table

This table serves to identify both the location of a AP Cluster within the IISS and its current operating status.

The table is accessed primarily for routing purposes in order to determine if the destination of a given message is on or off host. The table may also be used to check the status of a destination AP Cluster prior to sending a message.

Each field of the AP Cluster Status Table is defined below.

| Field Name<br>-----           | Field<br>ID<br>----- | Field<br>Size<br>----- | Field Description<br>-----                                                                           |
|-------------------------------|----------------------|------------------------|------------------------------------------------------------------------------------------------------|
| AP Cluster<br>Name            | APC-APCNME           | X(3)                   | This field is the key to the table. It identifies an instance of a AP Cluster on the IISS.           |
| AP Cluster<br>Status          | APC-APCSTS           | X                      | This field identifies the current operational status of the given AP Cluster.                        |
| AP Cluster<br>Logical<br>Host | APC-HSTNAM           | X(3)                   | This field identifies the logical host machine within the IISS that the given AP Cluster resides on. |

#### 4.5.3.8 Host Status Table

This table serves to provide the current operational status of a host machine on the IISS. It is called out as a separate table in order to provide the flexibility of adding more host specific data in the future.

The fields of the Host Status Table are described below.

| Field Name<br>-----   | Field<br>ID<br>----- | Field<br>Size<br>----- | Field Description<br>-----                                                                           |
|-----------------------|----------------------|------------------------|------------------------------------------------------------------------------------------------------|
| Logical<br>Host Name  | HST-HSTNAM           | X(3)                   | This field is the key to the table. It identifies an instance of a logical host machine on the IISS. |
| Host Status           | HST-HSTSTS           | X                      | This field identifies the current operational status of the given physical host.                     |
| Physical<br>Host Name | HST-PHYHST           | X(3)                   | This field maps the given logical host name to it's physical host name.                              |



#### 4.5.3.9 Message Pairing Table

The message pairing table serves to track a given dialog between APs on the IISS system. Messages conforming to categories requiring pairing services (category B, D, F, and J) will be tracked via this table.

When a message conforming to Category B, D, or J is generated on a AP Cluster, an entry will be made in the table for that AP Cluster. A timeout will be set on the pair, its duration to be either user defined or a system wide default value. Should a message conforming to Category F come into the AP Cluster before the timeout period expires, it will be matched to an existing entry in the table based on the original source and channel ID fields in the two messages. When a match is made, it will constitute a post thereby canceling the wait, the timeout, and the entry in the table. Should the timeout expire before a post is set, the wait will be cancelled and should the Category F message arrive after the fact, it will be rejected.

The overall purpose of this table is to provide the status of paired messages to the originating source of the request upon the occurrence of three significant events; the setting of a post; the expiration of the timeout; or upon a paired message status request from the NTM system services.

The fields of the Message Pairing Table are described below.

| Field Name              | Field ID   | Field Size | Field Description                                                                        |
|-------------------------|------------|------------|------------------------------------------------------------------------------------------|
| -----                   | --         | ----       | -----                                                                                    |
| Paired Message APC Name | MPR-APCNME | X(3)       | Identifies the source APC of the paired message.                                         |
| Original Source AP      | MPR-MSGSRC | X(15)      | This field contains the source of the "request" end of the message pair.                 |
| Timeout Time            | MPR-TMOUTH | X(23)      | This field contains the system clock time when the timeout on the given message expires. |
| Logical Channel ID      | MPR-CHANID | X(3)       | Identifies the logical channel under which the paired message was sent.                  |

#### 4.5.3.10 Log-On Table

The Log-on Table will maintain information regarding the human users currently logged on to the IISS. The data will be supplied to the monitor AP by the User Interface upon successful Log-on. The NTH will have no awareness of an unsuccessful logon.

The fields of the Logon Table are described below.

| Field Name<br>-----    | Field<br>ID<br>-- | Field<br>Size<br>---- | Field Description<br>-----                                                                                     |
|------------------------|-------------------|-----------------------|----------------------------------------------------------------------------------------------------------------|
| UI(AP)Name             | LOG-APNAME        | X(10)                 | This field contains the AP Name of the AP Cluster name of the UI where the given user is logged on.            |
| APC Name               | LOG-APCNME        | X(3)                  | Identifies the AP Cluster that the given UI AP resides on.                                                     |
| Terminal ID            | LOG-TERMID        | X(2)                  | This field identifies the terminal where the given user is logged on. This is the instance of the UI(AP) Name. |
| User Name              | LOG-USRNAM        | X(8)                  | This field contains the User Name of the user logged on at the given AP instance.                              |
| Role Name              | LOG-ROLENM        | X(10)                 | This field identifies the role under which the given user is logged on.                                        |
| Session<br>Start Time  | LOG-STRTME        | X(23)                 | This field contains the system clock time when the given user's logon request was accepted.                    |
| Channel<br>Range Start | LOG-CHANST        | X(3)                  | The lowest Logical Channel ID in the range of ID's allocated to the user at logon.                             |

| Field Name           | Field ID   | Field Size | Field Description                                                                   |
|----------------------|------------|------------|-------------------------------------------------------------------------------------|
| -----                | --         | ----       | -----                                                                               |
| Channel<br>Range End | LOG-CHANED | X(3)       | The highest Logical Channel ID in the range of ID's allocated to the user at logon. |

#### 4.5.3.11 Guaranteed Delivery Table

This table is used to record all guaranteed delivery messages that originate on a given AP Cluster. The table is used to provide the age of a message to ensure that it does not remain on the system forever.

The fields of the Guaranteed Delivery Table are described below.

| Field Name                  | Field ID   | Field Size | Field Description                                                                                                                                                                                   |
|-----------------------------|------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -----                       | -----      | ----       | -----                                                                                                                                                                                               |
| Message<br>Source           | GRD-MSGSRC | X(15)      | This field contains the AP Name, instance identifier and work-station of the AP that sent the guaranteed delivery message.                                                                          |
| Message<br>Serial<br>Number | GRD-MSGSN  | X(7)       | This field contains the serial number that was assigned to the message by the MPU.                                                                                                                  |
| Time Stamp<br>When Accepted | GRD-TSTAMP | X(23)      | This field contains the time when the given guaranteed delivery message was accepted by the source MPU as a valid IISS message. This time provides the base for determining the age of the message. |
| Message<br>Destination      | GRD-MSGDST | X(15)      | This field contains the AP Name and AP Cluster of the destination AP as specified in the header of the                                                                                              |

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| Field Name              | Field ID   | Field Size | Field Description                                                                                                      |
|-------------------------|------------|------------|------------------------------------------------------------------------------------------------------------------------|
| -----                   | -----      | ----       | -----                                                                                                                  |
|                         |            |            | guaranteed delivery message.                                                                                           |
| Pointer to Message File | GRD-MFNPTR | X(6)       | This field points to the file in non-volatile memory where the given guaranteed delivery message has been journalized. |

#### 4.5.3.12 AP Operating Information Table

This table provides the current operational information about a generic AP (as opposed to a specific instance of it).

The fields of the AP Operating Information Table are defined below.

| Field Name<br>-----                 | Field ID<br>----- | Size<br>---- | Field Description<br>-----                                                                          |
|-------------------------------------|-------------------|--------------|-----------------------------------------------------------------------------------------------------|
| APC Name                            | APO-APCNME        | X(3)         | The name of the APC that the active AP resides on.                                                  |
| AP Name                             | APO-APNAME        | X(8)         | This field in combination with the APC name is the key to the table.                                |
| Instances<br>Currently<br>Running   | APO-NUMINS        | X(2)         | This field provides the number of instances of the given AP that are currently in operation.        |
| Last Instance<br>Number<br>Assigned | APO-LSTINS        | 9(4)         | This field provides the last instance number assigned to an instance of the given AP.               |
| Number of<br>Messages               | APO-NUMMSG        | X(2)         | This field indicates the number of messages in the message queue that are waiting for the given AP. |

#### 4.5.3.13 I'm Alive Table

This table is used to track AP's that have been initiated but are not yet running. As each entry will be maintained for a limited amount of time (# of tries) it also insures that an initiation problem is detected.

The fields are defined below.

| Field Name<br>----- | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----         |
|---------------------|-------------------|-----------------------|------------------------------------|
| APC Name            | IAT-APCNME        | X(3)                  | The APC of the AP being initiated. |

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| Field Name<br>-----  | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----                                                                                                                             |
|----------------------|-------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| AP Name              | IAT-APNAME        | X(10)                 | The name of the AP being initiated.                                                                                                                    |
| Instance             | IAT-INSTNC        | X(2)                  | The instance ID assigned to the given AP being initiated.                                                                                              |
| ACK to Source<br>MPU | IAT-MPUACK        | X                     | Identifies whether the message causing the initiation conforms to Category E thereby requiring an ACK to be sent to the source MPU upon AP initiation. |
| Data Code            | IAT-DATACD        | X                     | Indicates whether there is data waiting for the given AP.                                                                                              |
| Number of<br>Tries   | IAT-NTRIES        | X                     | Tracks the number of times the entry has been checked against the AP Status Table.                                                                     |

#### 4.5.3.14 Link Status Table

The Link Status Table provides the current operational status of the link between two given physical host machines.

The fields of the Link Status Table are defined below.

| Field Name<br>----- | Field ID<br>----- | Field<br>Size<br>---- | Field Description<br>-----                                        |
|---------------------|-------------------|-----------------------|-------------------------------------------------------------------|
| Link ID             | LST-LINKID        | X(2)                  | Identifies a specific link between two host machines on the IISS. |
| Link Status         | LST-LKSTAT        | X                     | The current status of the given link.                             |

#### 4.5.3.15 Authority Check Table

This table provides an authority precheck for messages conforming to categories requiring authorization. This is due to the situation where the message implies authorization but the destination AP has waived the requirement. This allows the AP developer the right to either restrict access to the AP (on those messages requiring authorization) or to open the AP to any and all sources. Where access is restricted, the AP developer will inform the CDM Administrator as to the sources allowed access and the message types accepted. This information will be contained in the authority table.

The Authority Check Table will be accessed by the MPU on all messages requiring authorization. Where the destination access is open, the MPU will continue message management processing. Where the destination access is restricted, the MPU will proceed to check the message against the Authority Table as described in Section 4.5.3.2. At present, the authority check is not concerned with the directory the AP is in.

The Authority Check Table fields are described below.

| Field Name            | Field ID   | Field Size | Field Description                                                                                                |
|-----------------------|------------|------------|------------------------------------------------------------------------------------------------------------------|
| (Destination) AP Name | ACT-APNAME | X(8)       | The key field in the table. The Destination AP Name from the header is matched to an entry in this field.        |
| Access Flag           | ACT-ACCFLG | X          | Identifies whether the access to the destination AP (on messages requiring authorization) is restricted or open. |

#### 4.5.3.16 Directory Table

This table provides the link between a directory prefix and the directory name to which it refers. The use of the directory prefix allows an AP's executable module to be located in a directory other than the directory in which the IISS is run.

The directory prefix is used in all AP Interface service

calls as a given AP may exist as different versions in different directories (i.e., production version vs. test version). AP's having the same base (5 character) name must adhere to a common set of characteristics regardless of the number of versions in existence.

The individual fields of the directory table are defined below.

| Field Name       | Field ID   | Field Size | Field Description                                                                                                             |
|------------------|------------|------------|-------------------------------------------------------------------------------------------------------------------------------|
| -----            | -----      | -----      | -----                                                                                                                         |
| Directory Prefix | DIR-PREFIX | X(2)       | The identifier assigned to a given directory. This ID is used as part of the AP's name when the AP's directory must be known. |
| Directory Name   | DIR-DIRNME | X(20)      | The name of the directory identified by the prefix. This field includes the brackets and period.                              |
| Directory Length | DIR-NMELEN | X(2)       | The length in bytes of the directory name including the period but excluding the brackets.                                    |

#### 4.5.3.17 Connection Table

The NTM supports AP's known as Queue servers. Within the type queue server are the sub-types of multiple-parent or single-source. As these AP's may serve a number of source AP's during a single run, they cannot be tracked by the current NTM child chaining mechanism. As a result, the geneology of a given source AP will be broken when the path encounters a queue server. In order to maintain this geneology, the NTM will, given the characteristic of an AP requiring Message chain support, track (chain) a message at the point at which it encounters a queue server.

In order to handle the tracking of messages at a queue server AP, an entry will be made in that AP's connection table. This entry establishes a "Pseudo" Instance or connection which is considered to be a separate instance of the AP. The connection table entry contains values pertinent to the



particular connection as opposed to the AP instance itself. Therefore, in one AP instance there may be two connections, one of which has child AP's and one which may not. In this manner, the geneology may be traced beyond a queue server.

As for the child table, the connection table is maintained as a linked list with a pointer from the AP's table to the first entry for the AP.

The individual fields of the connection Table are described below.

| Field Name<br>-----    | Field ID<br>----- | Field<br>Size<br>----- | Field Description<br>-----                                                                                                                                       |
|------------------------|-------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pseudo Instance        | CON-PINST         | X                      | Identifies the Pseudo instance assigned to the given connection. This value may also be carried in the APs table to provide a pointer into the connection table. |
| Client Name            | CON-CLNAME        | X(10)                  | The name of the source AP of the given connection.                                                                                                               |
| Client Pseudo Instance | CON-CLPINS        | X                      | The pseudo instance of the source AP is included if the source AP is also a queue server. If the source is not a queue server this field will be blank.          |
| Child Rank             | CON-CLDRNK        | 9(4)                   | As in the APs table, this field points to the first child entry associated with the given connection.                                                            |
| Pair Flag              | CON-PRFLG         | X                      | Indicates whether the given connection has outstanding paired messages.                                                                                          |
| Children               | CON-CHILD         | X                      | Indicates whether the given connection has any child AP's associated with it.                                                                                    |

| Field Name         | Field ID   | Field Size | Field Description                                                                                                                                           |
|--------------------|------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -----              | -----      | -----      | -----                                                                                                                                                       |
| Connection Channel | CON-CONCHN | X(3)       | The channel ID from the message that established the given connection.                                                                                      |
| Next Connection    | CON-NXTCOM | X          | Pointer to the next Pseudo instance associated with the Queue Server AP. The end of the chain is indicated where the last pseudo instance points to itself. |

#### 4.6 Adaptation Requirements

The NTM must be compiled, linked and installed on each host in the IISS Test Bed. The Test Bed consists of a VAX-11/780 (VMS operating system), IBM 3033 (CICS under MVS SP1.1 operating system) and Honeywell Level 6 (GCOS400 operating system).

NTM modules that are machine specific must be included in the IISS system built on each host. As a goal it would be desirable to have the host specific statements conditionally compiled or assembled based on host type input. Adding a new host type requires writing these machine specific modules for that host.

#### 4.7 Government Furnished Property List

This paragraph is not applicable to the NTM CPCI.

## SECTION 5

### QUALITY ASSURANCE PROVISIONS

#### 5.1 Introduction and Definition

The NTM Quality Assurance will be coordinated with the IISS integration contractor, General Electric Company, to ensure that it supports the QA needs for the IISS.

The philosophy of Quality Assurance involves more than simply testing code. QA begins with Requirements Definition and continues throughout the System life Cycle. Quality assurance provisions involve software engineering standards, tools, methodologies, procedures, guidelines, and control mechanisms. Procedures and guidelines for testing are of particular importance in the assurance of a quality product.

Testing of NTM code will occur at two levels. First, unit level tests will be performed by NTM developers for each major portion of code to detect coding errors and errors resulting from the interaction of modules. Unit level testing will take place for each release of the NTM. Second, NTM developers will support General Electric in IISS Test Bed Integration Testing for each IISS release.

Integration testing will be done on the IISS Test Bed facilities provided for that purpose by General Electric.

## **5.2 Computer Programming Test and Evaluation**

### **5.2.1 Test Approach**

Testing of code is driven by scenarios written to reflect the requirements stated in Section 4 of this document. Figure 5-1 provides a matrix of requirements to test cases. The specific tests are described in detail in Section 5.2.4. The implementation of these scenarios include small integrated test AP's having the characteristics noted in the scenarios. The scenarios include (but are not limited to):

- Startup Host
- Startup IISS
- Accept Logon message from UI
- Initiate an AP using CALL "ISEND"
- Initiate an AP using CALL "NSEND"
- Maintain the status of an AP from initiation through normal termination
- Abort an AP from an Operator Command
- Accept Logoff message from UI
- Build NTM tables from file
- Handle host to host communications between AP's
- Shutdown Host
- Shutdown IISS

| <u>DS<br/>Ref.</u> | <u>NTM DS Requirement</u>                   | <u>Test Case</u>                                                                                                                                    |
|--------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1.2.1            | Interface to New AP's<br>(System Services)  |                                                                                                                                                     |
|                    | INITAL                                      | All Support Test AP's                                                                                                                               |
|                    | ISEND                                       | TSPUIMPU-Choice-3                                                                                                                                   |
|                    | NSEND                                       | TSPUIMPU-Choices-1,2                                                                                                                                |
|                    | RCV                                         | All Test AP's                                                                                                                                       |
|                    | TRMNAT                                      | All Test AP's                                                                                                                                       |
|                    | GETUSR                                      | TSPUIMPU-Choice-3                                                                                                                                   |
|                    | CHKMSG                                      | TSPUIMPU-Choice-3                                                                                                                                   |
|                    | GDSEND                                      | TSGDMMPU                                                                                                                                            |
|                    | SETDLY                                      | Logic Not Implemented                                                                                                                               |
|                    | SIGERR                                      | TSSIGMPU                                                                                                                                            |
|                    | GDACK                                       | TSGDRMPU                                                                                                                                            |
|                    | TSTMOD                                      | TSSUIMPU                                                                                                                                            |
|                    | APSTAT                                      | Logic Not Implemented                                                                                                                               |
|                    | HSTATS                                      | Logic Not Implemented                                                                                                                               |
|                    | WHTHST                                      | TSNTMMPU Choice 8                                                                                                                                   |
|                    | WHATAC                                      | Logic Not Implemented                                                                                                                               |
|                    | WKONCA                                      | Logic Not Implemented                                                                                                                               |
|                    | ACSTAT                                      | Logic Not Implemented                                                                                                                               |
|                    | SIGABT                                      | Logic Not Implemented                                                                                                                               |
|                    | PRSTAT                                      | Logic Not Implemented                                                                                                                               |
|                    | GDSTAT                                      | Logic Not Implemented                                                                                                                               |
| 4.1.2.2            | Interface to Existing AP's                  | TBD                                                                                                                                                 |
| 4.1.2.3            | Interface to COMM AP's<br>(System Services) |                                                                                                                                                     |
|                    | INICOM                                      | Startup (Start COMVH)                                                                                                                               |
| 4.1.2.4            | Interface to UI<br>(System Services)        |                                                                                                                                                     |
|                    | INITEX                                      | Run TSPUIMPU,<br>TSNTMMPU, TSSERMPU or<br>TST12MPU<br>LOGON Run TSPUIMPU,<br>TSNTMMPU, TSSERMPU or<br>TST12MPU LOGOFF<br>Run TSPUIMPU,<br>TSNTMMPU, |

Figure 5-1. Requirement to Test Matrix

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| <u>DS<br/>Ref.</u> | <u>NTM DS Requirement</u>                                                                                                                                                                                                                                                                                                            | <u>Test Case</u>                                                                                                                                                                                                                                                                                                                         |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | CHGROL                                                                                                                                                                                                                                                                                                                               | TSSERMPU or TST12MPU<br>TSTNTMMPU-Choice-1                                                                                                                                                                                                                                                                                               |
| 4.1.2.5            | Interface to IISS Operator<br>(Operator Commands)<br>Start IISS<br>Start APC<br>Start Link<br>Shutdown Host<br>Shutdown APC<br>Shutdown IISS<br>Cancel IISS Shutdown<br>Abort AP<br>Display Active AP's<br>Display IISS Status<br>Enable Sigerr Messages<br>Disable Sigerr Messages<br>Select Logging Features<br>Start New Log File | (at Operator Console)<br>Run Monitor<br>Enter "ST" Command<br>Enter "SL" Command<br>Logic Not Implemented<br>Enter "SC" Command<br>Enter "SD" Command<br>Enter "CN" Command<br>Logic Not Implemented<br>Enter "DA" Command<br>Enter "DS" Command<br>Enter "SE" Command<br>Enter "SO" Command<br>Enter "LG" Command<br>Enter "SN" Command |
| 4.1.3.1            | Message Header                                                                                                                                                                                                                                                                                                                       | All                                                                                                                                                                                                                                                                                                                                      |
| 4.1.3.2            | Monitor IISS                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                          |
| 4.1.3.2.1          | Accept IISS Operator<br>Commands                                                                                                                                                                                                                                                                                                     | Enter Commands at<br>Operator Console                                                                                                                                                                                                                                                                                                    |
| 4.1.3.2.2          | Service Commands<br>Start IISS on VAX<br>Start IISS on Non-Vax<br>Hosts<br>Start APC<br>Start Link<br>Shutdown APC<br>Shutdown IISS<br>Shutdown Host<br>Cancel IISS Shutdown<br>Abort AP<br>Display Active AP's<br>Display IISS Status                                                                                               | Run Monitor (VAX)<br>Run Monitor (HL6)<br><br>Enter "ST" Command<br>Enter "SL" Command<br>Enter "SC" Command<br>Enter "SD" Command<br>Logic Not Implemented<br>Enter "CN" Command<br>Logic Not Implemented<br>Enter "DA" Command<br>Enter "DS" Command                                                                                   |

Figure 5-1. Requirement to Test Matrix (Continued)

| <u>DS<br/>Ref.</u> | <u>NTM DS Requirement</u>                                                                                                                                                                                                                  | <u>Test Case</u>                                                                                                                                                                                                                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1.3.2.3          | Deliver IISS Status Messages to Operator                                                                                                                                                                                                   | All Test AP's,<br>Startup, Execute<br>Operator Commands                                                                                                                                                                                                                                                                 |
| 4.1.3.2.4          | Accept Messages From:<br>IISS APC's<br>IISS AP's<br>Remote Monitor AP's                                                                                                                                                                    | Startup IISS<br>All test AP's<br>Logic Not Implemented<br>on Remote Host                                                                                                                                                                                                                                                |
| 4.1.3.2.5          | Send IISS System Commands and Responses<br><br>Operator Abort<br>Start Link<br><br>Cancel Shutdown<br><br>Start MPU<br><br>List Request<br>Shutdown Link<br>Shutdown Pending<br><br>Table Status Return<br>Shutdown Host<br>Rebuild Tables | (at Operator's Console)<br>Logic Not Implemented<br>Startup, enter "SL" Command<br>Startup, enter "CN" Command<br>Startup, enter "ST" Command<br>Enter "DA" Command<br>Enter "LS" Command<br>Enter "SD" Command<br>with one or more minutes until shutdown<br>Startup<br>Logic Not Implemented<br>Logic Not Implemented |
| 4.1.3.2.6          | Process Messages<br><br>Link Active<br><br>Link Fail<br><br>Processing Error<br>APC Terminated                                                                                                                                             | (Error Message Displayed at Operator's Console)<br>Startup, Result of "SL" Command<br>Startup, Result of "LS" Command, Shutdown All<br>Startup, Shutdown, Result of "SC" Command                                                                                                                                        |

Figure 5-1. Requirement to Test Matrix (Continued)

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| <u>DS<br/>Ref.</u> | <u>NTM DS Requirement</u> | <u>Test Case</u>                             | : |
|--------------------|---------------------------|----------------------------------------------|---|
|                    | Logon                     | TSPUIMPU, TSNTMMPU,<br>TSSERMPU,<br>TST12MPU | . |
|                    | Logoff                    | TSPUIMPU, TSNTMMPU,<br>TSSERMPU,<br>TST12MP  | . |
|                    | Table Status Request      | Startup IISS                                 |   |
|                    | Shutdown Host             | Logic Not Implemented                        |   |
|                    | APC Alive                 | Startup IISS, "ST"<br>Command                |   |
|                    | Resource Unavailable      | Upon Receipt of "RU"<br>Message from MPU     |   |

Figure 5-1. Requirement to Test Matrix (Continued)



| <u>DS<br/>Ref.</u>   | <u>NTM DS Requirement</u>                                                                                                               | <u>Test Case</u>                                                                                                                                                                                                              |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.1.3.2.6<br>(Cont.) | AP Interface Error<br><br>Tables Rebuilt<br>Timeout Expired                                                                             | Upon Receipt of "AI"<br>Message from MPU<br>Logic Not Implemented<br>Upon Receipt of "TE"<br>Message from MPU                                                                                                                 |
| 4.1.3.2.7            | Send IISS Status Message<br>Global Table Update<br>Host Available<br>Host Active<br><br>OFF-Host Shutting Down<br><br>APC Shutting Down | Logic Not Implemented<br>Logic Not Implemented<br>Startup, also Upon<br>Receipt of "LA"<br>Message<br>Upon Receipt of "LF"<br>Message<br>Logic Not Implmented<br>Directly- function<br>handled via APC<br>Status Table Update |
| 4.1.3.2.8            | Receive and Process<br>Status Messages from<br>Remote Monitor                                                                           |                                                                                                                                                                                                                               |
| 4.2.1                | Receive and Interpret<br>Message                                                                                                        | Startup, Execute<br>Operator Commands,<br>All Test AP's                                                                                                                                                                       |
| 4.2.2                | Authorize Message                                                                                                                       | Authority Check - All<br>Test AP's Authority<br>Table-Table not<br>Populated                                                                                                                                                  |
| 4.2.3                | Complete Message Header<br>Logoff                                                                                                       | All Test APs<br>TSPUIMPU, TSNTMPU,                                                                                                                                                                                            |
| 4.2.4                | Perform Special Message<br>Handling<br>Paired Messages                                                                                  | TSPUIMPU-Choice-3,                                                                                                                                                                                                            |

Figure 5-1. Requirement to Test Matrix (Continued)

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| <u>DS<br/>Ref.</u> | <u>NTM DS Requirement</u>                                                                                                              | <u>Test Case</u>                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | GD Messages<br>Specific Initiation<br>Messages                                                                                         | TSNTMMPU-Choice-4,<br>TSSERMPU-Choice 3 and<br>5, TST12MPU-choice-3<br>Logic Not Implemented<br>TSPUIMPU-Choice-3,<br>TSNTMMPU-Choice-5,<br>TST12MPU-Choice-3 and<br>4                                                                                                                              |
| 4.2.5              | Log Message                                                                                                                            | Startup, Execute<br>Operator Commands,<br>All Test AP's                                                                                                                                                                                                                                             |
| 4.2.6              | Route and Send<br>Message                                                                                                              | Startup, Shutdown,<br>All Test AP's,<br>Execute Operator<br>Commands                                                                                                                                                                                                                                |
| 4.2.7              | Interpret Message<br>Category                                                                                                          | Startup, Shutdown,<br>All Test AP's,<br>Execute Operator<br>Commands                                                                                                                                                                                                                                |
| 4.2.8              | Initiate AP                                                                                                                            | TSPUIMPU-Choices-1-5,<br>TSNTMMPU-Choices-2-5                                                                                                                                                                                                                                                       |
| 4.2.9              | Deliver Messages to AP                                                                                                                 | All Test AP's                                                                                                                                                                                                                                                                                       |
| 4.2.10             | Accept Requests from AP<br>(System Services)<br>GETUSR<br><br>INITAL<br><br>TRMNAT<br>ENDRCY<br>NSEND<br>GDSEND<br>ISEND<br><br>CHKMSG | (AP's Using Services)<br>TSAP3MPU, TSAP4MPU,<br>TSAP7MPU, TSAP8MPU,<br>TSAP9MPU, TSAPDMPU<br>All Test AP's on APC<br>Tlv<br>All Test AP's<br>Logic Not Implemented<br>All Test AP's<br>TSGDMMPU<br>TSNTMMPU, TSPUIMPU, TSS<br>ERMPU, TST12MPU<br>TSPUIMPU, TSNTMMPU, TSS<br>ERMPU, TSAP8MPU, TST12M |

Figure 5-1. Requirement to Test Matrix (Continued)

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| <u>DS<br/>Ref.</u> | <u>NTM DS Requirement</u>                                                                             | <u>Test Case</u>                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | SETDLY<br>GDACK<br>MSGACK<br>RCV<br>TSTMOD<br>CHGROL                                                  | TSAP5MPU, TSAP6MPU,<br>PU<br>Logic Not Implemented<br>Logic Not Implemented<br>Logic Not Implemented<br>All Test AP's<br>TSSUIMPU<br>TSNTMMPU-Choice-1                                                                           |
| 4.2.11             | Terminate AP<br>Abort AP<br>Shutdown AP with Logic<br><br>AP without Logic<br>Normal Termination      | Logic Not Implemented<br>TSPUIMPU, TSNTMMPU,<br>TSSERMPU<br>TSAP1MPU, TSAP9MPU<br>All Test AP's (via<br>TRMNAT)                                                                                                                  |
| 4.2.12             | Handle System Commands<br>Start APC<br><br>Shutdown AP<br><br><br>Shutdown APC<br>Display Active AP's | Upon Receipt of "ST"<br>Command<br>Direct Command Not<br>Implemented (AP<br>Shutdown only as the<br>result of Shutdown<br>APC or Shutdown<br>IISS Command)<br>Upon Receipt of "SC"<br>Command<br>Upon Receipt of "DA"<br>Command |
| 4.2.13             | Handle APC Message Queues<br>I'm Alive Queue<br>Off-APC Queue<br>Initiation Message Queue             | TSPUIMPU-Choices-1-3<br>TSPUIMPU-Choice-1,<br>TSSERMPU-Choice-2<br>TSNTMMPU-choice-2                                                                                                                                             |
| 4.2.14             | Handle APC Tables                                                                                     | All Test AP's require<br>table handling                                                                                                                                                                                          |

Figure 5-1. Requirement to Test Matrix (Continued)

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Each scenario includes specific input data (some of which will be intentionally wrong), the expected processing, and expected output. The results are verified by "canned" messages written into the test AP's. The NTM Message Log and IPC ERRPRO will be used to provide data on internal processing. A third verification tool is the Monitor AP's capability to display error messages to the IISS Operator.

### 5.2.2 Test Plan

The testing of the NTM is facilitated by a primary test driver, TSPUI. This driver was designed to simulate the User Interface, hence it's name - Pseudo UI. This allows user interaction, error and status displays, and testing of code specifically designed to support the UI.

TSPUI gets Logon information from the user and then presents the user with a menu of choices as shown in Figure 5-2.

```
$ RUN TSPUIMPU
ENTER USER NAME-MAXIMUM OF 8 CHARACTERS.
CROSS
ENTER ROLE NAME-MAXIMUM OF 10 CHARACTERS.
TESTER
(Date and Time of Logon)
      1          RUN AP1
      2          RUN AP2
      3          RUN AP3
      4          RUN TSPQS
      5          QUIT
      6          LOOP-3
      7          LOOP-1
ENTER CHOICE NUMBER
```

Figure 5-2. TSPUIMPU Menu

The user enters a choice thereby setting in motion a specific test.

TSPUIMPU has grown too large to incorporate all the test choices needed to exercise the NTM code. Four more test drivers have been created using the TSPUIMPU "shell" while offering new choices. These AP's are TSNTMMPU, TSSERMPU, TST12MPU, TSSUIMPU, and TSGDMMPU. Their user menus are shown in Figures 5-3 through 5-8.

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Fifteen additional test AP's have been written to support the choices offered in the test drivers. All of the choices are described in detail in the next section.

```
$ RUN TSNTMMPU
ENTER USER NAME-MAXIMUM OF 8 CHARACTERS.
CROSS
ENTER ROLE NAME-MAXIMUM OF 10 CHARACTERS.
TESTER
(Date and Time of Logon)
  1          CHG ROLE
  2          TEST INIQ
  3          TEST NI
  4          TEST TO
  5          BAD INIT
  6          FILL MBX
  7          WTHST
  8          QUIT
ENTER CHOICE NUMBER.
```

Figure 5-3. TSNTMMPU Menu

```
$RUN TSSERMPU
ENTER USER NAME-MAXIMUM OF 8 CHARACTERS.
CROSS
ENTER ROLE NAME-MAXIMUM OF 10 CHARACTERS.
TESTER
(Date and Time of Logon)
  1          INV DEST
  2          OFF APCQ
  3          CHECK HOT
  4          FILL LOG
  5          STUFF MBX
  6          HOT MBX
  7          QUIT
ENTER CHOICE NUMBER.
```

Figure 5-4. TSSERMPU Menu

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```
$ RUN TST12MPU
ENTER USER NAME-MAXIMUM OF 8 CHARACTERS.
CROSS
ENTER ROLE NAME-MAXIMUM OF 10 CHARACTERS.
TESTER
(Date and Time of Logon)
      1      NO MAILBOX
      2      FILL CORE
      3      PAIR INIT
      4      LONG INIT
      5      RUN QUEUE
      6      QUIT
ENTER CHOICE NUMBER.
6
THE TEST APPLICATION PROCESSES PORTION OF THE DEMO
IS COMPLETE
```

Figure 5-5. TST12MPU Menu

```
$RUN TSSUIMPU
ENTER USER NAME-MAXIMUM OF 8 CHARACTERS.
CROSS
ENTER ROLE NAME-MAXIMUM OF 10 CHARACTERS.
TESTER
(Date and Time of Logon)
```

Figure 5-6. TSSIG Menu

This is a test of the Sigerr and TSTMOD services. This test invokes a test AP that will generate a requested number of messages. It will alternate between regular messages and error messages of different severity levels. [Note: The logic as described here works but does not necessarily represent the full test mode logic which was only partially designed and implemented in Release 2.0.]

On Choice 1 you should receive the indicated number of regular messages with error messages of alternating severity level.

On Choice 2, you should receive the indicated number of regular messages. No error messages. Informatory (severity: I) messages will also be displayed.

On Choice 3, you should receive the regular messages and error messages of only F severity level and informatory (I) messages.

To check the messages that are being sent against those received, enable the Sigerr messages at the operator's console (SE). With Sigerr enabled, all SE messages will be displayed at the operator's console.

1. Set TESTMODE for all messages and test
2. Disable testmode for no error messages and test
3. Set testmode for fatal error only and test
4. Quit.

Figure 5-7. TSSUIMPU Menu

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\$Run TSGDMMPU  
ENTER USER NAME-MAXIMUM OF 8 CHARACTERS.  
CROSS  
ENTER ROLE NAME-MAXIMUM OF 10 CHARACTERS.  
TESTER.

This is a test of the guaranteed delivery service. This test invokes a test AP that will generate a guaranteed delivery request message for an AP that will process this request.

NOTE: No formal menu will appear. If the GDSEND test works, the test screen will display.

GD MESSAGE IS ON ITS WAY

GD AP HAS COMPLETED

The test application processes portion of the Demo is complete

Figure 5-8. TSGDMMPU Menu.



### 5.2.3 Test Descriptions

The tests needed to exercise the NTM code are defined below as to name, configuration, description, purpose, and AP Interface services tested. The overall test configuration is shown in Figure 5-9.

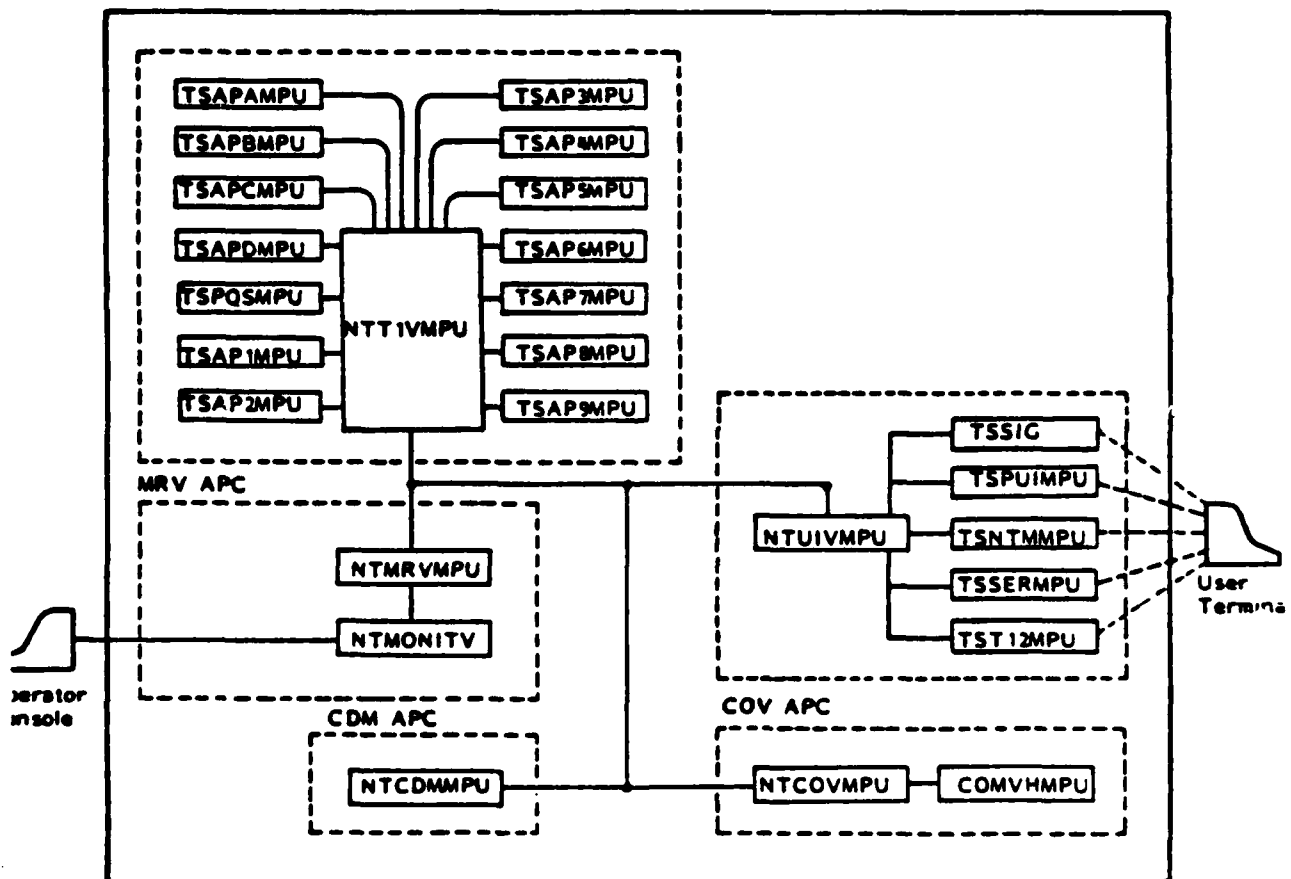
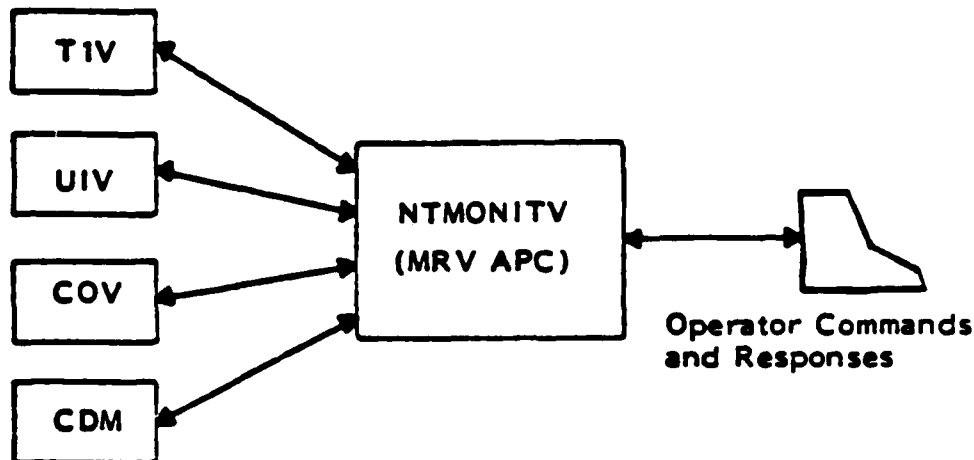


Figure 5-9. NTM Test Configuration

**Test Name:** Operator Commands

**Test Configuration:**



**Test Description:**

While there are no active AP's, the operator enters each available command in random order. After commands altering the system state (Shutdown APC and Shutdown Link) the display system status command is used to verify the results.

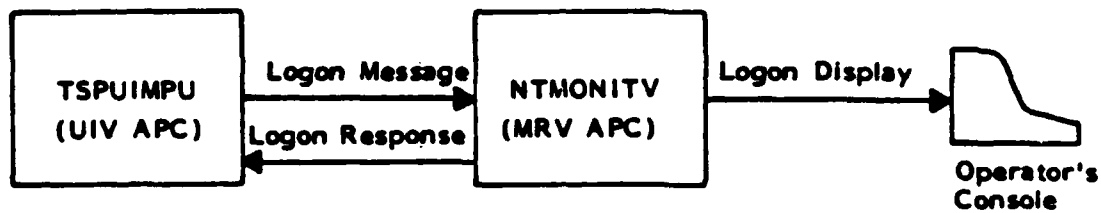
**Test Purpose:**

1. Monitor AP System Command Processing.
2. MPU System Command processing.

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Test Name: Run TSPUIMPU

Test Configuration:



Test Description:

TSPUIMPU connects to the NTM from an external terminal. A logon message is sent to Monitor AP.

Test Purpose:

1. Connect to NTM from external terminal.
2. Send a message from an AP to the Monitor AP.
3. Display Logon data to the operator.
4. Logon table.

Services Tested:

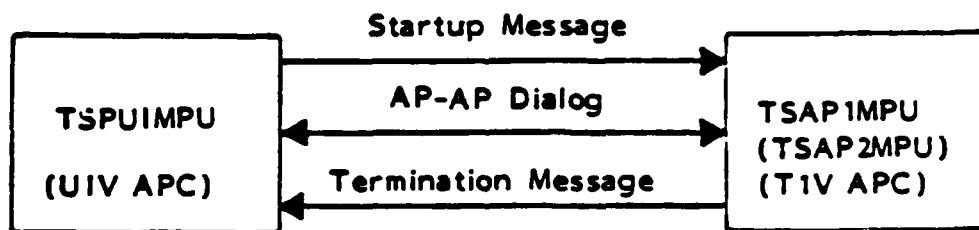
INITEX  
LOGON

System Dependent Code Tested:

SYSSASCTIM

Test Name: TSPUIMPU - Choice 1 or 2 ("Run AP1" and "Run AP2")/TSPUIMPU-Choice-8(loop-1)

Test Configuration:



Test Description:

TSPUIMPU starts TSAP1MPU/TSAP2MPU with a category "B" message (reply required). TSAP1MPU/TSAP2MPU respond and engage in a limited dialog with TSPUIMPU. At the end of the dialog TSAP1MPU/TSAP2MPU terminate normally while TSPUIMPU waits for the message telling it that a child AP has ended execution. Choice-8 will run this test in a continuous loop 50 times.

Test Purpose:

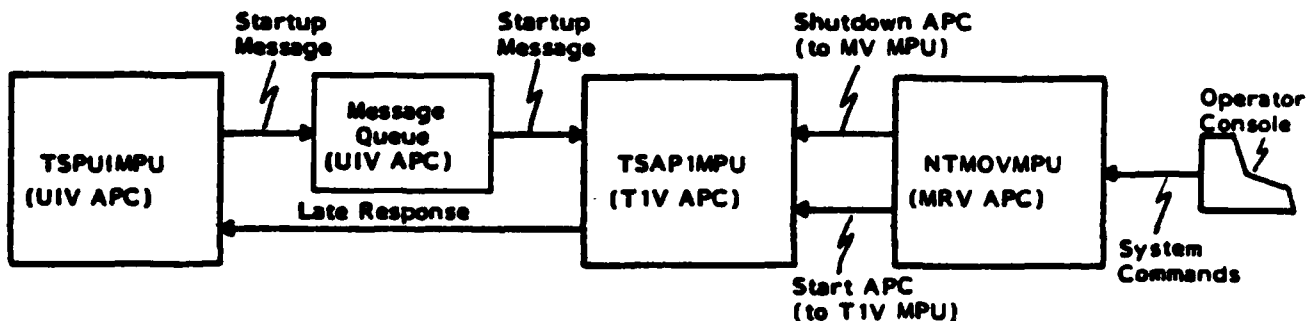
1. Child AP Initiation.
2. AP to AP communication.
3. Send message off-cluster.
4. Receive message from off-cluster.
5. Send Child Termination Message to Parent AP.
6. Cleanup upon Child Termination.
7. Send Unsolicited Initiation Accept.
8. Log Message.
9. Message Pair Table.
10. Choice-8 tests the NTM's endurance and table handling.

Services Tested:

INITAL  
NSEND  
RCV  
TRMNAT

**Test Name:** Late Response on Message Pair (using TSPUIMPU Choice-1)

**Test Configuration:**



**Test Description:**

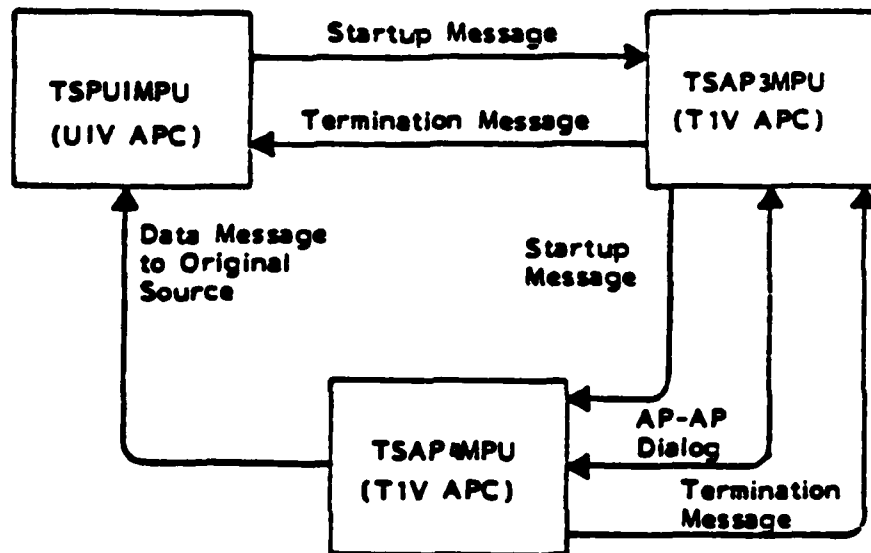
Before the user at TSPUIMPU enters a choice, TIV APC is shutdown. Then the user enters Choice 1. TIV APC is then started but, in the interim the message to TSAPIMPU has timed out. TSAPIMPU will respond anyway. When the response gets back to UIV it will not be delivered due to the timeout.

**Test Purpose:**

1. Message Pair Timeout.
2. Late response to a timed out message.

**Test Name:** TSPUIMPU - Choice 3 ("Run AP3")/TSPUIKMPU-Choice-7 (Loop-3)

**Test Configuration:**



**Test Description:**

TSPUIMPU starts TSAP3MPU with a specific initiation message. TSAP3MPU then starts TSAP4MPU. TSAP3MPU and TSAP4MPU engage in a limited dialog. At the end of the dialog TSAP3MPU terminates while TSAP4MPU continues execution. TSAP4MPU finds the original source AP (TSPUIMPU) and sends it a final status message. TSAP4MPU then terminates. Choice-7 will run this test in a continuous loop 50 times.

**Test Purpose:**

1. Send message on-cluster.
2. Immediate Parent dies before child.
3. Initiate AP on category "H" message.
4. Cleanup when all child (and grandchild) AP's are terminated.
5. Grandchild AP sends message to Original Source AP.
6. In choice-7 tests endurance of the NTH and Instance rollover after the 99th instance.

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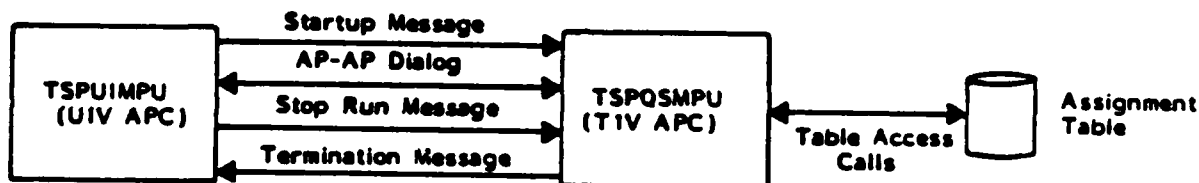
**Services Tested:**

ISEND  
GETUSR  
CHKMSG (Cold Mailbox - Any Match)

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**Test Name:** TSPUIMPU - Choice 4 ("Run TSPQS")

**Test Configuration:**



**Test Description:**

TSPUIMPU starts TSPQSMPU (Pseudo Queue-Server) and displays a menu of Machinist Numbers and Machinist Names to the user. The user enters one number at a time to get the group assignment of the machinist. The Queue-Server will check the Assignment Table and return the correct group assignment number. This test will run until the user enters "99" to specifically end the session.

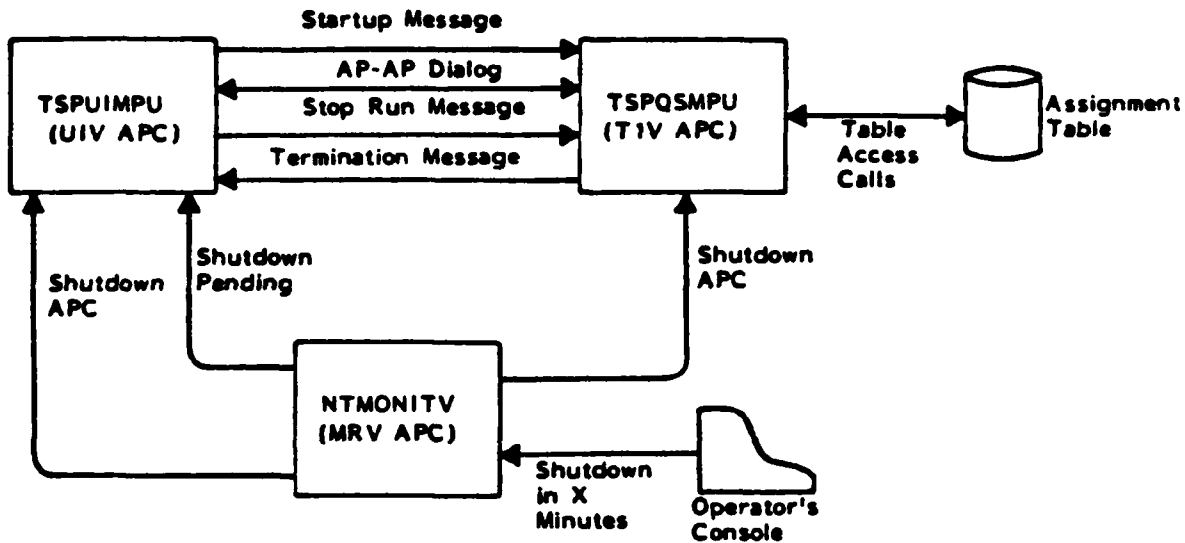
**Test Purpose:**

1. Queue Server Logic



Test Name: Shutdown Pending/Shutdown IISS (using TSPUIMPU - Choice 4)

Test Configuration:



Test Description:

While running Choice 4, the operator enters the shutdown pending command. At the end of the allotted time, the shutdown IISS command will be sent to the active APC's. The user on TSPUIMPU will have sufficient time to end the session and exit gracefully. Or, the user can continue the session until TSPUIMPU shuts itself down.

Test Purpose:

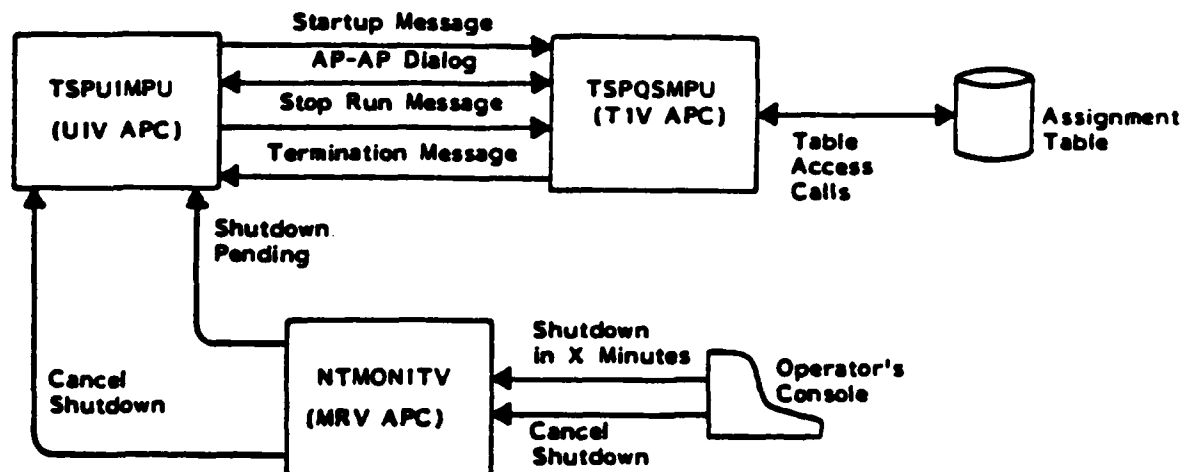
1. Monitor and MPU Shutdown Pending Logic.
2. Shutdown with Active AP's.
3. Soft shutdown of AP having shutdown logic.
4. Monitor and MPU shutdown IISS logic

Services Tested:

CHKMSG (Hot Mailbox - NTM Requests)

**Test Name:** Shutdown Pending/Cancel Shutdown (using TSPUIMPU - Choice 4)

**Test Configuration:**



**Test Description:**

The same as Shutdown Pending/Shutdown IISS except that the operator enters the cancel shutdown command before IISS shutdown begins.

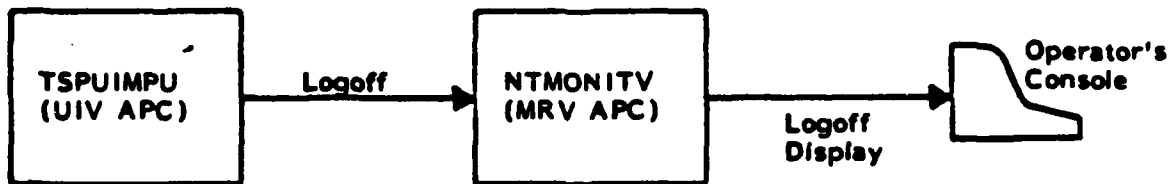
**Test Purpose:**

1. Monitor AP and MPU cancel shutdown logic.
2. Cancel shutdown message to the UI.

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Test Name: TSPUIMPU - Choice 6 (Quit)

Test Configuration:



Test Description:

TSPUIMPU informs Monitor AP that the user has logged off.  
It then disconnects from the NTM.

Test Purpose:

1. Disconnect from the NTM.
2. Logoff Message Logic.
3. Logon Table.
4. Display Logoff information to the Operator.

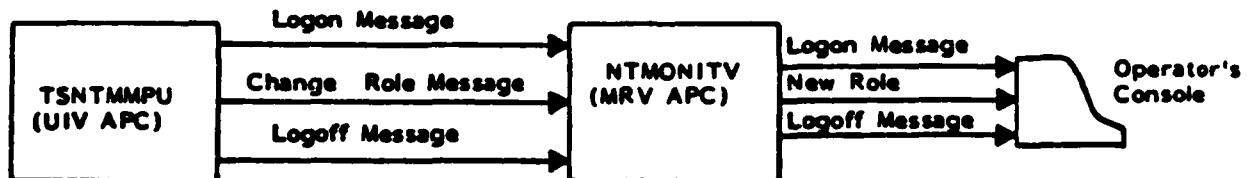
Services Tested:

TRMNAT  
LOGOFF

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**Test Name:** TSNTMMPU - Choice 1 (Change Role)

**Test Configuration:**



**Test Description:**

The user logged on at TSNTMMPU is allowed to change the role specified at Logon. The new role is entered and passed to the Monitor AP. The user then logs off using the new role.

**Test Purpose:**

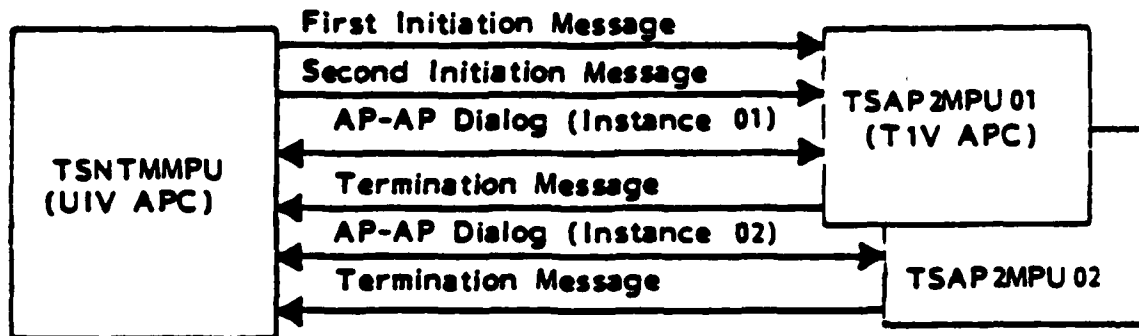
1. Monitor AP's Change Role Logic.
2. Logon Table updates.

**Services Tested:**

CHGROL

Test Name: TSNTMMPU - Choice 2 (Test Initiation Queues)

Test Configuration:



Test Description:

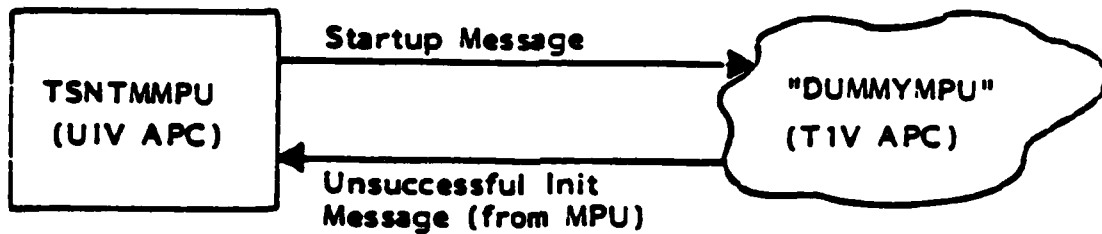
TSNTMMPU sends two specific initiation messages to TSAP2MPU. AS TSAP2MPU is allowed only one active instance at a time, the second initiation message is queued. When the first instance terminates, the second instance is started.

Test Purpose:

1. Initiation Message Queue.
2. AP Characteristic of single instance.
3. Start second instance.
4. MPU Time Check Logic

**Test Name:** TSNTMMPU - Choice 3 (Test Unsuccessful Initiation)

**Test Configuration:**



**Test Description:**

TSNTMMPU attempts to start "DUMMYMPU" on a specific initiation message. "DUMMYMPU" is listed in all the right tables but does not in fact exist. Upon the attempt to start it, the MPU will detect that it is not alive and return an Unsuccessful Initiation Message to the source AP.

**Test Purpose:**

1. Unsuccessful Initiation.
2. MPU I'm Alive Table Checker.
3. Child Table Logic.

Test Name: TSNTMMPU - Choice 4 (Test Timeout)

Test Configuration:



Test Description:

TSNTMMPU attempts to start "DUMMYMPU" on a paired message (non-specific initiation). The startup message will timeout and the UIV MPU will return a timeout expired message.

Test Purpose:

1. Message Pair Table
2. Pair Timeout Checker
3. Timeout Expired Message

Services Tested:

RCV (Timeout-Expired)

**Test Name:** TSNTMMPU - Choice 5 (Bad Initiation)

**Test Configuration:**



**Test Description:**

TSNTMMPU attempts to start TSAP3MPU on a non-specific initiation message (in this case, category "E"). TSAP3MPU, however, has the characteristic of requiring a specific initiation message. An error message will be displayed at the operator's console. The source AP will also be informed of the error condition.

**Test Purpose:**

1. MPU Logic for "restricted" AP's.

**Services Tested**

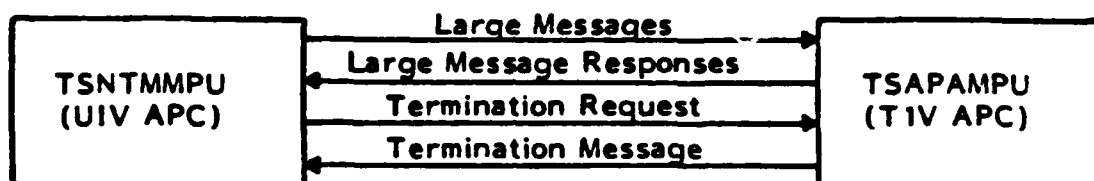
TSTMOD

SIGERR



Test Name: TSNTMMPU - Choice 6 (Fill Mailbox)

Test Configuration:



Test Description:

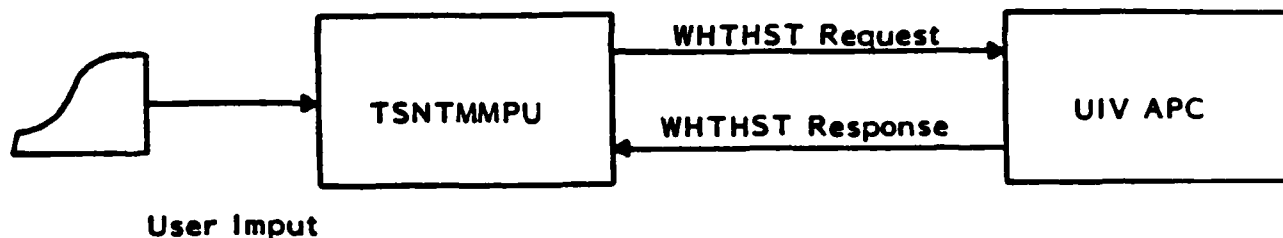
TSNTMMPU sends three messages that (a) contain the maximum number of bytes for a single message and (b) are sequentially numbered. TSAPAMPU will receive the messages and respond to each with a message containing the number of the received message. TSAPAMPU will terminate upon receipt of a termination request from TSNTMMPU.

Test Purpose:

1. Serial message queues.

**Test Name:** TSNTMMPU - Choice 7 (WTHST)

**Test Configuration:**



**Test Description:**

TSNTMMPU requests an AP name (with directory prefix) from the user. TSNTMMPU will then call "WTHST" with the given AP name. The WTHST return will be displayed to the user.

**Test Purpose:**

1. WTHST Service.

**Test Name:** TSSERMPU-Choice-1 (Invalid Destination)

**Test Configuration:**



**Test Description:**

TSSERMPU sends a message to "JUNKMPU" which has neither existence or records in the tables. The AP will receive the "SEND-INVALID-DESTINATION" return on the "NSEND" call. An error message will also be sent to the monitor AP. (The error message will be displayed on the operator's console as "31024-ACT" entry not found in Authority Check Table).

**Test Purpose:**

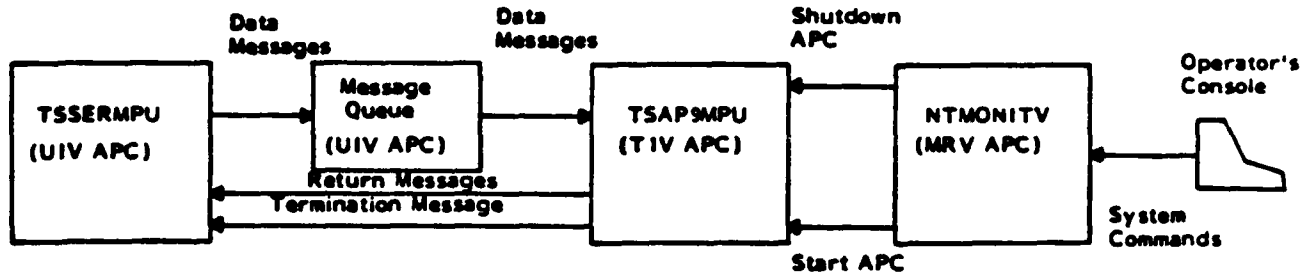
1. MPU message management logic.
2. Send returns.

**Service Tested:**

NSEND (SEND-INVALID-DESTINATION)

**Test Name:** TSSERMPU-Choice-2 (Off APC Queue)

**Test Configuration:**

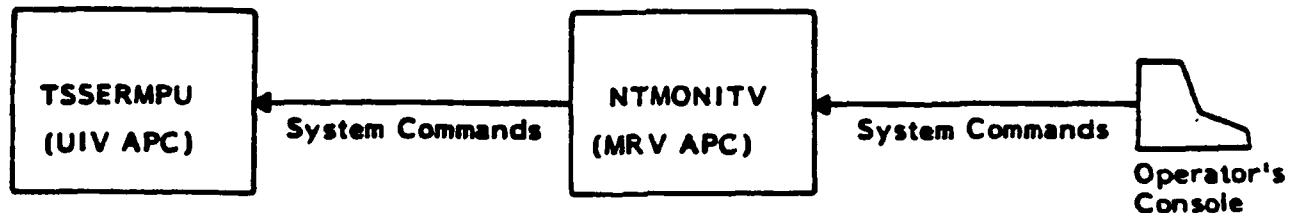


**Test Description:**

This is no longer a valid test because a change in the NTM logic in Rel. 1.1 now forces messages for an off-APC that is currently not available to be rejected rather than queued for later delivery (only guaranteed delivery messages will be queued for later APC delivery.) A "Resource Unavailable" message is sent to APs who are set to receive asynchronous status messages from the NTM on the event of an unavailable APC on a message delivery request. The test can be run without shutting TIV down but it does not test anything new. The test AP TSSERMPU, is not written to accept or display the Resource Unavailable message.

**Test Name:** TSSERMPU-Choice-3 (Check Hot Messages)

**Test Configuration:**



**Test Description:**

Choice-4 enters a loop that repeatedly checks the hot mailbox for a message. If a hot message is found, the type is interpreted and an appropriate display is shown. The test operator should enter an "SD" Command at the operator's console after starting this test and respond with a time greater than zero on the "minutes to shutdown?" request. The test AP TSSERMPU should receive the shutdown pending message and terminate. The IISS shutdown should proceed.

**Test Purpose:**

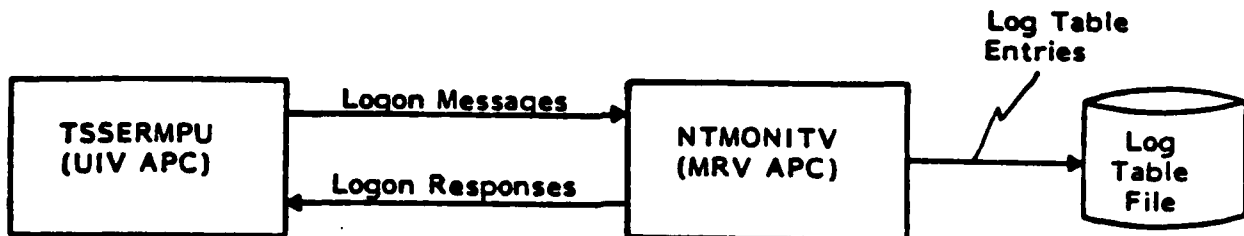
1. MPU Shutdown Pending Logic
2. MPU Shutdown where an AP has it's own Shutdown Logic.
3. Cancel Shutdown Logic.

**Service Tested**

CHKMSG  
RCV

**Test Name:** TSSERMPU-Choice-4 (Fill Log)

**Test Configuration:**



**Test Description:**

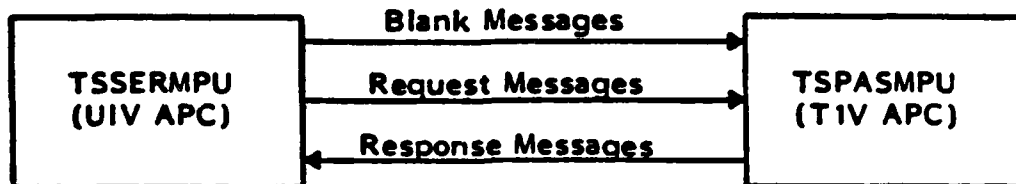
TSSERMPU calls "LOGON" 15 times. As the logon table has an occurs of 10, at least five of the entries will have to be written to a file. After the entries are written they will be deleted via 15 calls to "LOGOFF".

**Test Purpose:**

1. Table File Access on Write and Delete Functions.

Test Name: TSSERMPU-Choice-5 (Stuff Mailbox)

Test Configuration:



Test Description:

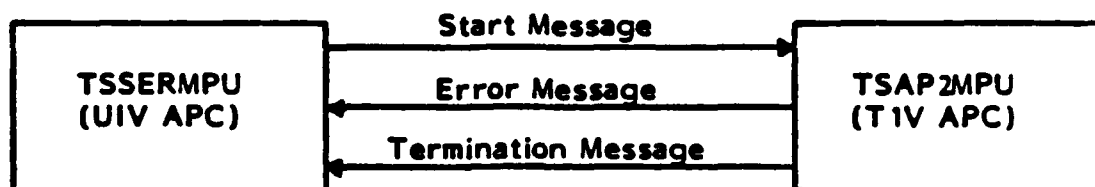
TSSERMPU sends 80 messages to TSPQSMPU (Queue Server) before calling RCV. As TSPQSMPU will be responding to the 40 request messages long before TSSERMPU calls RCV, the response messages will have to be queued at UIV APC. Noticable delays in the display of the messages sent and received will occur during the processing of this test. This is because of the timer delays that occur before the queued messages are processed.

Test Purpose:

1. AP Queue Handling.
2. Buffer Capacity.

**Test Name:** TSSERMPU-Choice-6 (Hot Mailbox)

**Test Configuration:**



**Test Description:**

TSSERMPU sends a message to TSAP2MPU that will cause TSAP2MPU to call RCV for a "hot" message. As TSAP2MPU does not support a "hot" mailbox, it will receive an error return. This return will be sent to TSSERMPU in a message from TSAP2MPU. TSAP2MPU will then terminate itself.

**Test Purpose:**

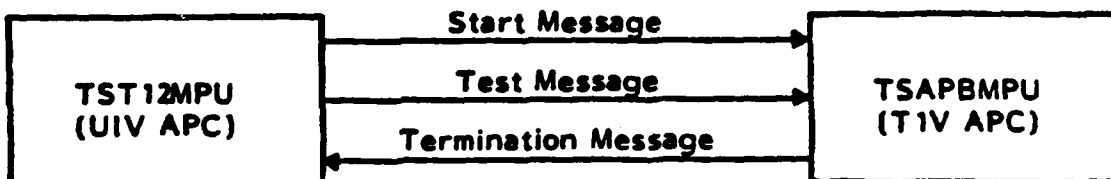
1. AP Characteristic of Number of Mailboxes Supported.
2. RCV handling of an invalid call.



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**Test Name:** TST12MPU-Choice-1 (No Mailbox)

**Test Configuration:**



**Test Description:**

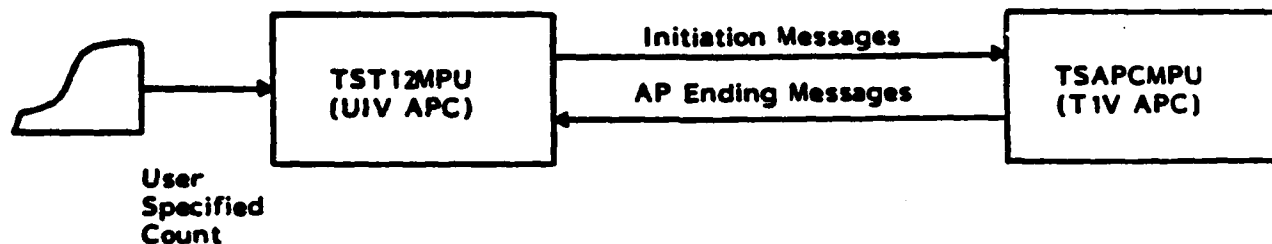
TST12MPU starts TSAPBMPU. TSAPBMPU has the characteristic of having no mailboxes. When TST12MPU sends a message to TSAPBMPU, an error message will come back. TSAPBMPU will terminate itself.

**Test Purpose:**

1. "No Mailbox" logic in INITAL, RCV, and MPU.

**Test Name:** TST12MPU-Choice-2 (Fill Core)

**Test Configuration:**



**Test Description:**

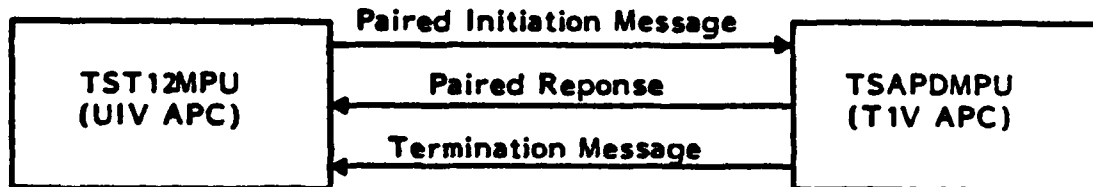
TST12MPU sends a series of specific initiation messages to TSAPCMPU in order to fill the in-core dynamic tables. TSAPCMPU will start, call RCV, and terminate. TST12MPU will receive AP Ending messages equal to the number of initiation messages sent.

**Test Purpose:**

1. Fill in-core tables in order to test table handling when writing to a file.

**Test Name:** TST12MPU-Choice-3 (Paired Initiation)

**Test Configuration:**



**Test Description:**

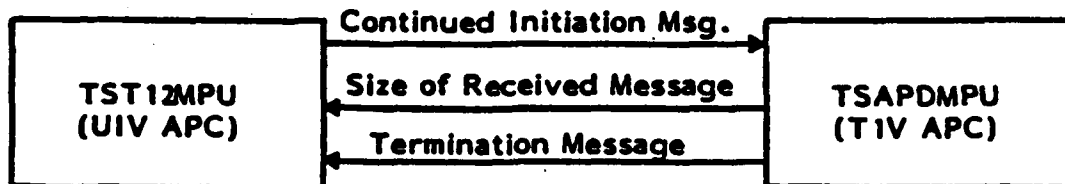
TST12MPU sends a paired initiation message to TSAPDMPU. A new instance of TSAPDMPU will be started and it will respond to the message. TSAPDMPU will then terminate itself.

**Test Purpose:**

1. ISEND logic for sending paired messages.
2. MPU logic to handle category "J" messages.

**Test Name:** TST12MPU-Choice-4 (Long Initiation)

**Test Configuration:**



**Test Description:**

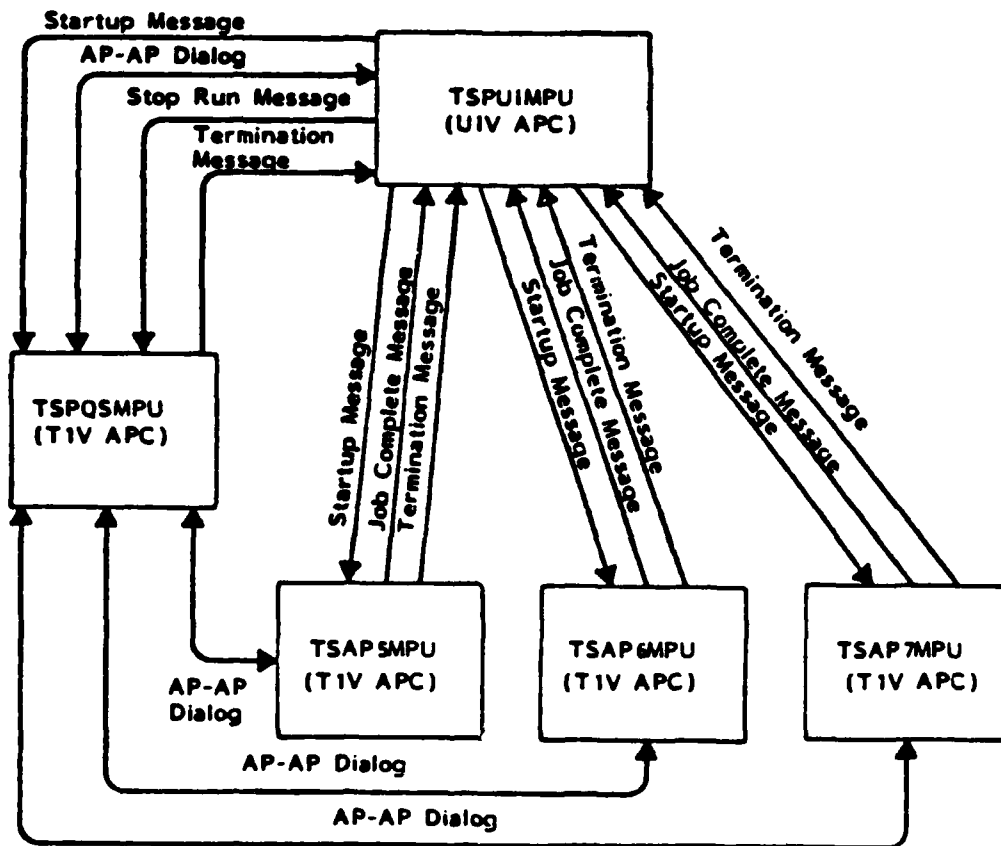
TST12MPU sends a continued initiation message to TSAPDMPU. A new instance of TSPDMPU will be started. It will call RCV and return the number of bytes of data received in a message to TST12MPU. TSAPDMPU will then terminate itself.

**Test Purpose:**

1. ISEND logic for sending continued messages.

Test Name: TST12MPU - Choice 5 (Run Queue)

Test Configuration:



Test Description:

TST12MPU starts TSAP5MPU, TSAP6MPU, and TSAP7MPU. Each AP begins sending a series of three messages to the Queue Server (TSPQSMPI). TST12MPU also sends a message, creating the situation where four AP's are communicating with the same instance of the queue server. At the end of the dialog, TSAP5MPU, TSAP6MPU, and TSAP7MPU inform TST12MPU that they are finished. When TST12MPU has heard from all the AP's it tells TSPQSMPI to shutdown.

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This test was at one time driven by TSPUIMPU. Due to the handling of a Queue Server as a "child" of the NTM, the source AP has no way of knowing when a Queue server has terminated. The source will continue to send messages to a (possibly) dead AP. This test was moved to avoid this occurrence.

**Test Purpose:**

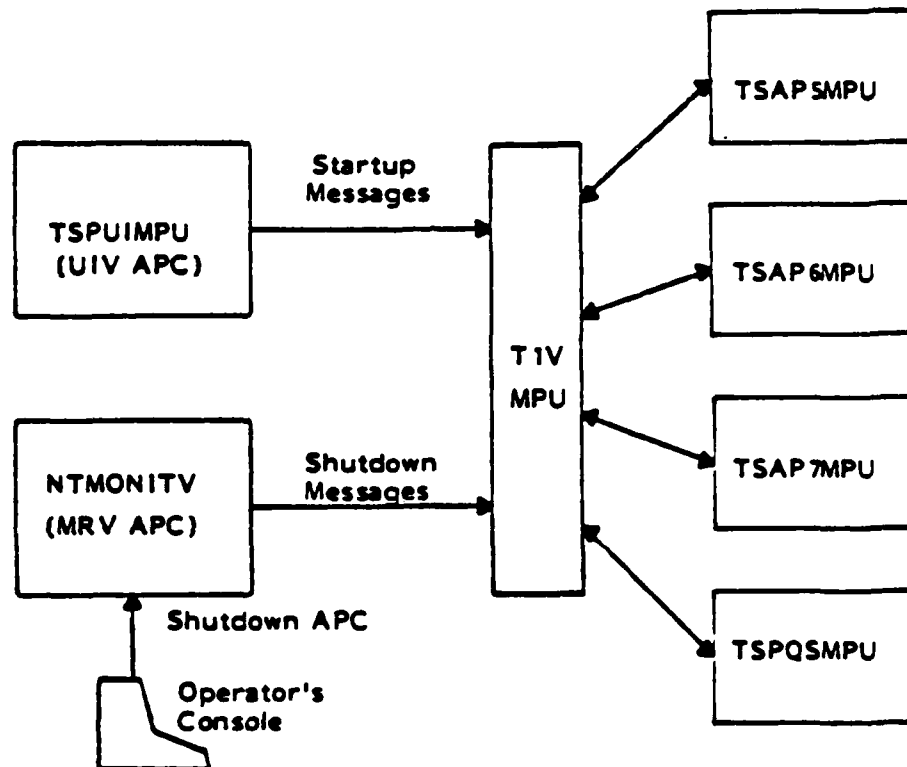
1. Multiple Parents per instance.
2. Message Queues.
3. Delivery of messages to a Queue Server Type AP.

**Services Tested:**

RCV (Message Buffer Logic)  
NSEND  
GETUSR

**Test Name:** Shutdown APC with Active AP's (using  
TST12MPU-Choice-5)

**Test Configuration:**



**Test Description:**

There are two variations on this test.

1. The user enters Choice 5 followed immediately by the Operator entering the Shutdown APC Command (T1V). In this case, some of the AP's on T1V will be in the initiation stage. A message is sent to Monitor to that effect.
2. The user enters Choice 5. The Operator waits until all the AP's are active and then enters the Shutdown APC Command. As none of the AP's have shutdown logic, they will be aborted and the APC terminated message is sent to Monitor.

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**Test Purpose:**

1. APC Shutdown Logic with AP's still in initiation phase.
2. APC Shutdown Logic with active AP's on cluster.



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NETWORK TRANSACTION. (U) GENERAL ELECTRIC CO  
SCHENECTADY NY PRODUCTION RESOURCES CONSU.

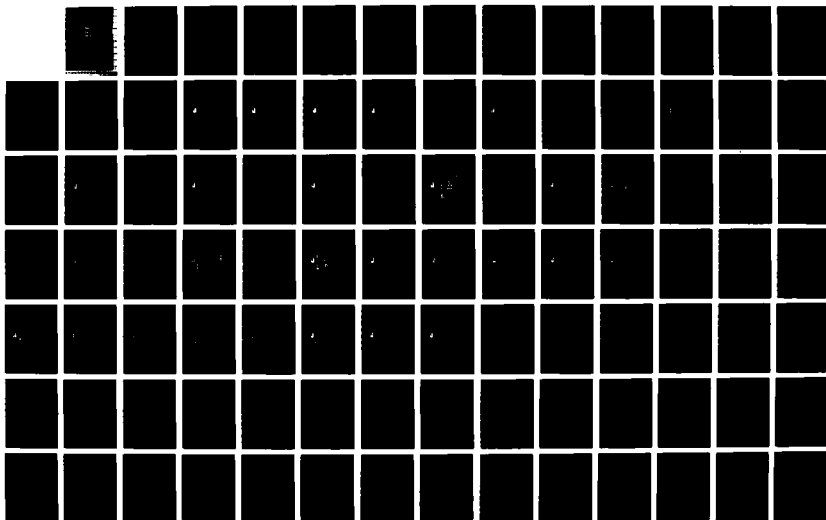
3/5

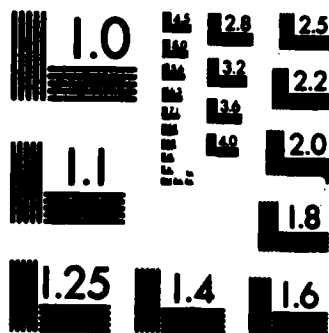
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NL

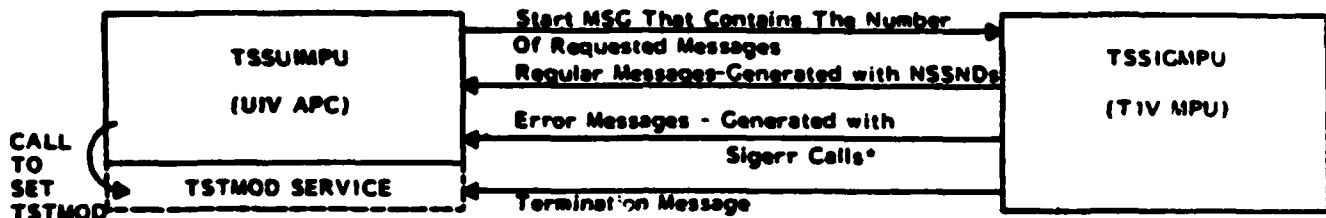




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**Test Name: TSSUIMPU - Choice 1,2,3**

**Test Configuration:**



\*Sigerr generated messages are also directed to the monitor, and can be displayed by entering "SE" at the operator's console. The default at IISS startup is for no logging of Sigerr generated messages at the operator's console.

**Test Description:**

TSSUIMPU tests the three user testmodes that are setable by calls to TSTMOD in the three TSSUIMPU test choices. On Choice 1, TSTMOD is called to request the receipt of all messages by the test program. It also requests the tester to enter a number that will tell the test program, TSSIGMPU, the number of messages to generate in this test. On its startup, TSSIGMPU in all of the choices will loop through a series of regular messages sends, then Sigerr generated messages of severity levels (I, informatory; W, warning; F, fatal). On Choice-1, the test screen should display the received list of messages and their types. This list should contain a cycle of a regular message followed by error messages of Severity I, W, and F.

On Choice 2, TSTMOD is called to request that no error messages be sent to the user Screen. Again, the tester must supply the number of messages of each class that TSSIGMPU should generate. TSSIGMPU cycles through its message series in the same manner as in Choice-1, but in this test the only messages that are displayed are the regular messages and the I (Informatory) messages generated by TSSIGMPU calls to Sigerr. A verification that TSSIGMPU is generating all classes of Sigerr messages can be made by enabling SE at the operator's console

and making sure that error messages of all types have been received at the operator's console during the test.

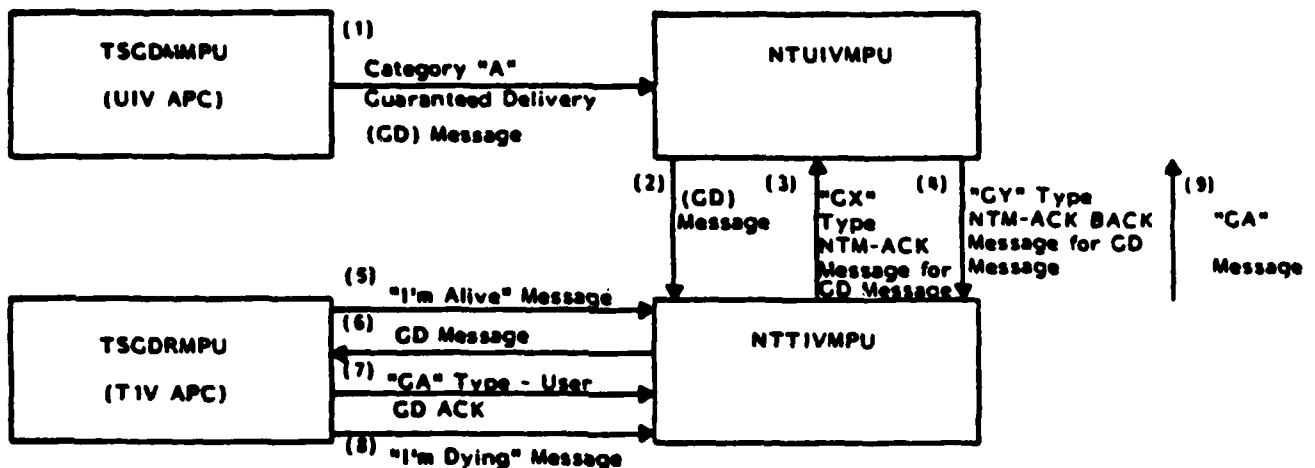
On Choice -3, TSTM0D is called to request that the only Sigerr generated error messages it should receive are the fatal (F) error messages. The test proceeds as in the other choices, but in this case only regular, Informatory (I), and fatal (F) error messages will be displayed on the test console.

**Test Purpose:**

1. TSMOD Service Test.
2. Sigerr Service Test.
3. "SE" Operator's command test
4. New RCV logic to support filtering necessary with the TSTM0D flag.

**Test Name:** TSGDMMPU -Test Guaranteed Delivery Service.

**Test Configuration:**



### Test Description:

TSGDMMPU tests the NTM's guaranteed delivery logic, and the two services, GDSSEND and GDACK. On the startup of TSGDMMPU, a guaranteed delivery (GD) message is requested with the service, GDSSEND. A message of category "A" (GD) is generated for TSGDRMPU. After it has been accepted (logged) by NTUIVMPU, a message "GD Message Accepted" should appear on the test screen. The rest of the test needs to be verified by checking the NTMLOG.

If the test worked correctly, after NTTIVMPU receives the "A" category message from TSGDMMPU, it should send an NTM-GD acknowledgment to NTUIVMPU (message type: "GX"). NTUIVMPU should then send an NTM-GD AckBack message (message type: "GY") to NTTIVMPU. On its receipt of the GD message, TSGDRMPU should send, via GDACK, a user GD acknowledgement, message type "GA", before terminating.

### Test Purpose:

1. Test GDSSEND Service.
2. Test GDACK Service.

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3. Test MPU handling of GD messages.

3.2.4 Formal Qualification Tests

Formal Qualification testing will be designed and performed by General Electric with support from SofTech.

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SECTION 6

PREPARATION FOR DELIVERY

The software associated with this NTH CPCI release will be delivered on a media which is compatible with the IISS Test Bed. The release will be clearly identified as to release, date, content, format and function and will include instructions on procedures to be followed for installation of the release.

APPENDIX A

**TERMS AND ABBREVIATIONS**

The following is a list of symbols, abbreviations, and acronyms used throughout this development specification.

LIST OF SYMBOLS, ABBREVIATIONS, ACRONYMS

|       |                                                                    |
|-------|--------------------------------------------------------------------|
| AP    | Application Process                                                |
| APC   | Application Process Cluster                                        |
| API   | Application Process Interface                                      |
| CDMRP | Common Data Model Request Processor                                |
| COMM  | Communications Handler                                             |
| CPCI  | Computer Program Configuration Item                                |
| DBMS  | Data Base Management System                                        |
| DML   | Data Manipulation Language                                         |
| ICAM  | Integrated Computer Aided Manufacturing                            |
| IDSS  | Integrated Decision Support System                                 |
| IISS  | Integrated Information Support System                              |
| IPC   | Inter Process Communication                                        |
| LAN   | Local Area Network                                                 |
| MCMM  | Manufacturing Control Material Management                          |
| MDL   | Message Definition Language                                        |
| MM    | Message Manager                                                    |
| MO    | Maintain Operability                                               |
| MPU   | Message Processing Unit                                            |
| MRP   | Materials Requirements Planning                                    |
| MSG   | Message                                                            |
| NTM   | Network Transaction Manager                                        |
| OS    | Operating System                                                   |
| PM    | Process Manager                                                    |
| QA    | Quality Assurance                                                  |
| SS    | System Specification                                               |
| UI    | User Interface                                                     |
| VAX   | Trademark of Digital Equipment Corporation: 32<br>bit minicomputer |
| VMS   | Trademark of Digital Equipment Corporation: The<br>VAX OS          |



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This paragraph contains definitions of IISS related terms and general computer terms that are used in this document. In addition, it contains definitions for selected terms used in the IDEFO Model (Appendix B) and serves in lieu of a formal model glossary.

|                             |                                                                                                                                                                                                                                                                                           |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AP                          | See Application Process.                                                                                                                                                                                                                                                                  |
| Abnormal                    | Stoppage of a process prior to its normal completion.                                                                                                                                                                                                                                     |
| Termination                 | (Abort)                                                                                                                                                                                                                                                                                   |
| Alive AP                    | An application process that is capable of being initiated.                                                                                                                                                                                                                                |
| Application Process         | Within the IISS Architecture; a cohesive unit of software that can be initiated as a unit to perform some function or functions. See also: Process.                                                                                                                                       |
| Application Process Cluster | A logically related group of application processes that resides on a single host system. The application processes are collected at a single cluster because of their common need to access the same database. (In previous NTM documents this concept was referred to as "Workstation"). |
| Authorization               | A relationship between message type and legal paths of messages conforming to that type.                                                                                                                                                                                                  |
| Awake AP                    | An application process that is currently executing.                                                                                                                                                                                                                                       |

|                                     |                                                                                                                                                                                        |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Backlog                             | Messages waiting, in a queue, to be processed.                                                                                                                                         |
| CDMRP                               | See Common Data Model Request Processor.                                                                                                                                               |
| COMM                                | See Communications Handler.                                                                                                                                                            |
| CPCI                                | Computer Program Configuration Item. A cohesive testable (stand-alone) system with well-defined external interfaces.                                                                   |
| Clean Point                         | A baseline of the entire system state at a given point in time so that recovery is possible from that point.                                                                           |
| Cluster                             | See Application Process Cluster.                                                                                                                                                       |
| Common Data                         | Information that may be shared among users and is subject to policies and procedures of the IISS.                                                                                      |
| Common Data Model (CDM)             | A description of the data, its structure, allowable operations, and integrity constraints for data of common interest within the IISS.                                                 |
| Common Data Model Request Processor | The implementation of the CDM within the IISS. The current design specifies the use of extremities.                                                                                    |
| Communications Handler              | An IISS Configuration Item that services IISS network communications. It accepts messages from the NTM for off-host destinations. It provides NTM with messages from off-host sources. |
| DBMS                                | See Data Base Management System.                                                                                                                                                       |
| DML                                 | See Data Manipulation Language.                                                                                                                                                        |
| Database                            | A collection of logically related data managed by a DBMS.                                                                                                                              |
| Data Base Management System         | A computerized system consisting of numerous components, which have as their collective purpose the implementation, management, and protection of large-scale                          |

|                                   |                                                                                                                                  |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|                                   | data bases.                                                                                                                      |
| <b>Data Manipulation Language</b> | A formal language for specifying data modification, and retrieval functions under a DBMS.                                        |
| <b>Destination</b>                | An application process (which may be user role) to which a message is sent.                                                      |
| <b>Heterogeneous</b>              | Composed of parts of different kinds; having widely dissimilar elements or constituents.                                         |
| <b>Homogeneous</b>                | Composed of parts all of the same kind.                                                                                          |
| <b>Host</b>                       | See Host Machine.                                                                                                                |
| <b>Host Machine</b>               | A configuration of a processor(s) and associated peripherals.                                                                    |
| <b>IISS Component</b>             | Application Processes involved in IISS support activities. See: CDMRP, UI, COMM.                                                 |
| <b>IISS Operation</b>             | Messages entered directly to the NTM by an operator.                                                                             |
| <b>Messages</b>                   | These include: startup, shutdown, restart, and provide status and statistics.                                                    |
| <b>IISS Shutdown</b>              | A signal or IISS operator command that initiates the orderly shutdown of the entire IISS system or an individual workstation.    |
| <b>IISS Startup</b>               | A signal or IISS operator command that initiates the IISS on a single host.                                                      |
| <b>Integrated AP</b>              | An application process designed and written in accordance with the IISS Integration rules.                                       |
| <b>Initiation Message</b>         | A message that specifically requires the initiation of an application process. The message may also carry data for that process. |
| <b>LAN</b>                        | Local Area Network.                                                                                                              |

|                                  |                                                                                                                                                                                                                        |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Load</b>                      | To bring a bound (linked) set of computer instructions into a computer memory unit in preparation for its execution as a process.                                                                                      |
| <b>MDL</b>                       | Message Definition Language. Neutral syntax and semantics for formatting IISS messages.                                                                                                                                |
| <b>MM</b>                        | See Message Manager.                                                                                                                                                                                                   |
| <b>Maintain</b>                  | The name given to that part of the NTM that will                                                                                                                                                                       |
| <b>Operability</b>               | Facilitate system wide services of restart, recovery, shutdown, and system status monitoring and recording.                                                                                                            |
| <b>Message</b>                   | A structured unit of information.                                                                                                                                                                                      |
| <b>Message and Error Log</b>     | The record of messages (legal and erroneous) that are processed by the message manager.                                                                                                                                |
| <b>Message Category</b>          | A group of message types sharing common processing requirements.                                                                                                                                                       |
| <b>Messages from Off-Cluster</b> | Any message that has as its source an AP or NTM that is not resident on the cluster in question.                                                                                                                       |
| <b>Message from On-Cluster</b>   | Any message sent by a local AP that is directed to another on APC AP or to another NTM (i.e., requiring the routing services of the Message Manager).                                                                  |
| <b>Message, Definition</b>       | The legal (recognized and allowed) values to which a message must conform to be accepted for processing at an AP on a given APC on a given host. The values are contained in tables which are defined in Section 3.5.3 |
| <b>Message Manager</b>           | The name given to the part of the NTM that will provide the service for the identified Manage Message functions (see DS/A1 Section 10.2).                                                                              |

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|                             |                                                                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Message to IISS Operator    | Typically a response to an operation request. This message could also be a request for operator action.                                          |
| Messages to Off-Cluster     | Any message that has as its source an AP or NTM that is not resident on the cluster in question.                                                 |
| Message to On-Cluster       | Messages directed to an AP (resident on the cluster) that contain information necessary for the process to perform.                              |
| Message to be Routed        | A message that has another AP as its destination.                                                                                                |
| Message Type                | The identification of the nature of a given message.                                                                                             |
| MO                          | See Maintain Operability.                                                                                                                        |
| MO Data and Status Messages | Any message directed to the maintain operability function.                                                                                       |
| Native Mode                 | Character code native to a particular machine, either ASCII or EBCDIC.                                                                           |
| Network                     | Several computers and a communications facility connecting them.                                                                                 |
| Non-integrated AP           | An Application Process designed without adherence to the IISS Integration rules.                                                                 |
| NTM                         | Network Transaction Manager. That portion of the IISS that manages messages and application processes and maintains the operability of the IISS. |
| OS                          | See Operating System.                                                                                                                            |
| OS Process Control Response | Response from the host operating system to a request for services, (i.e., process ID assigned, process exists, process does not exist).          |
| OS Process Control Request  | Request for services to be provided by the host operating system.                                                                                |

|                                  |                                                                                                                                                                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>On-APC AP Messages</b>        | Any message that has as its destination an AP that is resident on the workstation in question.                                                                                                                                   |
| <b>Operability Messages</b>      | Messages initiated by maintain operability to handle an IISS operation request and to monitor the IISS system.                                                                                                                   |
| <b>Operating System</b>          | Software that controls the execution of computer programs and that may provide scheduling, debugging, input-output control, accounting, compilation, storage assignment, data management, and related overall system management. |
| <b>Priority</b>                  | The expectation of processing urgency assigned to a message type. The recognized transaction priorities are: standard, immediate and time-triggered.                                                                             |
| <b>Process</b>                   | The basic unit of work from the standpoint of the computer's operating system.                                                                                                                                                   |
| <b>Process Manager</b>           | The name given to the part of the NTM that will provide the service for the identified Manage Processes function. (See DS/A2, Section 10.2)                                                                                      |
| <b>Process Name</b>              | The AP Name and instance identifier of an initiated AP.                                                                                                                                                                          |
| <b>Requirement</b>               | Stated functions for information processing and associated constraints.                                                                                                                                                          |
| <b>Resources</b>                 | People, hardware, software, and other components used to process information.                                                                                                                                                    |
| <b>Source</b>                    | An Application Process from which a message is sent.                                                                                                                                                                             |
| <b>Status and Statistics Log</b> | Data regarding the AP status, resource utilization, message traffic provided in response to an operation request.                                                                                                                |
| <b>System</b>                    | A collection of people, hardware, software and methods organized to accomplish a set of specific functions.                                                                                                                      |

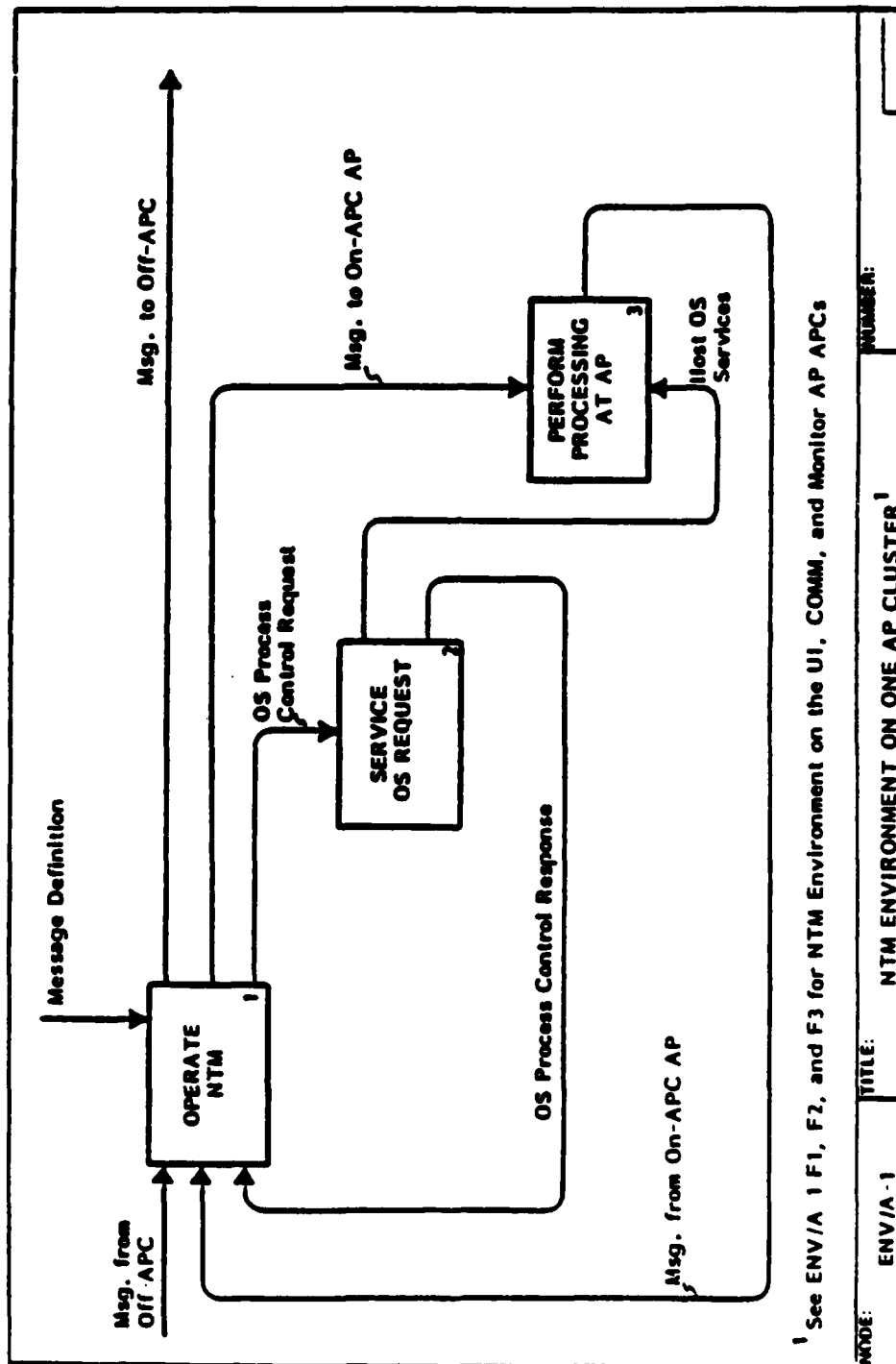
|                                 |                                                                                                                                                                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Task</b>                     | <b>See Process.</b>                                                                                                                                                                                                                 |
| <b>Test Bed</b>                 | A collection of computer hardware, software, storage devices, and other peripherals used for testing application software and system concepts. Usually not the target operational system.                                           |
| <b>UI</b>                       | <b>See User Interface.</b>                                                                                                                                                                                                          |
| <b>Update</b>                   | The process of changing values in all or selected entries, groups, or data items stored in a database or adding or deleting data occurrences.                                                                                       |
| <b>User</b>                     | Human being who requests processing to be done. The person entering a transaction at a terminal. The user can also be a non-human that performs these functions but this term will not be used in this sense in this specification. |
| <b>User Application Process</b> | Any application process not involved in IISS support                                                                                                                                                                                |
| <b>User Interface</b>           | An application process that manages the user-terminal interface.                                                                                                                                                                    |
| <b>View</b>                     | That which is within the range of vision. Also, that data which is of interest to a specific application process.                                                                                                                   |
| <b>Workstation</b>              | <b>See Application Process Cluster</b>                                                                                                                                                                                              |

APPENDIX B

B.1 IDEFO Model of the NTM

The model presented here represents conceptual view of the IISS and the workstation environment in which the NTM will operate (ENV/A-1) along with the functional breakdown of the NTM components. The description of the functional processing shown in the model is found in Section 4.2 and serves in lieu of text.





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| USED AT:                    | AUTHOR: Softech | DATE: 9/17/82 | WORKING | READER | DATE | CONTENT: |
|                             | PROJECT: NTM    | REV:          | DRAFT   |        |      |          |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                 |               |         |        |      |          |

The basis of the IISS architecture is the concept of AP clusters. An AP cluster is defined as a highly cohesive group (one or more) of Application Processes that have either one or no Database Manager (and by extension, database) in common. This concept allows for the isolation of application functions based upon the data they need to access. The IISS components, the User Interface (UI), Communications Handler (CTMH), and Common Data Model Request Processor (CDMRP) are seen as Application Processes that each reside on a distinct AP cluster. Non-Integrated or "Existing" Applications (applications designed without adherence to IISS integration rules) also reside on separate AP clusters in accordance with the rule that they access one database. Integrated or "New" Applications (applications designed and written in accordance with the IISS Integration Rules) will either reside on separate AP clusters or be added to existing AP clusters depending upon database(s) they need to access.

An Application Process (AP) within the IISS architecture is a cohesive unit of software that can be initiated as a unit to perform some function or functions. All APs within the IISS are treated in the same manner by the NTM.

Some examples of APs in the IISS are; User Application Processes such as an MCM component capable of processing a transaction; and IISS components such as the User Interface, Communication Handler, and Common Data Model Request Processor. The NTM's concern in all cases is to provide a transparent logical link from

|                 |                               |         |
|-----------------|-------------------------------|---------|
| MODE: ENV/A-111 | TITLE: NTM ENVIRONMENT - TEXT | NUMBER: |
|-----------------|-------------------------------|---------|

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|----------|----------------------------------|-----------------------|------------------------------|--------|------|----------|
| USED AT: | AUTHOR: SoftTech<br>PROJECT: NTM | DATE: 9/17/82<br>REV: | WORKING<br>DRAFT             | READER | DATE | CONTEXT: |
|          | NOTES: 1 2 3 4 5 6 7 8 9 10      |                       | X RECOMMENDED<br>PUBLICATION |        |      |          |

any AP in any other AP in the IISS system. Each AP is seen by the NTM as a stand-alone unit that is fully capable of performing its own processing and normally terminating itself.

The NTM provides the common operating thread for each AP cluster. An NTM will be associated with each AP cluster to provide for message management, process management, and to maintain AP cluster and system operability. These functions are discussed in detail in the NTM OS Model below.

The NTM is an AP cluster's contact point with the rest of the IISS "world." Messages from outside the AP cluster (111) are received by the NTM (Box 1). The NTM determines whether the message belongs to the AP cluster based upon the Message Definition (101). Where the message does not belong to the AP cluster (for reasons discussed in NTMDS/AL) the message is sent off the AP cluster (101). Where the message does belong to the AP cluster, it is delivered to the appropriate Application Process (102). Where the message belongs to the AP cluster, the NTM will use the host OS services (103) to perform functions as needed. OS process control responses (113) are sent to the NTM.

The NTM (Box 1) uses the Host OS services (Box 2) to control the application process (Box 3). During the process or upon completion of processing when the need arises to send a message to a user or to access another Application, the processing AP will send a message to the NTM (301). The NTM receives the message (112), processes and routes it to the appropriate application either on (102) or off (101) the AP cluster.

|                 |                               |         |
|-----------------|-------------------------------|---------|
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|-----------------|-------------------------------|---------|

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|-----------------------------|----------------------------------|-----------------------|-----------------------------------------------------------------------------------------|--------|------|----------|
| USED AT:                    | AUTHOR: SoftTech<br>PROJECT: NTM | DATE: 9/17/82<br>REV: | WORKING<br>DRAFT                                                                        | READER | DATE | CONTEXT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                  |                       | <input checked="" type="checkbox"/> RECOMMENDED<br><input type="checkbox"/> PUBLICATION |        |      |          |

In this environment, the functions that are performed by the Host OS (Box 2) and the application process (Box 3) are outside the jurisdiction of the NTM.

The function of maintaining the AP cluster is also provided by the NTM. Messages regarding system operation (startup, shutdown, recover, restart) are sent to the NTM (IC1).

|                 |                               |         |
|-----------------|-------------------------------|---------|
| MODE: ENW/A-113 | TITLE: NTM ENVIRONMENT - TEXT | NUMBER: |
|-----------------|-------------------------------|---------|

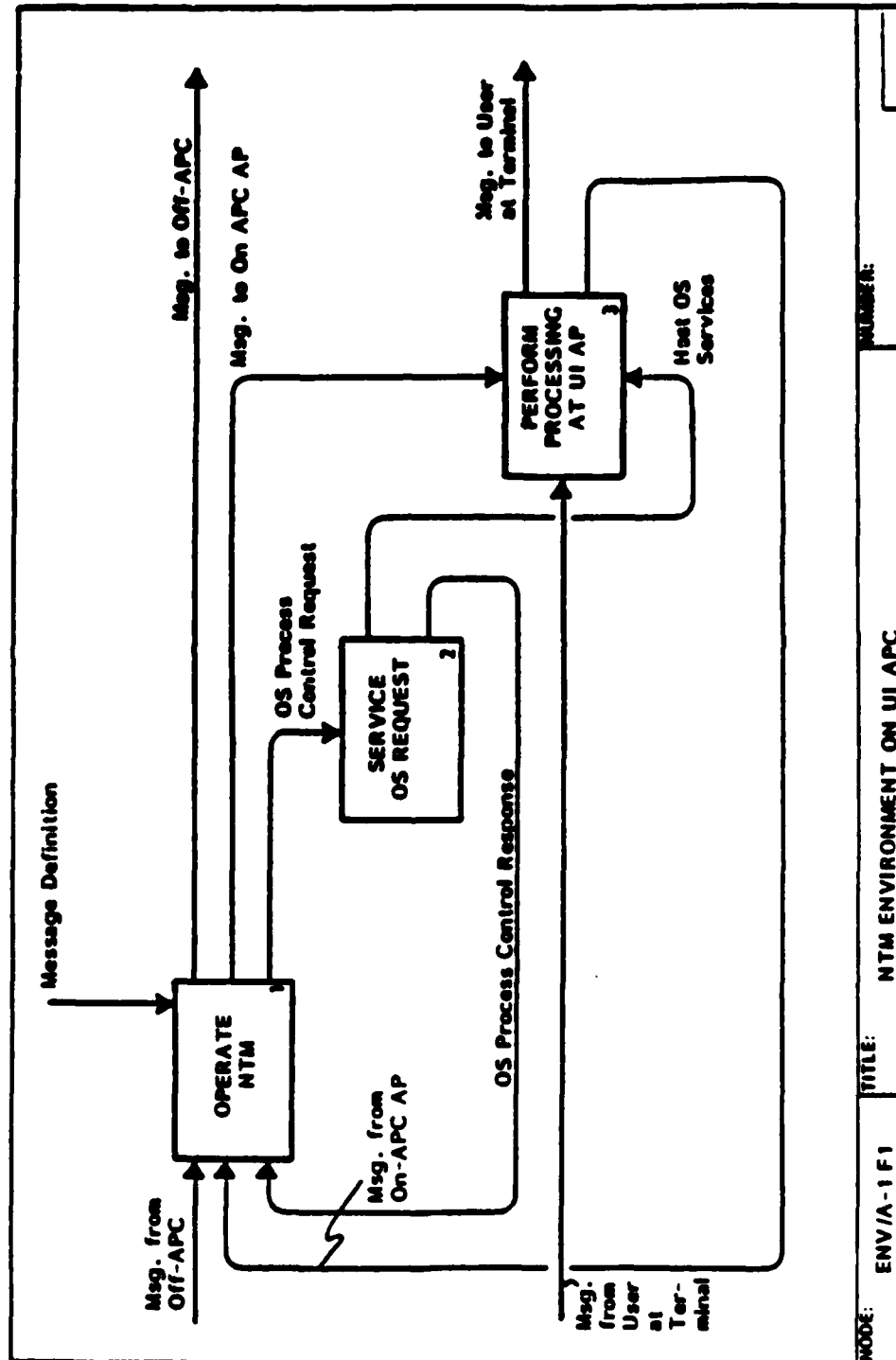
|                             |                                  |                       |                                                  |        |      |          |
|-----------------------------|----------------------------------|-----------------------|--------------------------------------------------|--------|------|----------|
| USED AT:                    | AUTHOR: SoftTech<br>PROJECT: NTM | DATE: 9/17/82<br>REV: | WORKING<br>DRAFT<br>X RECOMMENDED<br>PUBLICATION | READER | DATE | CONTEXT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                  |                       |                                                  |        |      |          |

The scenario sequence described for ENW/A-1 deviates slightly for two AP clusters; the User Interface (UI) and the Communications Handler (CHM). This is due to the fact that a message can be received by the UI or CHM Application process prior to NTM processing. Note that the only difference implied in these FEDs is the order in which a message is passed among the functions on the AP cluster. The NTM functions and interfaces are exactly the same in all cases.

The User Interface AP (Box 3 on F1) receives a message from a user at an IISS terminal (311). The User Interface AP will interact with the user (301, 311) to gather the data needed to formulate a transaction which will then be sent (302) to the NTM for routing. Messages routed to the UI from another AP cluster will be received first by the NTM and handled in the manner described for ENW/A-1.

The UI AP cluster provides for the isolation (download) of the screens (menus) that facilitate the user's interaction with an application process. This isolation removes screens from an AP and places them closer to the terminal. Thus, the UI-User Interaction allows the formulation of a transaction without the necessity of initiating the target application process. Further, all message traffic involved is kept within the AP cluster until the transaction is formed and routed thereby reducing the message traffic on the IISS.

|                  |                              |         |
|------------------|------------------------------|---------|
| MODE: ENW/A-1FTT | TITLE: NTM ENVIRONMENT ON UI | NUMBER: |
|------------------|------------------------------|---------|



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|                             |                                 |                       |                                                |        |      |          |
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| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                 |                       |                                                |        |      |          |

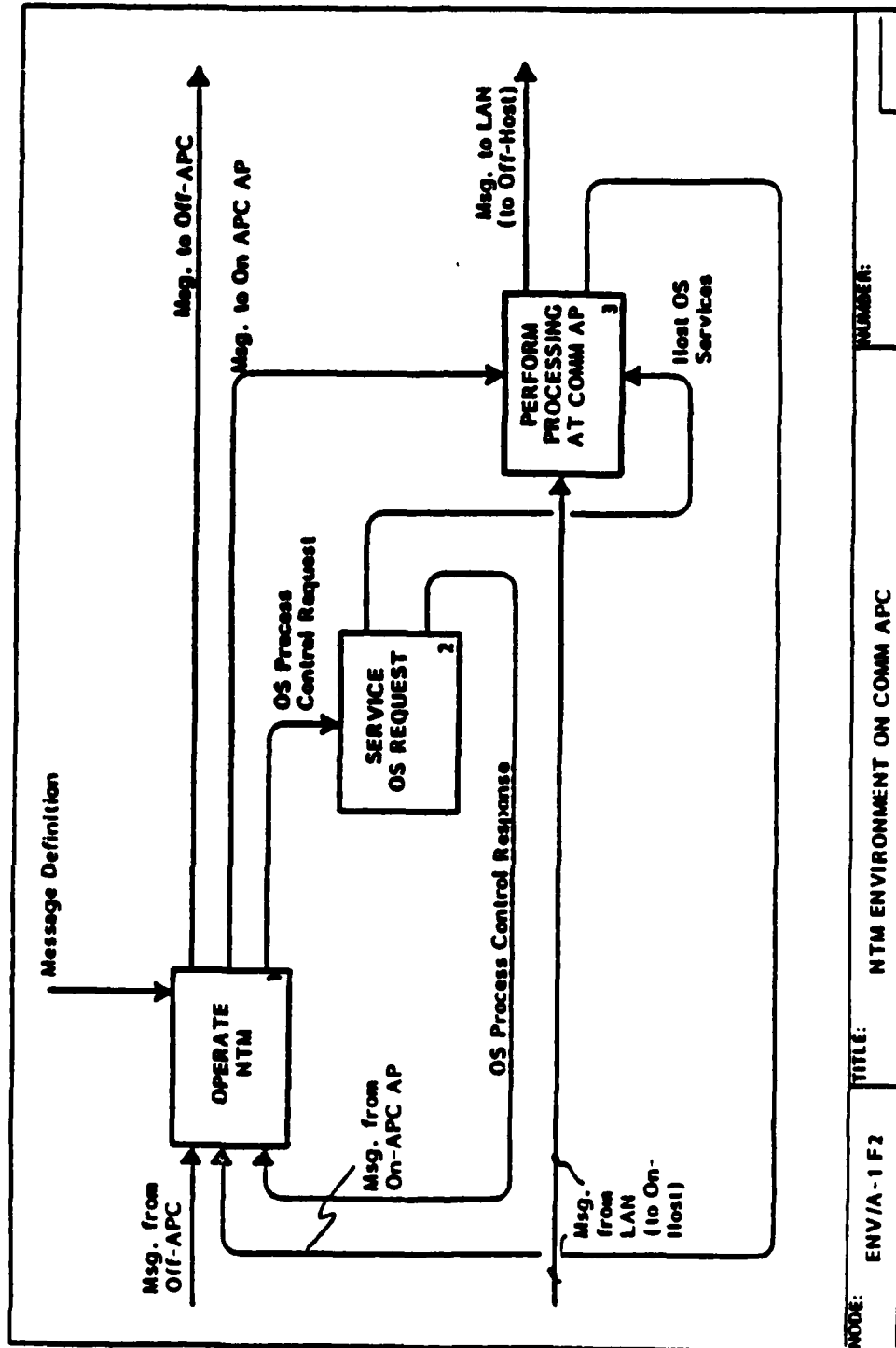
  

The COM AP is (like the UI) capable of receiving a message prior to local host NTM processing of the message.

The COM AP provides the host-to-host communication for the IISS. Where an NTM determines that a message belongs to a AP cluster other than its own, the destination is another AP cluster that is either on the same host or on another host in the IISS. Where the target AP cluster is on host, the message is sent to that AP cluster's NTM. Where the target AP cluster is off-host, the message is sent to the NTM for the host's COM AP Cluster (111). The off-host messages are sent to the COM AP (Box 3) from which they are sent to the LAN (301) as a single message stream.

The deviation from the EW/A-1 scenario when messages come into the COM AP from the LAN (311). These messages are received by the COM AP which then directs them to the COM AP Cluster NTM (302) for further routing.

|                  |                                  |         |
|------------------|----------------------------------|---------|
| MODE: ENV/A-1F2T | TITLE: NTM ENVIRONMENT ON COM IS | NUMBER: |
|------------------|----------------------------------|---------|

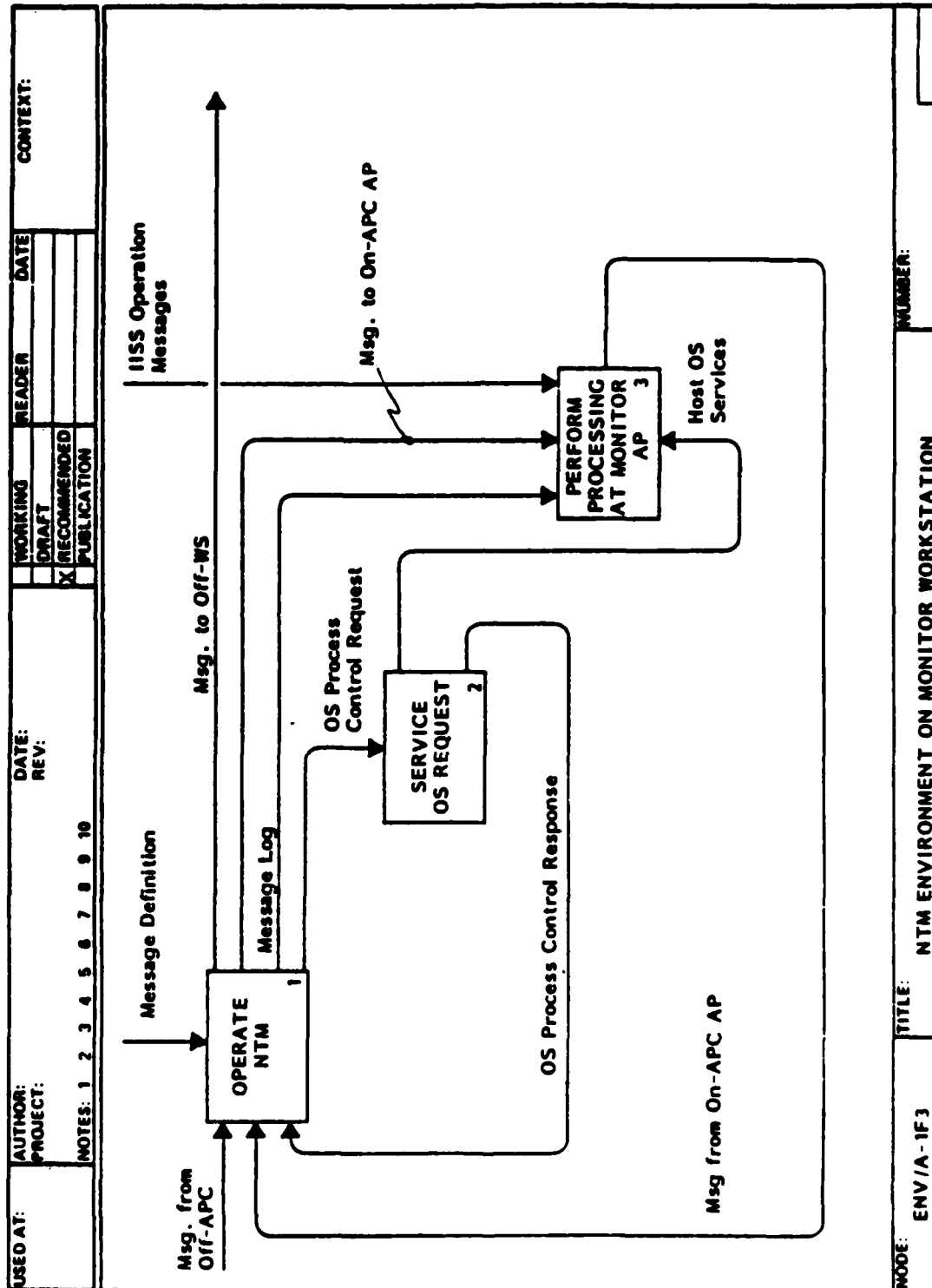




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| USED AT:                    | AUTHOR: PROJECT: | DATE: REV: | WORKING DRAFT<br>RECOMMENDED<br>PUBLICATION | READER: | DATE: | CONTENT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                  |            |                                             |         |       |          |

Host Tables

Msg. Definition

Msgs. from Off-APC

OS Process Control Response

Msgs. from On-Cluster

**OPERATE NTM**

Standards & Procedures

OS Process Control Request

Msg. to Off-Cluster

Msg. to On-APC AP's

Message Log

**Purpose:** This model will be used to define the function of the NTM as they relate to a single APC for the NTM Development Specification.

**Viewpoint:** An individual instance of an NTM's MPU and AP Interface Components as a stand alone system providing services to a Cluster of Application Processes (APC)

|           |                    |         |
|-----------|--------------------|---------|
| MODE: A-0 | TITLE: OPERATE NTM | NUMBER: |
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**MANAGE MESSAGE**

**CONTEXT:**

**WORKING** **READER** **DATE**

**DRAFT**

**X RECOMMENDED**

**PUBLICATION**

**DATE:** **REV:**

**NOTES:** 1 2 3 4 5 6 7 8 9 10

**USED AT:** **AUTHOR:** **PROJECT:**

**MODE:** **DS/A1**

**TITLE:** **NUMBER:**

```

graph TD
    1[RECEIVE & INTERPRET MESSAGE] --> 2[AUTHORIZE MESSAGE]
    2 --> 3[COMPLETE MESSAGE HEADER]
    2 --> 4[PERFORM SPECIAL MESSAGE HANDLING]
    3 --> 5[LOG MESSAGE]
    3 --> 6[ROUTE AND SEND MESSAGE]
    4 --> 5
    4 --> 6
    5 --> 6
    6 --> 7[Updated APC Tables]
    6 --> 8[Updated APC Queues]
    7 --> 7
    7 --> 8
    8 --> 7
    8 --> 8
  
```

**Process Flow:**

- RECEIVE & INTERPRET MESSAGE** (1) receives Msgs. from Off Cluster and sends them to **AUTHORIZE MESSAGE** (2).
- AUTHORIZE MESSAGE** (2) checks Category A, B, E, H messages with no Authorization Requirement. If they are reflected by MM, they go to **COMPLETE MESSAGE HEADER** (3). If they are not, they go to **PERFORM SPECIAL MESSAGE HANDLING** (4).
- AUTHORIZE MESSAGE** (2) also checks Category A, B, E, H messages. If they are reflected by MM, they go to **COMPLETE MESSAGE HEADER** (3). If they are not, they go to **PERFORM SPECIAL MESSAGE HANDLING** (4).
- COMPLETE MESSAGE HEADER** (3) sends Category A, B, E, H messages to **LOG MESSAGE** (5) and **ROUTE AND SEND MESSAGE** (6).
- PERFORM SPECIAL MESSAGE HANDLING** (4) sends Category A, B, E, H messages to **LOG MESSAGE** (5) and **ROUTE AND SEND MESSAGE** (6).
- LOG MESSAGE** (5) sends Category A, B, E, H messages to **ROUTE AND SEND MESSAGE** (6).
- ROUTE AND SEND MESSAGE** (6) sends Category A, B, E, H messages to **Updated APC Tables** (7) and **Updated APC Queues** (8).
- Updated APC Tables** (7) sends Category A, B, E, H messages to **Updated APC Tables** (7) and **Updated APC Queues** (8).
- Updated APC Queues** (8) sends Category A, B, E, H messages to **Updated APC Tables** (7) and **Updated APC Queues** (8).



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The flowchart illustrates the logic for the Maintain Cluster Operability (MO) program. It is organized into three main functional blocks: **HANDLE SYSTEM COMMANDS**, **HANDLE APC MSG. QUEUES**, and **HANDLE APC TABLES**.

- HANDLE SYSTEM COMMANDS:** This block receives inputs from **OS Responses** (labeled 12 and 11), **Msgs. for MO**, **Host Tables**, **Msg. Log**, **Msg. Definition**, and **APC Queues & Tables**. It contains sub-processes for **Response Msgs. to System Command**, **Host Tables**, **Msg. Definition**, **APC Table Update**, **APC Queue Update**, and **Queue Requests**. It outputs **OS Process Control Requests** (labeled 03 and 05) and **MO Msg. from On-Cluster**.
- HANDLE APC MSG. QUEUES:** This block receives **OS Responses** and **Msg. to Off-Cluster**. It outputs **OS Process Control Rqst.** and **Msg. to On-Cluster AP**.
- HANDLE APC TABLES:** This block receives **Msg. to On-Cluster AP**, **APC Table Update**, and **Recover Startup & Shutdown Command**. It outputs **OS Process Control Rqst.** and **Status Time-out Messages to Mon & MPUs**.

External components and data flows include:

- OS Process Control Requests:** Labeled 03 and 05, these are sent from the **HANDLE SYSTEM COMMANDS** block to the **OS Process Control Rqst.** output.
- MO Msg. from On-Cluster:** This message is sent from the **HANDLE SYSTEM COMMANDS** block to the **MO Msg. from On-Cluster** output.
- APC Queues & Tables:** This block is connected to the **HANDLE SYSTEM COMMANDS** and **HANDLE APC MSG. QUEUES** blocks.
- Host Tables:** This block is connected to the **HANDLE SYSTEM COMMANDS** block.
- Msg. Log:** This block is connected to the **HANDLE SYSTEM COMMANDS** block.
- Msg. Definition:** This block is connected to the **HANDLE SYSTEM COMMANDS** block.
- APC Table Update:** This block is connected to the **HANDLE APC TABLES** block.
- Recover Startup & Shutdown Command:** This block is connected to the **HANDLE APC TABLES** block.
- Status Time-out Messages to Mon & MPUs:** This output is generated by the **HANDLE APC TABLES** block.

APPENDIX C

C.1 IDEF1 Model of the NTM

The Model presented here represents the structure of the data required to perform the NTM functions. The data items identified in the model are defined in Appendix D (in lieu of a formal glossary). The table usage and structure is defined in Section 4.5.3.

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|          |                                  |  |                              |             |        |      |          |
|----------|----------------------------------|--|------------------------------|-------------|--------|------|----------|
| USED AT: | AUTHOR: SoftTech<br>PROJECT: NTM |  | DATE: 9/28/82<br>REV: 5/4/82 | WORKING     | READER | DATE | CONTEXT: |
|          | NOTES: 1 2 3 4 5 6 7 8 9 10      |  | 10/7/82                      | DRAFT       |        |      |          |
|          |                                  |  | 2/2/83                       | RECOMMENDED |        |      |          |
|          |                                  |  | 3/2/84                       | PUBLICATION |        |      |          |

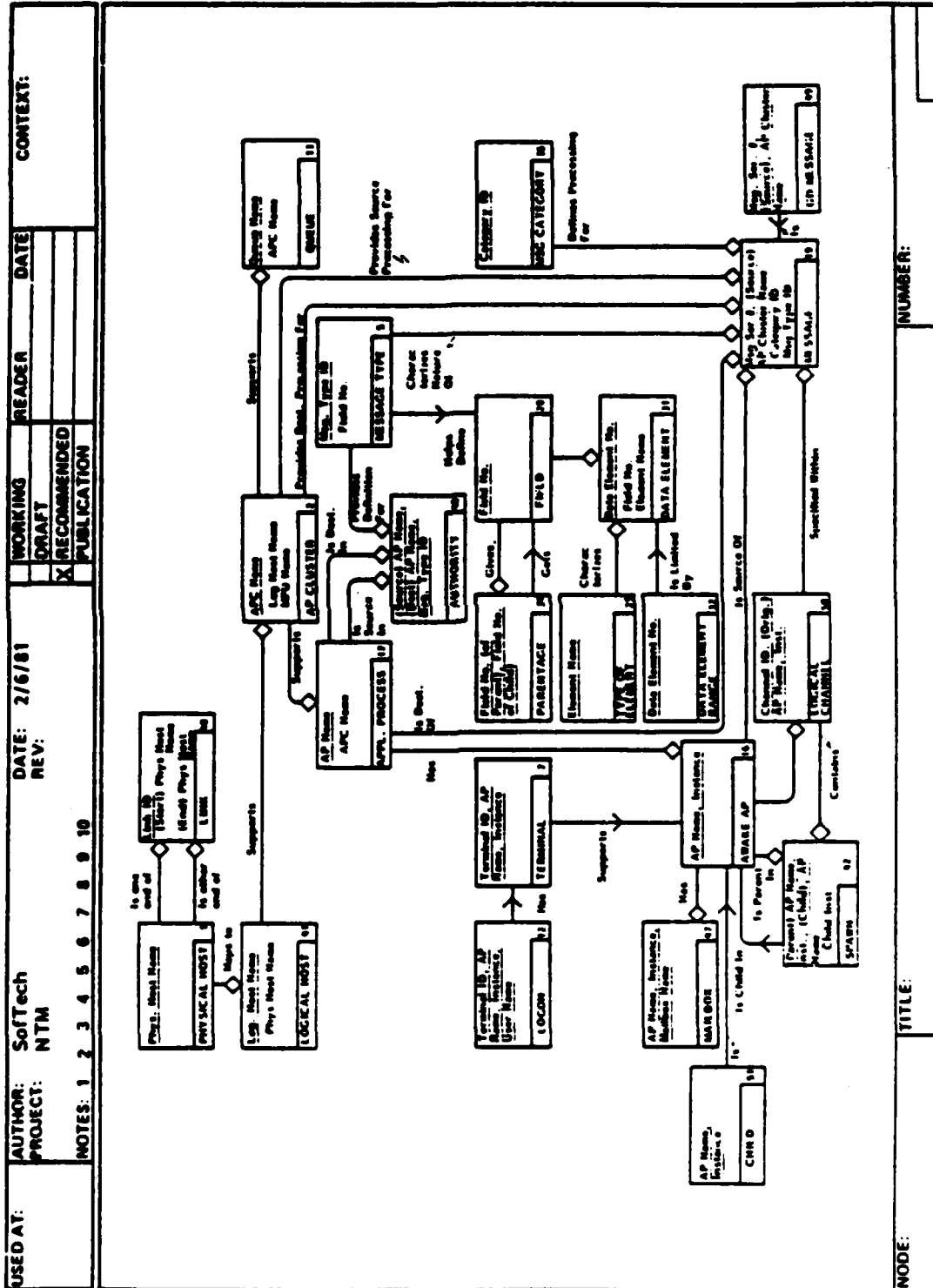
  

| Entity Class |                           | Entity Class |                    |
|--------------|---------------------------|--------------|--------------------|
| Node No.     | Name                      | Node No.     | Name               |
| E1           | PHYSICAL HOST             | E29          | TYPE OF ELEMENT    |
| E2           | AP CLUSTER                | E30          | PARENTAGE          |
| E5           | MESSAGE TYPE              | E31          | DATA ELEMENT       |
| E7           | TERMINAL                  | E32          | DATA ELEMENT RANGE |
| E11          | QUEUE                     | E36          | MESSAGE CATEGORY   |
| E12          | LOG ON                    | E40          | AUTHORITY          |
| E16          | AWAKE APPLICATION PROCESS | E41          | LOGICAL HOST       |
| E17          | APPLICATION PROCESS       | E42          | SPAWN              |
| E19          | MESSAGE                   | E47          | MAILBOX            |
| E20          | POST                      | E48          | LINK               |
| E21          | WAIT                      | E49          | GD MESSAGE         |
| E28          | FIELD                     | E50          | LOGICAL CHANNEL    |
|              |                           | E51          | CHILD              |
|              |                           | E52          | QUEUE SERVER       |
|              |                           | E53          | CONNECTION         |

|       |                          |         |
|-------|--------------------------|---------|
| NODE: | TITLE: ENTITY CLASS POOL | NUMBER: |
|-------|--------------------------|---------|

DS 620142000  
1 November 1985



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1 November 1985

|                             |                                  |                                         |                                                |        |      |          |
|-----------------------------|----------------------------------|-----------------------------------------|------------------------------------------------|--------|------|----------|
| USED AT:                    | AUTHOR: SoftTech<br>PROJECT: NTM | DATE: 4/21/82<br>REV: 6/20/82<br>2/2/83 | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION | READER | DATE | CONTEXT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                  |                                         |                                                |        |      |          |

PHYSICAL HOST

Host Status

PHYSICAL HOST

Is One End Of

Is Other End Of

41

LOGICAL HOST

48

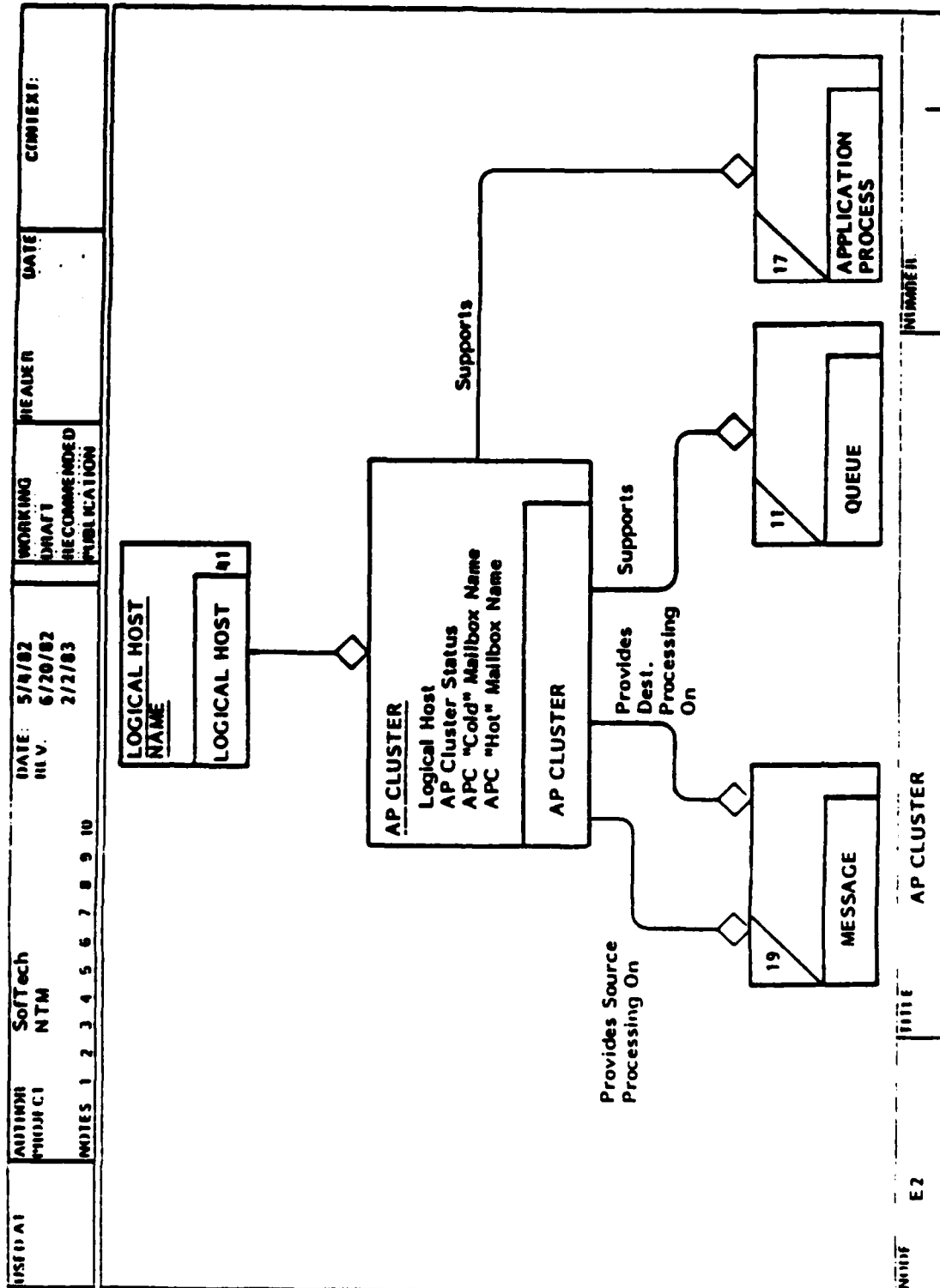
LINK

Maps To

|            |                       |        |
|------------|-----------------------|--------|
| MODE<br>E1 | TITLE<br>HOST MACHINE | NUMBER |
|------------|-----------------------|--------|





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1 November 1985

|                             |                                  |                              |                                                |        |      |          |
|-----------------------------|----------------------------------|------------------------------|------------------------------------------------|--------|------|----------|
| USED AT                     | AUTHOR: SoftTech<br>PROJECT: NTM | DATE: 10/7/82<br>REV: 2/2/83 | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION | HEADER | DATE | CONTEXT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                  |                              |                                                |        |      |          |

FIELD NO.

FIELD 28

Helps Define

```

graph TD
    MTID["MESSAGE TYPE ID  
Field No.  
Data Format"]
    MT["MESSAGE TYPE"]
    M["MESSAGE 19"]
    A["AUTHORITY 40"]

    MTID ---|Characterizes Nature Of| MT
    MT ---|Provides Definition For| A
    MTID ---|Helps Define| F["FIELD 28"]
    
```

MESSAGE 19

AUTHORITY 40

|            |                       |         |
|------------|-----------------------|---------|
| NODE<br>E5 | TITLE<br>MESSAGE TYPE | NUMBER: |
|------------|-----------------------|---------|

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|         |                             |              |                         |       |          |
|---------|-----------------------------|--------------|-------------------------|-------|----------|
| USED AT | AUTHOR: SoftTech            | DATE: 5/4/83 | READER:                 | DATE: | CONTEXT: |
|         | PROJECT: NTM                | REV: 2/2/83  | WORKING DRAFT           |       |          |
|         | NOTES: 1 2 3 4 5 6 7 8 9 10 |              | RECOMMENDED PUBLICATION |       |          |

```

classDiagram
    class AP_NAME_INSTANCE["AP NAME, INSTANCE"] {
        AWAKE AP
    }
    class TERMINAL_ID_AP_NAME_INSTANCE["TERMINAL ID, AP NAME, INSTANCE"] {
        TERMINAL
    }
    class LOG_ON["LOG ON"]
    AP_NAME_INSTANCE "1" -- "1" TERMINAL_ID_AP_NAME_INSTANCE : Supports
    TERMINAL_ID_AP_NAME_INSTANCE "1" -- "1" LOG_ON : Has
  
```

The diagram illustrates the following components and relationships:

- Entity 1:** A box labeled "AP NAME, INSTANCE" containing a sub-box "AWAKE AP" with the number "16" in the bottom right corner.
- Entity 2:** A box labeled "TERMINAL ID, AP NAME, INSTANCE" containing a sub-box "TERMINAL".
- Entity 3:** A box labeled "LOG ON" with the number "12" in the bottom left corner.
- Relationship 1:** A line connects Entity 1 and Entity 2, ending in a diamond shape. The label "Supports" is placed above the line.
- Relationship 2:** A line connects Entity 2 and Entity 3, ending in a crow's foot notation. The label "Has" is placed above the line.

|          |        |          |         |
|----------|--------|----------|---------|
| MODE: E7 | TITLE: | TERMINAL | NUMBER: |
|----------|--------|----------|---------|

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1 November 1985

|                            |                                 |                                        |                  |         |       |          |
|----------------------------|---------------------------------|----------------------------------------|------------------|---------|-------|----------|
| USED AT:                   | AUTHOR: SofTech<br>PROJECT: NTM | DATE: 5/8/82<br>REV: 6/20/82<br>2/2/83 | WORKING<br>DRAFT | READER: | DATE: | CONTENT: |
| NOTES 1 2 3 4 5 6 7 8 9 10 |                                 | RECOMMENDED<br>PUBLICATION             |                  |         |       |          |

AP CLUSTER NAME  

AP CLUSTER 2

Supports

QUEUE NAME  
APC Name  
Queue Status  
Queue Length

QUEUE

|               |       |                 |
|---------------|-------|-----------------|
| SOURCE<br>E11 | TITLE | KIND OF BACKLOG |
|---------------|-------|-----------------|

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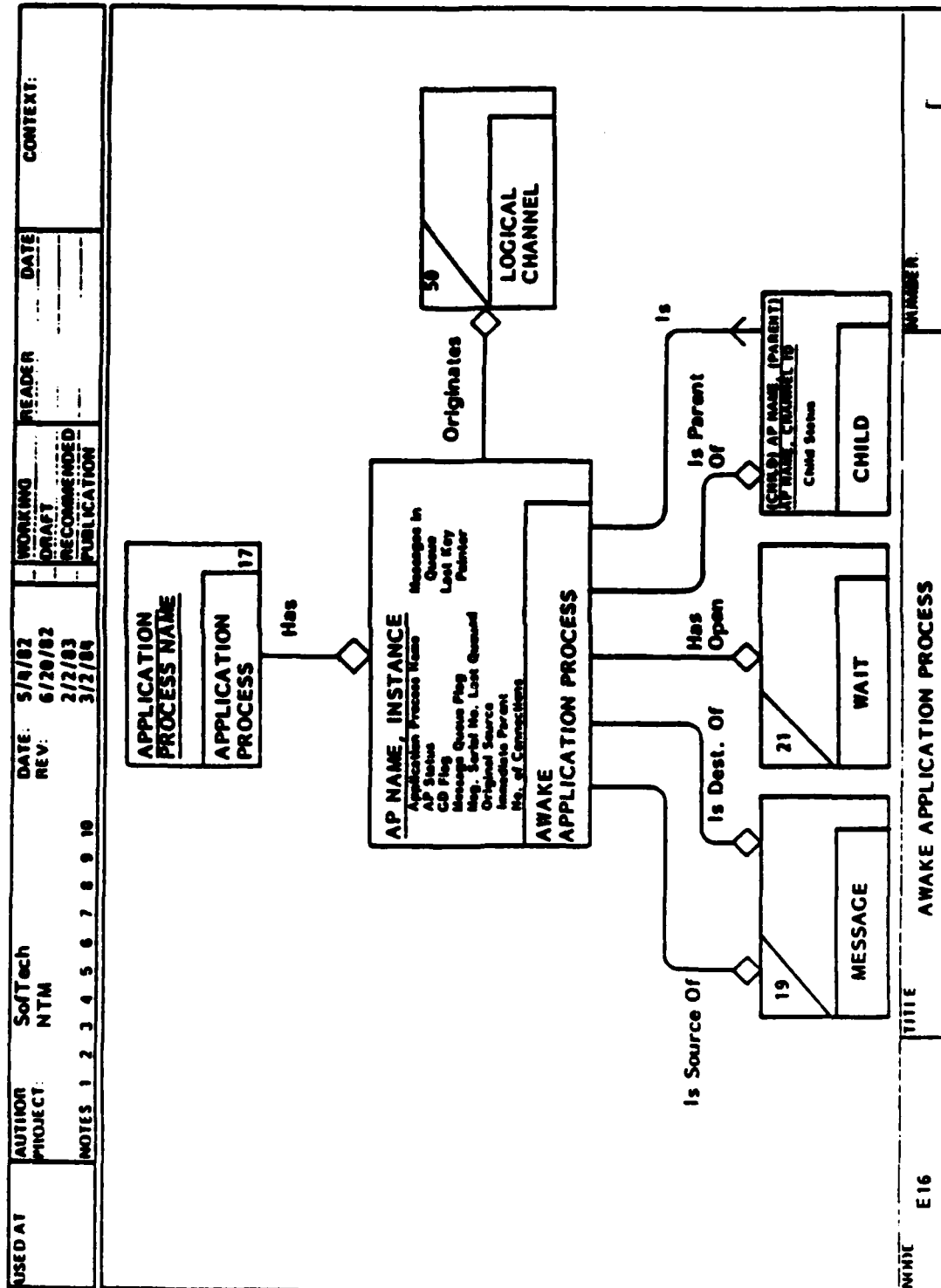
|         |                   |                 |                            |      |         |                                                |        |      |          |
|---------|-------------------|-----------------|----------------------------|------|---------|------------------------------------------------|--------|------|----------|
| USE DAT | ATTNDR<br>PROJECT | SoftTech<br>NTM | NOTES 1 2 3 4 5 6 7 8 9 10 | DATE | 5/8/82  | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION | HEADER | DATE | CONTEXT: |
|         |                   |                 |                            | REV  | 6/28/82 |                                                |        |      |          |

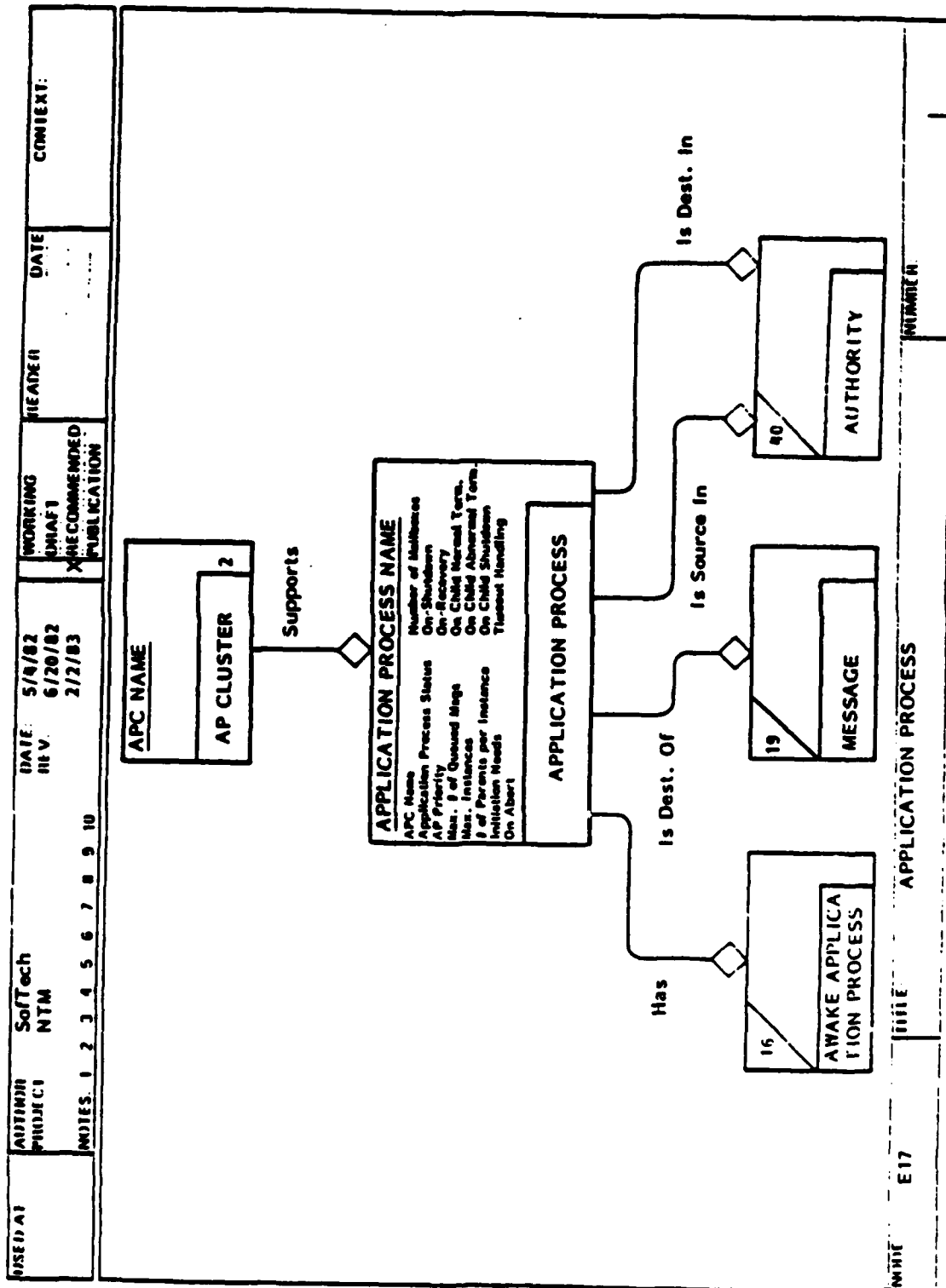
  

|                                                       |                                                                                                                                               |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| TERMINAL ID AP<br><u>NAME, INSTANCE</u><br>TERMINAL 7 | TERMINAL NO., AP NAME,<br><u>INSTANCE, USER NAME</u><br>Role Name<br>Session Start Time<br>Channel Range Start<br>Channel Range End<br>LOG ON |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

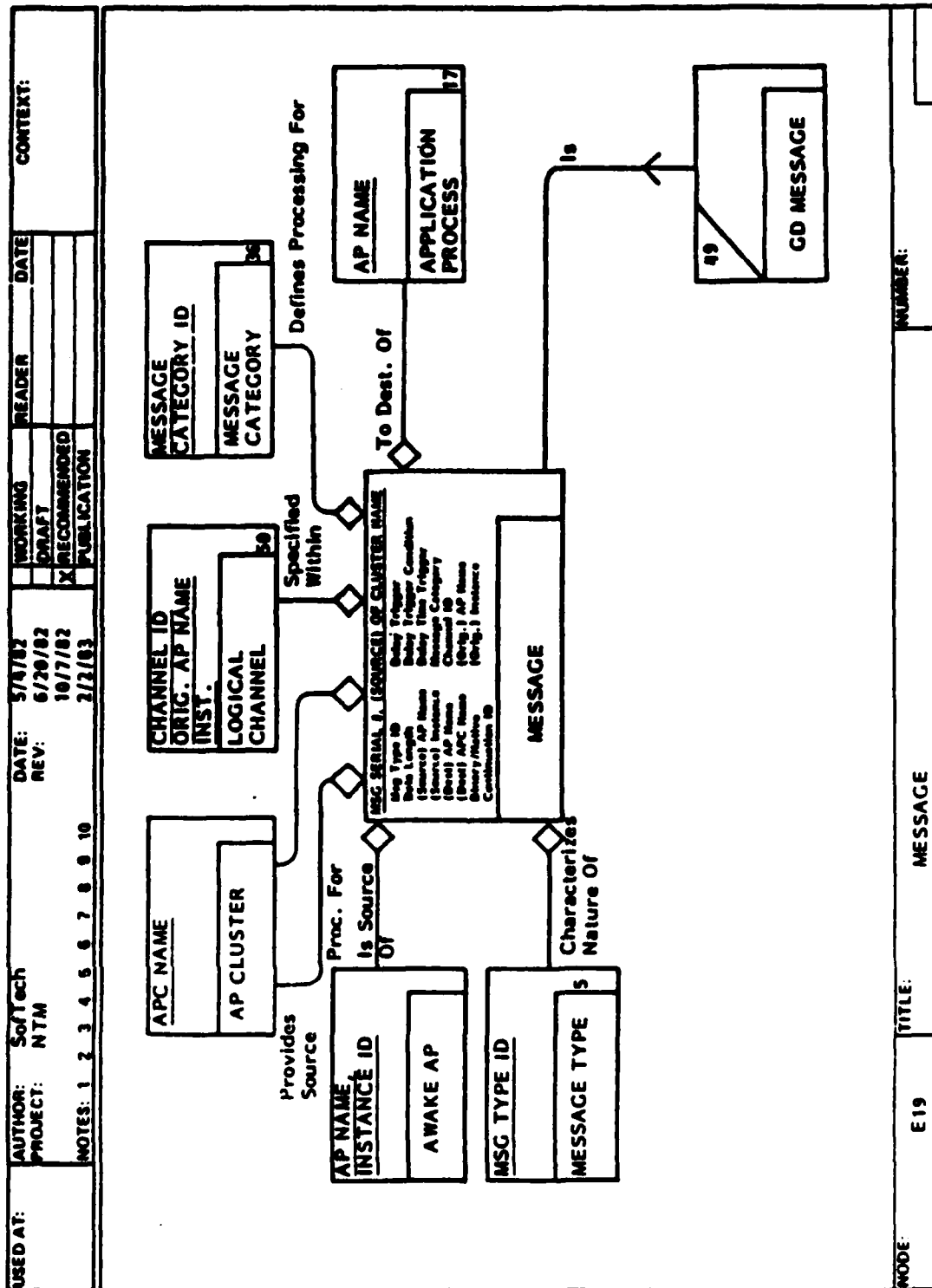
  

|      |     |       |        |         |
|------|-----|-------|--------|---------|
| NOTE | E12 | TITLE | LOG ON | NUMBER: |
|------|-----|-------|--------|---------|





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1 November 1985





DS 620142000  
1 November 1985

|          |                  |              |             |        |      |          |
|----------|------------------|--------------|-------------|--------|------|----------|
| USED AT: | AUTHOR: SoftTech | DATE: 5/8/82 | WORKING     | READER | DATE | CONTENT: |
|          | PROJECT: NTM     | REV: 6/20/82 | DRAFT       |        |      |          |
|          |                  |              | RECOMMENDED |        |      |          |
|          |                  |              | PUBLICATION |        |      |          |

|          |   |   |   |   |   |   |   |   |    |
|----------|---|---|---|---|---|---|---|---|----|
| NOTES: 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------|---|---|---|---|---|---|---|---|----|

```

graph TD
    FS["FIELD NO.  
Field Specification"]
    F["FIELD"]
    MT["MESSAGE TYPE  
5"]
    P["PARENTAGE  
30"]
    DE["DATA ELEMENT  
31"]

    FS -- "Helps Define" --> MT
    F -- "Gets" --> P
    F -- "Gives" --> P
    F -- "Consists Of" --> DE
  
```

The diagram illustrates the relationships between various field-related entities. A central box labeled 'FIELD NO. Field Specification' is connected to four other boxes: 'MESSAGE TYPE' (with a diagonal line and number 5), 'PARENTAGE' (with a diagonal line and number 30), 'DATA ELEMENT' (with a diagonal line and number 31), and another 'FIELD' box. The connections are labeled: 'Helps Define' from Field Specification to Message Type, 'Gets' and 'Gives' between Field Specification and Parentage, and 'Consists Of' from Field Specification to Data Element.

|      |     |        |       |         |
|------|-----|--------|-------|---------|
| MODE | E28 | TITLE: | FIELD | NUMBER: |
|------|-----|--------|-------|---------|

DS 620142000  
1 November 1985

|                             |                 |              |             |        |      |          |
|-----------------------------|-----------------|--------------|-------------|--------|------|----------|
| USED AT:                    | AUTHOR: Softech | DATE: 5/9/82 | WORKING     | READER | DATE | CONTENT: |
| PROJECT: NTM                | REV:            |              | DRAFT       |        |      |          |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                 |              | RECOMMENDED |        |      |          |
|                             |                 |              | PUBLICATION |        |      |          |

ELEMENT NAME

TYPE OF ELEMENT

Characterizes

—



31

DATA ELEMENT

|            |        |                 |         |
|------------|--------|-----------------|---------|
| MOORE: E29 | TITLE: | TYPE OF ELEMENT | NUMBER: |
|------------|--------|-----------------|---------|

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1 November 1985

|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                      |         |       |          |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------|-------|----------|
| USED AT:<br>AUTHOR: SoTech<br>PROJECT: NTM<br>NOTES: 1 2 3 4 5 6 7 8 9 10 | DATE: 5/9/82<br>REV:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WORKING<br><input checked="" type="checkbox"/> DRAFT<br><input type="checkbox"/> RECOMMENDED<br><input type="checkbox"/> PUBLICATION | READER: | DATE: | CONTENT: |
|                                                                           | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">             FIELD NO.<br/>             FIELD 20           </div> <div style="text-align: center;">             Gets<br/>             ———<br/>             Gives           </div> <div style="border: 1px solid black; padding: 5px; text-align: center;">             FIELD NO. (of Parent).<br/>             FIELD NO. (of Child)           </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">             PARENTAGE           </div> </div> |                                                                                                                                      |         |       |          |
| NAME: E 30                                                                | TITLE:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | PARENTAGE                                                                                                                            | NUMBER: |       |          |

DS 620142000  
1 November 1985

|                             |                                 |                      |                                                                                                             |        |      |          |
|-----------------------------|---------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------|--------|------|----------|
| USED AT:                    | AUTHOR: So/Tech<br>PROJECT: NTM | DATE: 5/8/82<br>REV: | WORKING<br><input checked="" type="checkbox"/> DRAFT<br><input type="checkbox"/> RECOMMENDED<br>PUBLICATION | READER | DATE | COMMENT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                 |                      |                                                                                                             |        |      |          |

FIELD NO.  
 FIELD

ELEMENT NAME  
 TYPE OF ELEMENT

Consists Of

DATA ELEMENT NO.  
 Field No.  
 Element Name

DATA ELEMENT

Is Limited By

32

DATA ELEMENT RANGE

|           |        |         |
|-----------|--------|---------|
| CODE: E31 | TITLE: | NUMBER: |
|-----------|--------|---------|

DS 620142000  
1 November 1985

|                             |                                 |                      |                                                                                                                                      |        |      |          |
|-----------------------------|---------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------|------|----------|
| USED AT:                    | AUTHOR: SolTech<br>PROJECT: NTM | DATE: 5/9/82<br>REV: | WORKING<br><input checked="" type="checkbox"/> DRAFT<br><input type="checkbox"/> RECOMMENDED<br><input type="checkbox"/> PUBLICATION | READER | DATE | CONTENT: |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                                 |                      |                                                                                                                                      |        |      |          |

DATA ELEMENT NO.  
DATA ELEMENT

Is Limited By

DATA ELEMENT NO.  
DATA ELEMENT RANGE

|           |        |                    |         |
|-----------|--------|--------------------|---------|
| MODE: E32 | TITLE: | DATA ELEMENT RANGE | NUMBER: |
|-----------|--------|--------------------|---------|

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1 November 1985

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                 |                       |                                                |        |         |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------|------------------------------------------------|--------|---------|----------|
| USED AT:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | AUTHOR: Softech<br>PROJECT: NTM | DATE: 10/7/82<br>REV: | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION | READER | DATE    | CONTEXT: |
| <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>MESSAGE CATEGORY ID</b><br/>           Authorization Requirement<br/>           Pairing Requirement<br/>           Guaranteed Delivery<br/>           Statistics Collection Flag<br/>           Message Priority<br/>           Log Requirement         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>MESSAGE CATEGORY</b> </div> <div style="margin-bottom: 10px;">       Defines Processing For     </div> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">         19       </div> <div style="border: 1px solid black; padding: 5px;"> <b>MESSAGE</b> </div> </div> </div> |                                 |                       |                                                |        |         |          |
| MODE: E 36                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TITLE:                          | MESSAGE CATEGORY      |                                                |        | NUMBER: |          |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                 |                      |                                                                                                                           |        |      |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------|--------|------|----------|
| USED AT:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | AUTHOR: SoTtech<br>PROJECT: NTM | DATE: 2/2/83<br>REV: | WORKING<br><input type="checkbox"/> DRAFT<br><input type="checkbox"/> RECOMMENDED<br><input type="checkbox"/> PUBLICATION | READER | DATE | CONTEXT: |
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <u>AP NAME</u><br/>           APPLICATION<br/>           PROCESS         </div> <div style="text-align: center;"> <p>Is Source In</p> <p>Is Dest. In</p> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <u>MSG. TYPE ID</u><br/>           MESSAGE TYPE         </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">           17         </div> <div style="text-align: center;"> <p>Provides Definition For</p> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;">           5         </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">           (SOURCE) AP NAME, (DEST)<br/>           AP NAME, MSG TYPE ID         </div> <div style="border: 1px solid black; padding: 5px; text-align: center;">           AUTHORITY         </div> </div> |                                 |                      |                                                                                                                           |        |      |          |
| NODE E40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TITLE: AUTHORITY                | NUMBER:              |                                                                                                                           |        |      |          |

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1 November 1985

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                 |                                                |                |          |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------|----------------|----------|
| USED AT<br>PROJECT<br>NOTES 1 2 3 4 5 6 7 8 9 10 | AUTHOR<br>PROJECT<br>SoftTech<br>NTM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | DATE<br>REV<br>2/2/83<br>3/2/84 | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION | HEADER<br>DATE | CONTEXT: |
|                                                  | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <u>PHYSICAL HOST NAME</u><br/>             PHYSICAL HOST 1           </div> <div style="text-align: center;">             Maps To<br/>             ◇           </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <u>LOGICAL HOST NAME</u><br/>             Physical Host Name<br/> <div style="border: 1px solid black; padding: 5px; text-align: center; margin-top: 5px;">               LOGICAL HOST             </div> </div> <div style="text-align: center;">             Supports<br/>             ◇           </div> <div style="border: 1px solid black; padding: 5px; text-align: center;">             2<br/>             AP CLUSTER           </div> </div> |                                 |                                                |                |          |
|                                                  | E41                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | LOGICAL HOST                    | NUMBER                                         |                |          |



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1 November 1985

|                             |                 |              |               |      |          |
|-----------------------------|-----------------|--------------|---------------|------|----------|
| USED AT:                    | AUTHOR: Softech | DATE: 2/2/83 | READER        | DATE | CONTEXT: |
|                             | PROJECT: NTM    | REV: 3/2/84  | WORKING DRAFT |      |          |
|                             |                 |              | RECOMMENDED   |      |          |
|                             |                 |              | PUBLICATION   |      |          |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                 |              |               |      |          |

AP NAME  
INSTANCE  
 16  
 AWAKE AP

CHANNEL ID,  
 (ORIG SOURCE) AP  
 NAME, INSTANCE  
 50  
 LOGICAL  
 CHANNEL

Is Parent Of

(PARENT) AP NAME, INSTANCE  
 (CHILD) AP NAME, CHILD  
 INSTANCE CHANNEL ID

SPAWN

Contains

|           |              |         |
|-----------|--------------|---------|
| CODE: E42 | TITLE: SPAWN | NUMBER: |
|-----------|--------------|---------|

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|        |                             |              |             |        |      |          |
|--------|-----------------------------|--------------|-------------|--------|------|----------|
| USEUAT | AUTHOR: SotTech             | DATE: 2/2/83 | WORKING     | READER | DATE | CONTEXT: |
|        | PROJECT: NTM                | REV:         | DRAFT       |        |      |          |
|        | NOTES: 1 2 3 4 5 6 7 8 9 10 |              | RECOMMENDED |        |      |          |
|        |                             |              |             |        |      |          |

AP NAME  
INSTANCE

AWAKE AP 16

Has

AP NAME, INSTANCE, MAILBOX  
NAME

MAILBOX

|           |                |         |
|-----------|----------------|---------|
| PAGE: E47 | TITLE: MAILBOX | NUMBER: |
|-----------|----------------|---------|

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|                             |                  |              |        |             |             |
|-----------------------------|------------------|--------------|--------|-------------|-------------|
| USED AT                     | AUTHOR: SoftTech | DATE: 7/7/83 | READER | DATE        | CONTENT:    |
|                             | PROJECT: NTM     | REV.         |        |             |             |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                  | WORKING      | DRAFT  | RECOMMENDED | PUBLICATION |

PHYSICAL HOST NAME  
 PHYSICAL HOST 1

Is One End Of

Is Other End Of

LINK ID  
 (Start) Physical Host Name  
 (End) Physical Host Name  
 Link Status  
  
 LINK

|      |    |       |      |        |
|------|----|-------|------|--------|
| WIDE | EQ | TITLE | LINK | NUMBER |
|------|----|-------|------|--------|

DS 620142000  
1 November 1985

|                            |                   |                                                |              |        |      |          |
|----------------------------|-------------------|------------------------------------------------|--------------|--------|------|----------|
| USED AT                    | AUTHOR<br>PROJECT | DATE<br>REV.                                   | DATE<br>REV. | READER | DATE | CONTEXT: |
|                            |                   |                                                |              |        |      |          |
| NOTES 1 2 3 4 5 6 7 8 9 10 |                   | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION |              |        |      |          |

MSG. SERIAL #  
(SOURCE) AP  
CLUSTER  
MESSAGE

Is

MSG SERIAL #, (SOURCE) AP  
CLUSTER  
Time Stamp When Accepted  
GD MESSAGE

|      |     |                   |         |
|------|-----|-------------------|---------|
| MODE | E49 | TITLE: GD MESSAGE | NUMBER: |
|------|-----|-------------------|---------|

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |                          |                                                |                |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------|------------------------------------------------|----------------|----------|
| USED AT<br>PROJECT:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | AUTHOR: SoftTech<br>PROJECT: NTM | DATE: 2/2/83<br>REV:     | WORKING<br>DRAFT<br>RECOMMENDED<br>PUBLICATION | READER<br>DATE | CONTEXT: |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>NOTES: 1 2 3 4 5 6 7 8 9 10</p> </div> <div style="width: 80%; text-align: center;"> <pre> graph TD     subgraph AP_NAME_BOX [AP NAME]         AWAKE_AP[AWAKE AP 16]     end     subgraph CHANNEL_ID_BOX [CHANNEL ID, (ORIG) AP NAME]         LOGICAL_CHANNEL[LOGICAL CHANNEL]     end     subgraph SPAWN_BOX [SPAWN]         SPAWN[SPAWN]     end     AWAKE_AP -- "Originates" --&gt; CHANNEL_ID_BOX     LOGICAL_CHANNEL -- "Contains" --&gt; SPAWN_BOX           </pre> </div> </div> |                                  |                          |                                                |                |          |
| NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | E50                              | TITLE<br>LOGICAL CHANNEL | NUMBER:                                        |                |          |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |       |              |  |         |        |      |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|--------------|--|---------|--------|------|----------|
| USED AT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | AUTHOR:                     |       | DATE: 2/2/83 |  | WORKING | READER | DATE | CONTENT: |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PROJECT:                    |       | REV:         |  |         |        |      |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NOTES: 1 2 3 4 5 6 7 8 9 10 |       |              |  |         |        |      |          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |       |              |  |         |        |      |          |
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <u>AP NAME, INSTANCE</u><br/>             A WAKE AP           </div> <div style="text-align: center;">             Is<br/>  </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <u>AP NAME, INSTANCE</u><br/>             Child Status<br/>             Child Rank<br/> <br/>             CHILD           </div> </div> |                             |       |              |  |         |        |      |          |
| CODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 51                          | TITLE | CHILD        |  | NUMBER: |        |      |          |

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|                             |                  |               |             |        |      |          |
|-----------------------------|------------------|---------------|-------------|--------|------|----------|
| USED AT:                    | AUTHOR: SoftTech | DATE: 1/19/84 | WORKING     | READER | DATE | CONTEXT: |
|                             | PROJECT: NTM     | REV:          | DRAFT       |        |      |          |
|                             |                  |               | RECOMMENDED |        |      |          |
|                             |                  |               | PUBLICATION |        |      |          |
| NOTES: 1 2 3 4 5 6 7 8 9 10 |                  |               |             |        |      |          |

```

classDiagram
    class ApplicationProcess {
        AP NAME
        APPLICATION PROCESS
        17
    }
    class QueueServerType {
        AP NAME
        Queue Server Type
        QUEUE SERVER
    }
    class Connection {
        S3
        CONNECTION
    }
    ApplicationProcess --> QueueServerType : Is
    QueueServerType --> Connection : Supports
  
```

|           |                     |         |
|-----------|---------------------|---------|
| MODE: E52 | TITLE: QUEUE SERVER | NUMBER: |
|-----------|---------------------|---------|

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|          |                             |               |             |        |      |          |
|----------|-----------------------------|---------------|-------------|--------|------|----------|
| USED AT: | AUTHOR: SoftTech            | DATE: 2/27/84 | WORKING     | READER | DATE | CONTEXT: |
|          | PROJECT: NTM                | REV:          | DRAFT       |        |      |          |
|          | NOTES: 1 2 3 4 5 6 7 8 9 10 |               | RECOMMENDED |        |      |          |
|          |                             |               | PUBLICATION |        |      |          |

```

classDiagram
    class QueueServer {
        AP NAME
        52
    }
    class PseudoInstance {
        AP NAME, PSEUDO INSTANCE
        CONNECTION
    }
    QueueServer --> PseudoInstance : Supports
  
```

|          |                   |         |
|----------|-------------------|---------|
| MODE: E3 | TITLE: CONNECTION | NUMBER: |
|----------|-------------------|---------|



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APPENDIX D

DATA ITEM DESCRIPTIONS

Each data item required by the NTM is defined below. The items are presented in alphabetical order for easy reference. The data items used by the AP interface services are described in the System Services Manual [8].

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1 November 1985

Data Item Name: Access Flag

Data Item ID: ACCFLG

Data Item Description:

Identifies whether the access to a given AP is restricted or open. This applies only to messages belonging to categories defined as requiring authorization.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: N/A

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: Authority Check Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                |
|---------------------|-----------------------------|--------------------------------------------------------|
| Restricted          | 0                           | Ap has restricted Access - requires an authority check |
| Open                | 1                           | AP has open access - no authority required             |

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1 November 1985

Data Item Name: ACK to Source MPU

Data Item ID: MPUACK

Data Item Description:

Identifies whether the message causing the initiation of an AP conforms to category E (unsolicited message). Where the initiation message is category E, the destination MPU will return an unsolicited Initiation Accept (message type IA) to the source MPU.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: N/A

Data Item Stability: Dynamic

Legal Value Set By:  
Message Category

Where Used: I'm Alive Table  
Value

| <u>Legal Values</u> | <u>Representation</u> | <u>Value Definition</u>       |
|---------------------|-----------------------|-------------------------------|
| No Send ACK         | 0                     | No ACK required on initiation |
| Send-ACK            | 1                     | ACK required on initiation    |

Data Item Name: AP Cluster "Cold" Mailbox      Data Item ID: APCCMB

Data Item Description:

The name of the mailbox used for low priority messages coming into the AP Cluster. The messages may either be from a resident AP or from another cluster.

The priority level is determined by the message category and is relative to the NTM. The priority under consideration in this case has no bearing on the priority of an Application Process.

Data Item Picture: X(14)  
Coding Type: Alpha/Numeric  
Data Item Stability: Dynamic\*

Size in Bytes: 14  
IDEFl XRef: EC 2  
Legal Value Set By:  
Derivation from APC  
Name

Where Used: APC Startup

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>      |
|---------------------|-----------------------------|------------------------------|
| Mon-VAX-C-MBX       | MRVCbbbbbbbbbb**            | VAX Monitor APC Cold Mailbox |
| Mon-IBM-C-MBX       | MRICbbbbbbbbbb              | IBM Monitor APC Cold Mailbox |
| Mon-HL6-C-MBX       | MRHCbbbbbbbbbb              | HL6 Monitor APC Cold Mailbox |
| User-Int-C-MBX      | UIVCbbbbbbbbbb              | User Interface Cold Mailbox  |
| COMM-VAX-C-MBX      | COVCbbbbbbbbbb              | VAX COMM APC Cold Mailbox    |
| COMM-IBM-C-MBX      | COICbbbbbbbbbb              | IBM COMM APC Cold Mailbox    |
| COMM-HL6-C-MBX      | COHCbbbbbbbbbb              | HL6 COMM APC Cold Mailbox    |
| CDM-C-MBX           | CDMCbbbbbbbbbb              | CDM APC Cold Mailbox         |

\*In all cases, the distinction between static and dynamic data is based on whether the data is obtained from the CDM, or generated within the NTM. Therefore, data obtained from the CDM is static. All other items are dynamic.

\*\*Note: the last byte in the mailbox name is reserved for non-NTM use.

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1 November 1985

Data Item Name: AP Cluster "Hot" Mailbox      Data Item ID: APCHMB

Data Item Description:

The name of the mailbox used for high priority messages coming into the AP Cluster. The messages may either be from a resident AP or from another cluster.

Data Item Picture: X(14)

Size in Bytes: 14

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 2

Data Item Stability: Dynamic

Legal Value Set By:  
Derived from APC Name

Where Used: APC Startup

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>        |
|---------------------|-----------------------------|--------------------------------|
| Mon-VAX-H-MBX       | MRVHbbbbbbbbbbb*            | VAX Monitor APC Hot Mailbox    |
| Mon-IBM-H-MBX       | MRIHbbbbbbbbbbb*            | IBM Monitor APC Hot Mailbox    |
| Mon-HL6-H-MBX       | MRHHbbbbbbbbbbb             | HL6 Monitor APC Hot Mailbox    |
| User-Int-H-MBX      | UIVHbbbbbbbbbbb             | User Interface APC Hot Mailbox |
| COMM-VAX-H-MBX      | COVHbbbbbbbbbbb             | VAX COMM APC Hot Mailbox       |
| COMM-IBM-H-MBX      | COIHbbbbbbbbbbb             | IBM COMM APC Hot Mailbox       |
| COMM-HL6-H-MBX      | COHHbbbbbbbbbbb             | HL6 COMM APC Hot Mailbox       |
| CDM-H-MBX           | CDMHbbbbbbbbbbb             | CDM APC Hot Mailbox            |

\*Note: The last byte in the mailbox name is reserved for non-NTM use.

Data Item Name: AP Cluster Name

Data Item ID: APCNME

Data Item Description:

The AP Cluster name identifies a given occurrence of an AP Cluster residing on the IISS. An AP Cluster is defined as a logically related group of application processes that reside on a single host machine. The processes are collected at a single AP Cluster because of their common need to access the same database. A cluster may not have any database but it will never have more than one.

Each cluster within the IISS is controlled by its own occurrence of an MPU. The control by the MPU extends to receiving messages, verifying messages, rejecting bad messages, routing messages to their appropriate destination, and servicing the resident application processes via the AP Interface.

The AP Cluster is always assigned to a single logical host but that assignment is allowed to change. The tracking of which logical host the AP cluster is currently assigned to is kept in the APC Status Table.

Data Item Picture: X(3)

Size in Bytes: 3

Coding Type: Alpha

IDEFl XRef: EC 2

Data Item Stability: Static

Legal Value Set By:  
NTM Developers

Where Used: Message Header; APC Status Table; AP Information Table; Logon Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                       |
|---------------------|-----------------------------|---------------------------------------------------------------|
| Mon-VAX             | MRV                         | Monitor AP's APC on the VAX Supporting the Operator's Console |

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1 November 1985

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>       |
|---------------------|-----------------------------|-------------------------------|
| Mon-IBM             | MRI                         | Monitor AP's APC on the IBM   |
| Mon-HLS             | MHH                         | Monitor AP's APC on the HLS   |
| User-Int            | UIV                         | User Interface APC on the VAX |
| Comm-Hdler-VAX      | COV                         | VAX COM AP Cluster            |
| Comm-Hdler-IBM      | COI                         | IBM COM AP Cluster            |
| Comm-Hdler-HLS      | COH                         | HLS COM AP Cluster            |
| CDM                 | CDM                         | CDM APC                       |

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1 November 1985

Data Item Name: AP Cluster Status

Data Item ID: APCSTS

Data Item Description:

The AP Cluster status identifies the current operational status of a given cluster.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFI XRef: EC 2

Data Item Stability: Dynamic

Legal Value Set By:  
Monitor AP

Where Used: APC Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>              |
|---------------------|-----------------------------|--------------------------------------|
| Clus-Up             | 1                           | Cluster is up                        |
| Clus-Unavail        | 2                           | Cluster is not active                |
| Clus-Shutting-Down  | 3                           | Cluster is in Shutdown Mode          |
| Clus-In-Startup     | 4                           | Cluster is in Startup Mode           |
| Clus-Start-Flag     | 5                           | Cluster to be started on IIS startup |



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Data Item Name: Application Process Name      Data Item ID: APNAME

Data Item Description:

This data item identifies a unique "generic" Application Process known to the IISS. An AP is defined as a cohesive unit of software within the IISS that can be initiated as a unit to perform some function or functions. Each application process name is considered to be a Legal System Address.

The naming convention for AP names is to reserve the first two characters for the name of the subsystem to which the AP belongs. The second three characters will identify the specific process within the subsystem.

The AP name is the key portion of the message header source, destination, and originating source fields. It cannot, by itself, provide all the information needed to route messages and is therefore concatenated with Instance (when known) and resident AP Cluster.

Data Item Picture: X(8)\*

Size in Bytes: 8\*

Coding Type: Alpha/Numeric

Owner IDEF1 XRef: EC 17

Data Item Stability: Static

Legal Value Set By:  
Application Programme  
in accordance with IISS  
naming conventions\*

Where Used: AP Information Table; Message Header; AP Status Table; Child Table; AP Characteristics Table; Logon Table; AP Operating Information Table; I'm Alive Table; Authority Check Table NTH System Services

\*AP Naming conventions dictate an 8 Character base Name. To name a two character prefix to identify the directory where the AP's executable image is located is appended. This ten character name is the common reference to the AP throughout the NTH.

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1 November 1985

| <u>Legal Values</u>    | <u>Value Representation</u> | <u>Value Definition</u>                     |
|------------------------|-----------------------------|---------------------------------------------|
| Monitor AP             | NTMONITV                    | Monitor AP on the VAX host machine NTMONITI |
|                        | NTMONITH                    | Monitor AP on the Honeywell Level 6         |
| Communications Handler | COMVICOM                    | COMM linking the VAX to the IBM             |
|                        | COMVHCOM                    | COMM linking the VAX to the HL6             |
|                        | COMIVCOM                    | COMM linking the IBM to the VAX             |
|                        | COMIHCOM                    | COMM linking the IBM to the HL6             |
|                        | COMHVCOM                    | COMM linking the HL6 to the VAX             |
|                        | COMHICOM                    | COMM linking the HL6 to the IBM             |
| NPU-Mon-VAX            | NTMRVMPU                    | NPU serving the Monitor AP's APC on the VAX |
| NPU-Mon-IBM            | NTMRIMPU                    | NPU serving the Monitor AP's APC on the IBM |
| NPU-Mon-HL6            | NTMRHMPU                    | NPU serving the Monitor AP's APC on the HL6 |
| NPU-User-Int           | NTUIVMPU                    | NPU serving the User Interface APC          |
| NPU-COMM-Hdlr-VAX      | NTCOVMPU                    | NPU serving the COMM APC on the VAX         |
| NPU-COMM-Hdlr-IBM      | NTCOIMPU                    | NPU serving the COMM APC on the IBM         |

DS 620142000  
1 November 1985

| <u>Legal Values</u> | <u>Value<br/>Representation</u> | <u>Value Definition</u>                |
|---------------------|---------------------------------|----------------------------------------|
| MPU-COMM-Hdlr-HL6   | NTCOHMPU                        | MPU serving the COMM<br>APC on the HL6 |
| MPU-CDM             | NTCDHMPU                        | MPU serving the CDM APC                |

DS 620142000  
1 November 1985

Data Item Name: AP Cold Mailbox

Data Item ID: APCMBX

Data Item Description:

Identifies the low priority mailbox for a given instance of an application process.

Data Item Picture: X(14)

Size in Bytes: 14

Coding Type: Alpha/Numeric

IDEFl XRef: EC 47

Data Item Stability: Dynamic

Legal Value Set By:  
AP Interface

Where Used: Message Processing Unit

Representation:

|    |                 |                  |
|----|-----------------|------------------|
| 01 | AP-Cold-Mailbox |                  |
| 03 | AP-Name         | PIC X(10).       |
| 03 | AP-Instance     | PIC X(2).        |
| 03 | Mailbox-Type    | PIC X Value "C". |
| 03 | Filler          | PICK             |

DS 620142000  
1 November 1965

Data Item Name: AP ACK Mailbox

Data Item ID: APAMBX

Data Item Description:

Identifies the name of the mailbox to which  
acknowledgement messages are to be sent.

Data Item Picture: X(14)

Size in Bytes: 14

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 47

Data Item Stability: Dynamic

Legal Value Set By:  
AP Interface

Where Used: Message Processing Unit

Representation:

|    |                |                  |
|----|----------------|------------------|
| 01 | AP-ACK-Mailbox |                  |
| 03 | AP-Name        | PIC X(10).       |
| 03 | AP-Instance    | PIC X(2).        |
| 03 | Mailbox-Type   | PIC X Value "A". |
| 03 | Filler         | PICK             |

DS 620142000  
1 November 1985

Data Item Name: AP Not Mailbox

Data Item ID: APNMBX

Data Item Description:

Identifies the low priority mailbox for a given instance of an application process.

Data Item Picture: X(14)

Size in Bytes: 14

Coding Type: Alpha/Numeric

IDEFI XRef: EC 47

Data Item Stability: Dynamic

Legal Value Set By:  
AP Interface

Where Used: Message Processing Unit

Representation:

|    |                |                  |
|----|----------------|------------------|
| 01 | AP-Not-Mailbox |                  |
| 03 | AP-Name        | PIC X(10).       |
| 03 | AP-Instance    | PIC X(2).        |
| 03 | Mailbox-Type   | PIC X Value "N". |
| 03 | Filler         | PICK             |

DS 620142000  
1 November 1985

Data Item Name: AP Priority

Data Item ID: APPRC

Data Item Description:

The priority level assigned to a given Application Process.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static

Legal Value Set By:

Where Used: Message Header; AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
| Default             | 0<br>for the Test Bed       | Default AP Priority     |

DS 620142000  
1 November 1985

Data Item Name: Application Process Status    Data Item ID: APSTAT

Data Item Description:

This item defines the current operational status of a given initiated instance of an application process.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
AP's MPU

Note: All of these values are applied to an AP instance - Not to the "generic" AP

Where Used: AP Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                               |
|---------------------|-----------------------------|-----------------------------------------------------------------------|
| AP-Init             | 0                           | AP is in initiation mode ("I'm alive" msg has not yet arrived at MPU) |
| AP-Abort            | 1                           | AP has been aborted                                                   |
| AP-Dead-Act-Cld     | 2                           | AP has terminated but its child AP(s) are still active                |
| AP-Dead             | 3                           | AP has normally terminated                                            |
| Await-Init          |                             | AP is waiting for an initiation message                               |
| Init-Canc           | 5                           | AP's initiation was canceled                                          |
| Shut-Down-Mode      | 6                           | AP is in the process of shutting down                                 |



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1 November 1985

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                  |
|---------------------|-----------------------------|----------------------------------------------------------|
| In-Recovery         | 7                           | AP is in recovery mode                                   |
| In-Wait             | 8                           | AP is waiting on a response to a paired message          |
| Shut-Down           | 9                           | AP has completed shutdown and is dead                    |
| Recovered           | A                           | AP has finished recovery and is available for initiation |
| AP-Executing        | B                           | AP is executing                                          |

DS 620142000  
1 November 1985

Data Item Name: Authorization  
Requirement

Data Item ID: AUTREQ

Data Item Description:

The authorization requirement identifies whether a message conforming to a given category needs to have the authority of its sender, Message Type, and receiver checked.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 36

Data Item Stability: Static

Legal Value Set By:  
Message Category

Where Used: Message Category Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
| Aut-Yes             | 1                           | Authorize Message       |
| Aut-No              | 0                           | Don't Authorize Message |

DS 620142000  
1 November 1985

Data Item Name: Authorized to Receive      Data Item ID: ATOREC

Data Item Description:

This item is not a pure data item. It is the name of the field in the Authority Table that contains the AP Name that is authorized to receive a given message Type from an AP Name that is authorized to send the same given message type. The field name defines the function of the values that are contained in the field.

The values in the field are represented as the AP Name

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1 November 1985

Data Item Name: Authorized to Send

Data Item ID: ATOSND

Data Item Description:

This item (as Authorized to Receive) is a field name in the Authority Table which defines the function of the values that are contained in the field. The value in this field of the Authority Table is the AP Name that is authorized to send a given message type to another AP that is authorized to receive the same given message type.

The values in this field are AP Names and are represented as defined for the AP Name data item.

DS 620142000  
1 November 1985

Data Item Name: Binary/Native Flag

Data Item ID: BINNAT

Data Item Description:

Identifies the generic type of data contained in the data portion of a message. Binary indicates that the data is in the host machine's internal representation form whereas native indicates that the data is character data represented by the host machine's character code (ASCII, EBCDIC, etc.).

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
User (or default)

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                           |
|---------------------|-----------------------------|---------------------------------------------------|
| Binary              | B                           | Message is encoded in binary mode                 |
| Native              | N                           | Message is encoded in native mode (default value) |

DS 620142000  
1 November 1965

Data Item Name: Channel Range End

Data Item ID: CHANED

Data Item Description:

The highest Logical Channel ID in the range of ID's allocated to a user at logon. This item is represented as a logical channel ID. It's value is dynamic. It is used as a field in the Logon Table.

DS 020142000  
1 November 1985

Data Item Name: Child Rank

Data Item ID: RANK

Data Item Description:

A numeric ranking assigned to the child AP when its child table entry is created. The rank loosely correlates to the order in which the child AP's are spawned. The rank number is used in combination with the Parent AP Name as a link list pointer through the child Table.

Data Item Picture: 9(4)

Size in Bytes: 4

Coding Type: Numeric

IDEF1 XRef: EC 51

Data Item Stability: Dynamic

Legal Value Set By:  
User (or default)

Where Used: Child Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
|---------------------|-----------------------------|-------------------------|

0001-9999

DS 620142000  
1 November 1985

Data Item Name: Channel Range Start

Data Item ID: CHANST

Data Item Description:

The lowest Logical Channel ID in the range of ID's allocated to a user at Logon. This item is represented as a Logical Channel ID. It's value is dynamic. The item is used as a field in the Logon Table.



DS 620142000  
1 November 1985

Data Item Name: Child Status

Data Item ID: CLDSTS

Data Item Description:

This item defines the current operational status of a given child AP. The status values provided are only in terms of the child's relation to the Parent AP. The status of the child AP as an entity unto itself is provided in the AP Status Table.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: EC51

Data Item Stability: Dynamic

Legal Value Set By:  
Child AP's MPU

Where Used: Child Table

| <u>Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                                |
|---------------|-----------------------------|------------------------------------------------------------------------|
| Abort-ACK     | 1                           | Abort Message sent to child AP has been acknowledged                   |
| N-Term-No-Cld | 2                           | Child AP has normally terminated leaving no active children of its own |
| SD-APC        | 3                           | Child AP has been shutdown in APC SD Mode                              |
| SD-AP         | 4                           | Child AP has been shutdown in AP SD mode                               |
| SD-Host       | 5                           | Child AP has been shutdown in Host SD mode                             |
| CLD-Initiated | 6                           | Child AP has been initiated                                            |

DS 020142000  
1 November 1985

| <u>Legal Values</u>        | <u>Value<br/>Representation</u> | <u>Value Definition</u>                                           |
|----------------------------|---------------------------------|-------------------------------------------------------------------|
| Normal-Term-<br>With-Child | 7                               | Child AP has<br>normally<br>terminated leaving<br>active children |

DS 000142000  
1 November 1985

Data Item Name: Child Table Index

Data Item ID: CLDIND

Data Item Description:

This item exists in the AP Status Table to serve as an index to the given AP Instance's first entry in the child status table. It is a dynamic item whose values are determined when the Child Table entry is written. It is represented in COBOL as PIC 9(4).

DS 620142000  
1 November 1988

Data Item Name: Children

Data Item ID: CHILDRN

Data Item Description:

Identifies whether a given AP has any child AP's associated with it.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 51

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>         |
|---------------------|-----------------------------|---------------------------------|
| No-Kids             | 0                           | AP has no associated child AP's |
| Kids                | 1                           | AP has associated child AP's    |

DS 620142000  
1 November 1985

Data Item Name: Continuation Indicator      Data Item ID: CONIND

Data Item Description:

This item identifies whether a given message is part of a larger group of messages.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 19

Data Item Stability: Dynamic  
AP Interface

Legal Value Set By:

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                      |
|---------------------|-----------------------------|--------------------------------------------------------------|
| First Part          | 1                           | Message is the first part of a larger group and is continued |
| Not Continued       | 0                           | Message is complete within itself                            |
| Middle Part         | 2                           | Message is somewhere in the middle of a continued message.   |
| Last Part           | 3                           | Message is the last part of a continued message.             |

DS 620142000  
1 November 1985

Data Item Name: Data Code

Data Item ID: DATACD

Data Item Description:

This item is used in the I'M Alive Table to indicate whether there is data waiting to be delivered to the AP upon the MPU's receipt of the "I'm Alive" message. This item applies to messages that both cause an initiation to occur and carry data.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: N/A

Data Item "Stability": Dynamic

Legal Value Set By:  
Destination MPU

Where Used: I'm Alive Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                      |
|---------------------|-----------------------------|----------------------------------------------|
| No-Data             | 1                           | No data waiting                              |
| Data-Waiting        | 2                           | Data Waiting in buffer                       |
| Data-In-Next-Msg    | 3                           | Data Arguments are coming in another message |

DS 620142000  
1 November 1985

Data Item Name: Data Length

Data Item ID: DATLEN

Data Item Description:

This field exists in the message header to indicate the length of the actual data portion of the message.

Data Item Picture: X(4)

Size in Bytes: 4

Coding Type: Alpha/Numeric

IDEFl XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
Message Source AP

Where Used: Message Header

Value Range: 0000-9999

DS 680148000  
1 November 1985

Data Item Name: Delay Time Trigger

Data Item ID: TRGTIM

Data Item Description:

The trigger time represents the time value to be used in conjunction with a specified delay trigger condition.

Data Item Picture: X(18)

Size in Bytes: 18

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
Source AP or System  
Default

Where Used: Message Header

Representation: These in number of 100 ms increments.



Data Item Name: Delay Trigger

Data Item ID: DELTRG

Data Item Description:

The Delay Trigger indicates the condition under which the message is to be delivered.

Data Item Picture: I

Size in Bytes: 1

Coding Type: Alpha/Numeric

INFO Ref: BC 10

Data Item Stability: Dynamic

Legal Value Set By:  
Source AP or System  
Default

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                                   |
|---------------------|-----------------------------|---------------------------------------------------------------------------|
| Deferred Delay      | 1                           | Deliver any time after a specified time (see Delay Time Trigger)          |
| Conditional         | 2                           | Deliver upon a specified condition or event (see Delay Trigger condition) |
| Time-Triggered      | 3                           | Deliver at a specified time (see Delay Time Trigger)                      |
| Immediate           | 0                           | Deliver right now (system default)                                        |

DS 620142000  
1 November 1985

Data Item Name: Delay Trigger  
Condition

Data Item ID: TRGCON

Data Item Description:

The trigger condition specifies the actual condition under which a message is required to be delivered.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
Source AP or System  
Default

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
|---------------------|-----------------------------|-------------------------|

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INTEGRATED INFORMATION SUPPORT SYSTEM (IIS) VOLUME 6  
NETWORK TRANSACTION. (U) GENERAL ELECTRIC CO  
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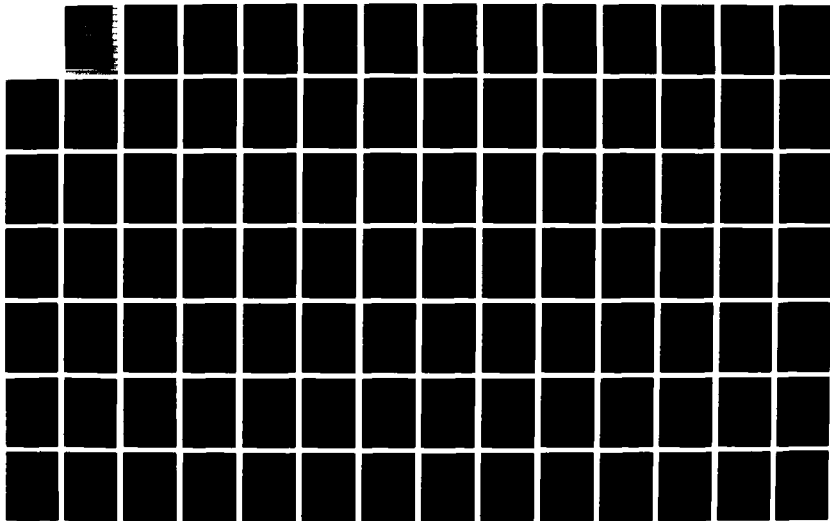
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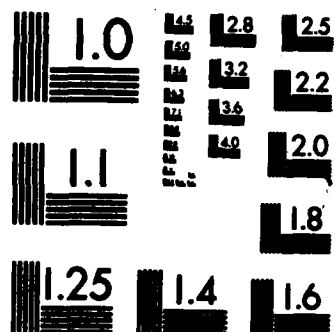
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

DS 620142000  
1 November 1985

Data Item Name: Guaranteed Delivery

Data Item ID: GUARDL

Data Item Description:

This item indicates whether a message conforming to a given category requires guaranteed delivery services. These services involve a concerted effort to insure the delivery of the message to its destination AP.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 36

Data Item Stability: Static

Legal Value Set By:  
Messag: Category

Where Used: Message Category Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>            |
|---------------------|-----------------------------|------------------------------------|
| GD                  | 1                           | Message Delivery is Guaranteed     |
| No-GD               | 0                           | Message Delivery is not Guaranteed |

DS 620142000  
1 November 1985

Data Item Name: Guaranteed Delivery Flag      Data Item ID: GDFLAG

Data Item Description:

This flag is set when the AP instance is the source of one or more guaranteed delivery messages that have yet to be delivered. Further data on these outstanding guaranteed delivery messages is maintained in the guaranteed delivery table.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
AP's MPU

Where Used: AP Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                            |
|---------------------|-----------------------------|--------------------------------------------------------------------|
| GD-Out              | 1                           | The AP instance has guaranteed messages outstanding-Flag is set    |
| No-GD               | 0                           | The AP instance has no gauranteed delivery messages - Flag not set |

DS 620142000  
1 November 1985

Data Item Name: Header Format  
Indicator

Data Item ID: HDRFMT

Data Item Description:

The header format ID identifies the particular format of the given message header. The value of this item has no relationship to the data portion of the message.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 19

Data Item Stability: Static

Legal Value Set By:  
NTM Developers

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
| A                   | A                           | Header Format A         |

DS 620142000  
1 November 1985

Data Item Name: Header Length

Data Item ID: HDRLEN

Data Item Description:

Specifies the length (in bytes) of the NTM header portion of the message.

Data Item Picture: X(3)

Size in Bytes: 3

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 19

Data Item Stability: Static

Legal Value Set By:  
NTM Developers

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>       |
|---------------------|-----------------------------|-------------------------------|
| A-092               | 092                         | The length of Header Format A |

Value Range: 001-999



DS 620142000  
1 November 1985

Data Item Name: Host Status

Data Item ID: HSTSTS

Data Item Description:

The host status identifies the current operational status of a given physical host machine.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 1

Data Item Stability: Dynamic

Legal Value Set By:  
NTM

Where Used: Host Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                    |
|---------------------|-----------------------------|--------------------------------------------|
| Up                  | 1                           | Machine is running                         |
| Down                | 0                           | Machine is dead                            |
| In-Start            | 2                           | Machine is being brought up                |
| In-Shutdown         | 3                           | Machine is in the process of shutting down |

DS 620142000  
1 November 1985

Data Item Name: Initiation Needs

Data Item ID: ININDS

Data Item Description:

Defines whether a given AP requires a specific initiation message (Category H) in order to be started.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: EC17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                |
|---------------------|-----------------------------|--------------------------------------------------------|
| No-Restric          | 0                           | AP can be initiated by any message                     |
| Needs-Init-Msg      | 1                           | AP requires specific initiation message                |
| Start-From-Term     | 2                           | AP is initiated from a terminal-not started by the NTM |

DS 620142000  
1 November 1985

Data Item Name: Instance

Data Item ID: INSTNC

Data Item Description:

An identifier assigned to every instance (initiated occurrence) of a given AP. The instance serves to uniquely identify one initiated (awake) AP. In the case of the User Interface AP, the instance will map to a specific terminal (or screen, in multiscreen mode). The instance identifier is associated with an AP from its initiation until the AP and its associated instances are cleaned up.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Status Table; Message Header; I'm Alive Table

Value Range: 01-99

DS 620142000  
1 November 1985

Data Item Name: Instances Currently  
Running

Data Item ID: NUMINS

Data Item Description:

This data item identifies the number of instances of a  
given AP which are currently in some stage of operation.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Operating Information Table

Value Range: 00-36

DS 620142000  
1 November 1985

Data Item Name: Integrity Check Flag

Data Item ID: INTCHK

Data Item Description:

Indicates whether the data portion of a given message should be validated against the data format specified in the message header.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
Source AP or System  
Default

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                          |
|---------------------|-----------------------------|--------------------------------------------------|
| Check               | 1                           | Data portion is to be checked for data integrity |
| No-Check            | 0                           | Data portion is not to be checked                |

DS 620142000  
1 November 1985

Data Item Name: Last Instance Number  
Assigned

Data Item ID: LSTINS

Data Item Description:

This item provides the value of the last instance number  
assigned to an instance of a given AP.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Dynamic

Legal Value Set By:  
MPU

Where Used: AP Operating Information Table

Value Range: 01-99

DS 620142000  
1 November 1985

Data Item Name: Last Key Pointer

Data Item ID: LSTKEY

Data Item Description:

Pointer to the last key value assigned for a given AP for  
messages queued in the AP queue.

Data Item Picture: X(9)

Size in Bytes: 9

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
MPU

Where Used: AP Status Table

DS 620142000  
1 November 1985

Data Item Name: Link ID

Data Item ID: LINKID

Data Item Description:

The identification of a specific communications link between two physical host machines. The link is maintained by "sibling" COMM AP's.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEFl XRef: EC 48

Data Item Stability: Static

Legal Value Set By:  
NTM Developers

Where Used: Link Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                               |
|---------------------|-----------------------------|-------------------------------------------------------|
| VAX-IBM             | VI                          | Link between the VAX 11/780 and the IBM 3033          |
| IBM-HL6             | IH                          | Link between the IBM 3033 and the Honeywell Level 6   |
| VAX-HL6             | VH                          | Link between the VAX 11/780 and the Honeywell Level 6 |



DS 620142000  
1 November 1985

Data Item Name: Link Status

Data Item ID: LKLSTAT

Data Item Description:

The current operational status of a given link.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: EC48

Data Item Stability: Dynamic

Legal Value Set By:  
VAX Monitor AP

Where Used: Link Status Table

| <u>Legal Values</u> | <u>Value Representation</u>         | <u>Value Definition</u> |
|---------------------|-------------------------------------|-------------------------|
| Active              | 1                                   | Link is Active          |
| Inactive            | 0                                   | Link has failed         |
| Started             | 2<br>has been sent-no<br>return yet | Start Link message      |

DS 620142000  
1 November 1985

Data Item Name: Log Requirement

Data Item ID: LOGREQ

Data Item Description:

The log requirement identifies whether a message is to be logged based upon the given message category. In the Test Bed all messages will be logged. For future releases, logging will be restricted to certain message categories in accordance with the requirements defined by the recovery function.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 36

Data Item Stability: Static

Legal Value Set By:  
Message Category

Where Used: Message Category Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
| Yes                 | 1                           | Log the Message         |
| No                  | 0<br>message                | Don't log the           |

Data Item Name: Logical Channel ID

Data Item ID: CHANID

Data Item Description:

This item identifies a logical connection between two or more awake APs. This connection is established in two cases. The first case involves the maintenance of a "family tree" of AP instances. The second case serves to identify a unique pair of messages.

Data Item Picture: X(3)

Size in Bytes: 3

Coding Type: Alpha/Numeric

IDEFl XRef: EC 50

Data Item Stability: Dynamic

Legal Value Set By:  
Original Source AP  
AP Interface (for  
default)

Where Used: Message Header; Message Pairing Table; AP Status Table; Child Status Table.

Representation: Any combination of 3 Alpha or Numeric characters.

DS 620142000  
1 November 1985

Data Item Name: Logical Host Name

Data Item ID: HSTNAM

Data Item Description:

Host name identifies an instance of a logical host within a physical host machine on the IISS. The logical host has a number of AP Clusters assigned to it.

Data Item Picture: X(3)

Size in Bytes: 3

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 41

Data Item Stability: Static

Legal Value Set By:

Where Used: Host Status Table; AP Cluster Status Table

DS 620142000  
1 November 1985

Data Item Name: Maximum Instances

Data Item ID: MAXINS

Data Item Description:

This item defines the maximum number of instances of a given AP that can be initiated at any given time.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 17

Data Item Stability: Static

Legal Value Set By:

Where Used: AP Characteristics Table

DS 620142000  
1 November 1985

Data Item Name: Maximum Number of  
Queued Messages

Data Item ID: NOAMSG

Data Item Description:

This item identifies the maximum number of messages that are allowed to be in a given (generic) AP's queue at any one time.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEF1 X Ref.: EC17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

Value Range: 00-99

DS 620142000  
1 November 1985

Data Item Name: Message Category

Data Item ID: MSGCAT

Data Item Description:

The message category defines processing required by the message. The category implies the level of processing needed to establish the overall acceptability of the message. It also specifies certain special services the NTM is required to provide.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha

IDEFl XRef: EC 36

Data Item Stability: Static  
NTM Developers

Legal Value Set By:

Where Used: Message Header; Message Category Table

| <u>Legal Values</u>  | <u>Value Representation</u> | <u>Value Definition</u>                                        |
|----------------------|-----------------------------|----------------------------------------------------------------|
| Guar-Del             | A                           | Message requires a Guaranteed Delivery Service                 |
| Resp-Reqd            | B                           | Response Required                                              |
| SysCmd-No Resp       | C                           | System Command - No Response Required                          |
| Syscmd-Resp          | D                           | System Command - Response Required                             |
| Unsol-Msg            | E                           | Unsolicited Message                                            |
| Sol-Msg              | F                           | Solicited Message                                              |
| ApStatus-Msg         | G                           | AP Status Message                                              |
| Init-Msg-No-Response | H                           | Message specifically requires the initiation of an AP Instance |

DS 620142000  
1 November 1985

| <u>Legal Values</u>            | <u>Value<br/>Representation</u> | <u>Value Definition</u>                      |
|--------------------------------|---------------------------------|----------------------------------------------|
| Msg-From-COMM                  | I                               | Message having a<br>COMM AP as its<br>source |
| Init-Msg-Response-<br>Required | J                               | Paired Specific<br>initiation<br>message     |



DS 620142000  
1 November 1985

Data Item Name: Message Destination

Data Item ID: MSGDST

Data Item Description:

The Application Process that is the receiver of the given message. The destination is defined as the combination of the receiving AP name, instance (if known), and resident AP Cluster. It is represented in the message header as:

10 HDR MSGDST  
15 MD APNAME X(10)  
15 MD INSTNC X(2)  
15 MD APCNME X(3)

This item is used in the Guaranteed Delivery table to identify the destination of a given GD message.

DS 620142000  
1 November 1985

Data Item Name: Message Log Time Stamp      Data Item ID: TSTAMP

Data Item Description:

The host system clock time at the occurrence of a particular event.

Data Item Picture: X(23)

Size in Bytes: 23

Coding Type: Alpha/Numeric

IDEFl XRef: N/A

Data Item Stability: Dynamic

Legal Value Set By:  
Host OS

Where Used: Message and Error Log

DS 620142000  
1 November 1985

Data Item Name: Message Priority

Data Item ID: MSGPRY

Data Item Description:

The priority code identifies the processing priority assigned to a message conforming to a given message category.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 36

Data Item Stability: Static

Legal Value Set By:  
Message Category

Where Used: Message Header; Message Category Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>   |
|---------------------|-----------------------------|---------------------------|
| Hot                 | 1                           | Message has high priority |
| Cold                | 0                           | Message has low priority  |

DS 620142000  
1 November 1985

Data Item Name: Message Queue Flag

Data Item ID: MSGQUF

Data Item Description:

This item is a flag that is set when there are messages in queue waiting for a specified AP Instance.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                           |
|---------------------|-----------------------------|-------------------------------------------------------------------|
| Msg-In              | 1                           | There are messages in the queue for the AP Instance - Flag is set |
| No-Msg              | 0                           | There are no messages in the queue - No flag                      |

DS 620142000  
1 November 1985

Data Item Name: Message in Queue

Data Item ID: NMSG

Data Item Description:

Identifies the number of messages currently queued for a given AP instance.

Data Item Picture: X(4)

Size in Bytes: 4

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Status Table

DS 620142000  
1 November 1985

Data Item Name: Message Serial Number      Data Item ID: MSGSN

Data Item Description:

A number that is assigned to each message by its source MPU AP Cluster. The number itself is unique only within an AP Cluster. In order for the message to be uniquely identifiable within the IISS, the serial number is concatenated with the source AP Cluster name.

Data Item Picture: X(7)

Size in Bytes: 7

Coding Type: Alpha/Numeric

IDEFl XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
Source MPU

Where Used: Message Header; Guaranteed Delivery Table

DS 620142000  
1 November 1985

Data Item Name: Message Serial Number  
Last Queued

Data Item ID: SERNLQ

Data Item Description:

The serial number and source AP Cluster of the last message written to the message queue for a given AP instance. The value representation is taken from the header of the message.

This data item is maintained for recovery processing purposes.

Data Item Picture: X(10)

Size in Bytes: 10

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Status Table

DS 620142000  
1 November 1985

Data Item Name: Message Source

Data Item ID: MSGSRC

Data Item Description:

The Application Process that is the immediate sender of a given message. The source is defined as the combination of the sending AP's name, instance, and resident AP Cluster. It is represented in the message header as:

```
10 HDR MSGSRC
  15 MS APNAME PIC X(10)
  15 MS INSTNC PIC X(2)
  15 MS APCNME PIC X(3)
```

This item is used in the Guaranteed Delivery table to identify the source of the given GD message.



DS 620142000  
1 November 1985

Data Item Name: Message Type

Data Item ID: MSGTYP

Data Item Description:

The message type represents the nature of a given message. It is used for authorization purposes where the type is matched to a specified path (source to destination). The message type is also used to specify the format of the data portion of the message.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha

IDEFl X Ref.: EC5

Data Item Stability: Static

Legal Value Set By:  
Message Source AP

Where Used: Message Header; Authority Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
|---------------------|-----------------------------|-------------------------|

See Appendix E for the definition of Message Types within the NTM.

Data Item Name: Number of Mailboxes

Data Item ID: NUMMBX

Data Item Description:

Defines the number of mailboxes a given AP will support. An AP that needs no input will not support any mailboxes. AP's that accept input will support either one mailbox or two. The second mailbox is used by AP's having the capability of receiving unsolicited messages.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: EC17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                                                                            |
|---------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------|
| No-MBX              | 0                           | AP has no mailboxes                                                                                                |
| One-MBX             | 1                           | AP supports one mailbox (and a small "ACK" mailbox)                                                                |
| Two-MBX             | 2                           | AP supports two mailboxes and is able to receive unsolicited messages (the AP also supports a small "ACK" mailbox) |

DS 620142000  
1 November 1985

Data Item Name: Number of Messages

Data Item ID: NUMMSG

Data Item Description:

This item value provides the number of messages in queue waiting for a given generic Application Process (not instance).

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Dynamic  
Local MPU

Legal Value Set By:

Where Used: AP Operating Information Table

DS 620142000  
1 November 1985

Data Item Name: Number of Parents  
Per Instance

Data Item ID: NOPINS

Data Item Description:

Defines the number of "Parents" a given AP instance may have at any one time. This item distinguishes between a single instance type of AP (one parent per instance) and a queue server type of AP (multiple parents per instance). In the case of a queue server this item also serves to define the maximum number of sources that can be connected to it at any one time.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEF1 X Ref.: EC17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

Value Range: 01-99

DS 620142000  
1 November 1985

Data Item Name: Number of Tries

Data Item ID: NTRIES

Data Item Description:

Identifies the number of times an entry in the I'm Alive table has been checked. After a given number of checks without receiving an I'm Alive message from the AP, it must be assumed that the AP is in trouble. The MPU will then take appropriate action.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: N/A

Data Item Stability: Dynamic

Legal Value Set By:  
NTM Developers

Where Used: I'm Alive Table

DS 620142000  
1 November 1985

Data Item Name: On Abort

Data Item ID: ONABT

Data Item Description:

This item defines how a given generic AP is to be handled when an abort message arrives for it.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static  
AP Developer

Legal Value Set By:

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                    |
|---------------------|-----------------------------|--------------------------------------------|
| Run-Comp            | 1                           | Run to completion                          |
| Send-Abort          | 2                           | Forward the abort message to the AP.       |
| Ab-Term             | 3                           | Abnormally terminate the AP via an OS Call |

DS 620142000  
1 November 1985

Data Item Name: On-Child Abnormal  
Termination

Data Item ID:  
ONCLDA

Data Item Description:

This item is used to indicate whether a given AP requires a status message upon the abnormal termination (abort) of one of its child AP's. It further indicates whether the given AP is to be abnormally terminated itself upon a child abort.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                     |
|---------------------|-----------------------------|---------------------------------------------|
| No-Send-Msg         | 0                           | No message to AP-MPU status message only    |
| Send-Msg            | 1                           | AP wants child abnormal termination message |
| Abort               | 2                           | Abort Parent on Child Abort                 |

DS 620142000  
1 November 1985

Data Item Name: On-Child Normal  
Termination

Data Item ID: ONCLDT

Data Item Description:

This item is used to indicate whether a given AP requires a status message upon the normal termination of one of its child AP's. It further indicates whether the given AP should be terminated itself upon its child normal termination.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                          |
|---------------------|-----------------------------|--------------------------------------------------|
| No-Msg only         | 0                           | No message to AP-MPU                             |
| Req Msg termination | 1                           | AP wants child message                           |
| Kill-Parent         | 2                           | Terminate Parent upon Child's normal termination |



DS 620142000  
1 November 1985

Data Item Name: On-Child Shutdown

Data Item ID: ONCLDS

Data Item Description:

Indicates whether a given AP requires a status message upon the shutdown of one of it's child AP's. It further indicates whether the Parent AP should abort upon the Child AP shutdown.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>               |
|---------------------|-----------------------------|---------------------------------------|
| Msg-No              | 0                           | No message to Parent AP               |
| Msg-Yes             | 1                           | Parent AP wants a message             |
| Abort-Parent        | 2                           | Abort the Parent on Child AP Shutdown |

DS 620142000  
1 November 1985

Data Item Name: On-Recovery

Data Item ID: ONREC

Data Item Description:

Indicates whether a given AP contains the internal logic to process startup in a recovery mode as well as in an initiate mode.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u>        | <u>Value Representation</u> | <u>Value Definition</u>              |
|----------------------------|-----------------------------|--------------------------------------|
| Can-Handle<br>own Recovery | 1                           | AP can handle its                    |
| Can't-Handle               | 0                           | AP cannot handle its<br>own Recovery |

DS 620142000  
1 November 1985

Data Item Name: On Shutdown

Data Item ID: ONSTDN

Data Item Description:

Indicates whether the given AP contains internal logic to process a shutdown message from the NTM.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u>       | <u>Value Representation</u> | <u>Value Definition</u>                                                                                                                |
|---------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Has-Logic<br>own shutdown | 1                           | AP can handle its                                                                                                                      |
| No-Logic                  | 0                           | AP cannot handle its<br>own shutdown                                                                                                   |
| Run-to-Comp               | 2                           | AP is shutdown from<br>a source other than<br>the MPU - it should<br>not be sent a<br>shutdown message<br>nor should it be<br>aborted. |

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Data Item Name: Original Source AP

Data Item ID: ORGSRC

Data Item Description:

The original source of the message that initiated the "head" AP of a given tree of AP's. The source is identified by its AP Name, Instance, and resident AP Cluster. Its value representation is taken from the Message Source Header field of the original message.

Data Item Picture: X(15)

Size in Bytes: 15

Coding Type: Alpha/Numeric

IDEFl XRef: EC 42

Data Item Stability: Dynamic

Legal Value Set By:  
MPU

Where Used: Message Header; AP Status Table; Message Pairing Table

Representation:

|    |                          |           |
|----|--------------------------|-----------|
| 01 | Original-Source          |           |
| 03 | Original-Source-AP       | PICX(10). |
| 03 | Original-Source-Instance | PICX(2).  |
| 03 | Original-Source-APC      | PICX(3).  |

DS 620142000  
1 November 1985

Data Item Name: Pair Flag

Data Item ID: PRFLAG

Data Item Description:

The pair flag is set when a given AP Instance has one or more outstanding waits on paired messages.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
Local MPU

Where Used: AP Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                     |
|---------------------|-----------------------------|-------------------------------------------------------------|
| Pair-Set            | 1                           | AP Instance has one or more outstanding waits - Flag is set |
| No-Pair             | 0                           | AP Instance has no paired messages - Flag not set           |

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Data Item Name: Pairing Requirement

Data Item ID: PREQMT

Data Item Description:

The pairing requirement indicates whether the message conforming to a given category will require pairing services. These services involve creating an entry into the Message Pair Table, tracking timeouts on a pair, and matching the response message to its request.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 36

Data Item Stability: Static

Legal Value Set By:  
Message Category

Where Used: Message Category Table

| <u>Legal Values</u> | <u>Value<br/>Representation</u> | <u>Value Definition</u>             |
|---------------------|---------------------------------|-------------------------------------|
| Pair                | 1                               | Message requires<br>pairing         |
| No-Pair             | 0                               | Message does not<br>require pairing |

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Data Item Name: Physical Host Name

Data Item ID: PHYHST

Data Item Description:

A physical host machine is an actual instance of a computer. The physical host is referenced as one or more logical host(s) (see Logical Host Name).

Data Item Picture: X(3)

Size in Bytes: 3

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 1

Data Item Stability: Static

Legal Value Set By:  
Host Vendor

Where Used: Host Status Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
| VAX                 | VAX                         | VAX 11/780              |
| IBM                 | IBM                         | IBM 3033                |
| HL6                 | HL6                         | Honeywell Level 6       |

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Data Item Name: Process Name

Data Item ID: PRONME

Data Item Description:

The name and instance identifier of an alive AP.

Data Item Picture: X(12)

Size in Bytes: 12

Coding Type: Alpha/Numeric

IDEF1 X Ref.: EC 16

Data Item Stability: Dynamic

Legal Value Set By:  
AP Interface

Where Used: Message Header, AP Status Table, I'm Alive Table

Representation:

|    |              |           |
|----|--------------|-----------|
| 01 | Process-Name |           |
| 03 | AP-Name      | PICX(10). |
| 03 | AP-Instance  | PICX(2).  |



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Data Item Name: Processing Code

Data Item ID: PROCDE

Data Item Description:

When a message is accepted by an MPU, an accept message. (Message Manager ACK-type MA) is sent to the message source AP. In the data portion of this message, the entire header of the accepted message is returned. The AP Interface may retain this header for use on future identical messages. Where the header is reused, the AP Interface sets the Processing Code field value in the header to "1" (used). The MPU can then bypass the normal data integrity checks on the message header.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: N/A

Data Item Stability: Dynamic  
AP Interface

Legal Value Set By:

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                          |
|---------------------|-----------------------------|------------------------------------------------------------------|
| Used                | 1                           | Message header has been used previously and is acceptable        |
| New                 | 0                           | Message header has never been checked by the MPU (default value) |

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Data Item Name: Pseudo Instance

Data Item ID: PINSTNC

Data Item Description:

An identifier assigned to each "connection" of a Queue Server AP requiring message chaining. In effect this item identifies an instance within an instance for those AP's that deal with multiple "Parents" concurrently.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: 53

Data Item Stability: Dynamic

Legal Value Set By:

Where Used: Connection Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u> |
|---------------------|-----------------------------|-------------------------|
|                     | 0-2                         |                         |

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Data Item Name: Queue Server Type

Data Item ID: ASTYPE

Data Item Description:

Identifies the chaining support required by the AP.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: 17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Information Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                                        |
|---------------------|-----------------------------|----------------------------------------------------------------|
| No Chain            |                             | The AP requires no chaining support.                           |
| Child-Chain         |                             | The NTM will build a child AP chain of any AP's spawned.       |
| Message-Chain       |                             | The NTM will build a message or "connection" chain for the AP. |

Note: Design not completed for Release 2.0.

DS 620142000  
1 November 1985

Data Item Name: Role Name

Data Item ID: ROLENM

Data Item Description:

The role name identifies a generic class of human users within the IISS. Each user on the system may be assigned to one or more roles.

Data Item Picture: X(10)

Size in Bytes: 10

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 12

Data Item Stability: Static

Legal Value Set By:  
Subsystem Developer

Where Used: Logon Table

DS 620142000  
1 November 1985

Data Item Name: Session Start Time

Data Item ID: STRTME

Data Item Description:

The system clock time when an IISS user's logon request was accepted.

Data Item Picture: X(23)

Size in Bytes: 23

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 12

Data Item Stability: Dynamic

Legal Value Set By:  
UI

Where Used: Logon Table

DS 620142000  
1 November 1985

Data Item Name: Statistics Collection      Data Item ID: STATCO  
Flag

Data Item Description:  
The statistics collection flag indicates whether certain statistical data is to be collected on the given message.

Data Item Picture: X      Size in Bytes: 1

Coding Type: Alpha/Numeric      IDEFl XRef: EC 36

Data Item Stability: Static      Legal Value Set By:  
Message Category

Where Used: Message Header; Message Category Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                  |
|---------------------|-----------------------------|------------------------------------------|
| Collect             | 1                           | Collect statistics on this message       |
| No-Collect          | 0                           | Don't collect statistics on this message |

DS 620142000  
1 November 1985

Data Item Name: Terminal ID

Data Item ID: TERMID

Data Item Description:

A physical instance of a computer terminal on the IISS.

Data Item Picture: X(2)

Size in Bytes: 2

Coding Type: Alpha/Numeric

IDEFl XRef: EC 7

Data Item Stability: Static

Legal Value Set By:  
UI

Where Used: Logon Table

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1 November 1985

Data Item Name: Test Flag

Data Item ID: TSTFLG

Data Item Description:

This flag exists in the message header to indicate whether the source AP of the given message is operating in test mode. This flag serves as a warning to the destination AP to process the message accordingly (i.e., no update processing on a message with the test flag set to "1").

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl XRef: EC 19

Data Item Stability: Dynamic

Legal Value Set By:  
Source AP or System  
Default

Where Used: Message Header

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>               |
|---------------------|-----------------------------|---------------------------------------|
| In-Test             | 1                           | Source AP is operating in test mode   |
| No-Test             | 0                           | Source AP is operating in normal mode |



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Data Item Name: Timeout Handling

Data Item ID: TMOHDL

Data Item Description:

Identifies how a given AP is to be handled in the event that a timeout on a paired message expires before the reply message arrives.

Data Item Picture: X

Size in Bytes: 1

Coding Type: Alpha/Numeric

IDEFl X Ref.: EC17

Data Item Stability: Static

Legal Value Set By:  
AP Developer

Where Used: AP Characteristics Table

| <u>Legal Values</u> | <u>Value Representation</u> | <u>Value Definition</u>                              |
|---------------------|-----------------------------|------------------------------------------------------|
| No-Can-do-Pairs     | 0                           | AP does not send Paired Messages                     |
| Cancel-Pair         | 1                           | Delete entry in Pair Table                           |
| Abort-on-Timeout    | 2                           | Abort AP when timeout expires before reply arrives   |
| No-Cancel-Pair      | 3                           | Set another timeout and maintain entry in pair table |

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1 November 1985

Data Item Name: Timeout Time

Data Item ID: TMOUTH

Data Item Description:

This item represents the system clock time when the timeout on a given message pair is to expire.

Data Item Picture: X(23)

Size in Bytes: 23

Coding Type: Alpha/Numeric

IDEF1 XRef: N/A

Data Item Stability: Dynamic

Legal Value Set By:  
Source MPU

Where Used: Message Pairing Table

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Data Item Name: Time Stamp When  
Accepted

Data Item ID: TSMPA

Data Item Description:

This item is used in the Guaranteed Delivery Table to identify the time that a GD message was accepted by its source MPU. The value of this item provides the base for determining the "age" of the message. The value is represented as system clock time, COBOL PIC X(23).

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Data Item Name: User Name

Data Item ID: USRNAM

Data Item Description:

The name associated with a given human user of the IISS  
who is currently logged on to the system.

Data Item Picture: X(8)

Size in Bytes: 8

Coding Type: Alpha/Numeric

IDEF1 XRef: EC 12

Data Item Stability: Static

Legal Value Set By:  
IISS System  
Administrator

Where Used: Logon Table

## APPENDIX E

### MESSAGE TYPES

This section defines the various types of messages that the NTM will be handling in the IISS Test Bed. Each type is defined as to its nature and implied processing. In addition, the header values and data portion content for each type is provided.

Certain message types have been "canned" to facilitate their creation and delivery, particularly when an error condition occurs. These messages are indicated by an asterisk (\*).

Table E-1 is an overview of all of the message types in terms of their name, code ID, category, path, and next immediate message (where applicable).

Table E-2 provides a review of the message categories along with relevant processing performed by the MPU when it receives a message conforming to the given type.

The message type description are provided in alphabetical order for ease of access.

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TABLE E-1  
MESSAGE TYPE OVERVIEW

|                                      | <u>Type</u> | <u>Category</u> | <u>Path</u>                                     | <u>"Next Msg"</u>        |
|--------------------------------------|-------------|-----------------|-------------------------------------------------|--------------------------|
| 1. Abort AP                          | AB          | C               | "Parent" MPU-Child MPU<br>Parent AP - Child MPU | AP Dying                 |
| 2. Active List                       | AA          | F               | MPU - Monitor                                   | (Opt.) Operator<br>Abort |
| 3. AP Already<br>Dead                | AM          | G               | MPU - Monitor                                   | N/A                      |
| 4. AP Alive                          | AL          | G               | AP - Local MPU                                  | System State             |
| 5. AP Dying                          | AD          | G               | AP - Local MPU                                  | (Opt.) Abort<br>AP       |
| 6. AP Ending                         | AE          | E               | MPU - AP                                        | N/A                      |
| 7. AP Init at SD NL                  |             | G               | MPU - Monitor AP                                | N/A                      |
| 8. AP Interface<br>Error*            | 32          | E               | MPU - Monitor AP                                | N/A                      |
| 9. AP Status<br>Request              | SR          | B               | Any AP - Any MPU                                | AP Status Return         |
| 10. AP Status<br>Return              | IS          | F               | MPU - Requesting AP                             | N/A                      |
| 11. APC Alive*                       | LV          | E               | MPU - Monitor AP                                | Global Table<br>Update   |
| 12. APC Availa-<br>bility<br>Request | AV          | D               | AP - Local MPU                                  | APC Available<br>Return  |
| 13. APC Available<br>Return          | VR          | F               | Local MPU - AP                                  | N/A                      |

**TABLE E-1**  
**MESSAGE TYPE OVERVIEW (Continued)**

|                        | <u>Type</u> | <u>Category</u> | <u>Path</u>                    | <u>"Next Msg"</u>                  |
|------------------------|-------------|-----------------|--------------------------------|------------------------------------|
| 14. APC Name Request   | AN          | D               | AP - MPU                       | APC Name Return                    |
| 15. APC Name Return    | NA          | F               | MPU - AP                       |                                    |
| 16. APC Status Request | PS          | D               | AP - Local MPU                 | APC Status Return                  |
| 17. APC Status Return  | PR          | F               | Local MPU - AP                 | N/A                                |
| 18. APC Terminated     | CT          | E               | MPU - Monitor AP               | N/A                                |
| 19. Cancel Shutdown    | CS          | C               | Monitor AP - UI AP             | N/A                                |
| 20. Change Role        |             |                 |                                |                                    |
| 21. Child AP Status    | CD          | E               | Child APs MPU - Parent APs MPU | (On Child Tree Completion) Cleanup |
| 22. Get User Request   | UX          | E               | AP-Monitor                     | Get User Response                  |
| 23. Get User Response  | XU          | E               | Monitor - AP                   | N/A                                |
| 24. Cleanup            | CL          | C               | Parent APs MPU - Child APs MPU | N/A                                |
| 25. GD ACK             | GA          | C               | Dest. MPU - Source MPU         | N/A                                |
| 26. GD Status Request  | GS          | D               | AP - Local MPU                 | GD Status Return                   |
| 27. GD Status          | GR          | F               | Local MPU - AP                 | N/A                                |

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**Return**

|                          |    |   |                             |                  |
|--------------------------|----|---|-----------------------------|------------------|
| 28. Host<br>Active       | HU | C | Monitor AP -<br>Local MPU's | N/A              |
| 29. Host A-<br>vailable  | HA | E | Monitor AP -<br>Monitor AP  | N/A              |
| 30. Host Name<br>Request | HN | C | AP - Local MPU              | Host Name Return |



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TABLE E-1

MESSAGE TYPE OVERVIEW (Continued)

|                           | <u>Type</u> | <u>Category</u> | <u>Path</u>                        | <u>"Next Msg"</u>    |
|---------------------------|-------------|-----------------|------------------------------------|----------------------|
| 31. Host Name Return      | NH          | E               | Local MPU - AP                     | N/A                  |
| 32. Host Status Request   | HR          | D               | AP - Local MPU                     | Host Return          |
| 33. Host Status           | HO          | F               | Local MPU - AP                     | N/A                  |
| 34. Host Terminating      | HT          | F               | Monitor AP - Monitor AP            | Update Host Table    |
| 35. Initiate Comm         | AP          | CI              | Monitor AP - Comm AP               | N/A                  |
| 36. Link Active           | LA          | I               | Comm AP to                         | Host Alive           |
| 37. Link Fail             | LF          | I               | Monitor AP<br>Comm AP - Monitor AP | (Opt.) Shutdown APCs |
| 38. List Request          | LR          | D               | Monitor AP - MPU                   | Active List          |
| 39. Logoff                | OF          | E               | UI to Monitor AP                   | N/A                  |
| 40. Logon Request         | LO          | E               | UI AP - Monitor AP                 | Logon Response       |
| 41. Logon Response        | LX          | E               | Monitor AP-UI AP                   | N/A                  |
| 42. Message After Timeout | MT          | E               | MPU - Monitor AP                   | N/A                  |
| 43. Message Mgr. ACK*     | MA          | E               | Local MPU -<br>Msg. Source AP      | N/A                  |

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TABLE E-1

MESSAGE TYPE OVERVIEW (Continued)

|                                             | <u>Type</u> | <u>Category</u> | <u>Path</u>                                | <u>"Next Msg"</u>                     |
|---------------------------------------------|-------------|-----------------|--------------------------------------------|---------------------------------------|
| 44. Message<br>No Accept*                   | SA          | E               | Local MPU - Source<br>AP                   | N/A                                   |
| 45. Message<br>for Un-<br>available<br>APC* | MQ          | E               | MPU - Monitor                              | Queued Start APC<br>(Operator Option) |
| 46. Message<br>Receive<br>ACK               | RA          | F               | AP - AP                                    | N/A                                   |
| 47. Off-Host<br>Shutting<br>Down            | HS          | C               | Monitor AP - MPU                           | N/A                                   |
| 48. Operator<br>Abort                       | OA          | C               | Monitor AP - MPU                           | AP Dying -Or-Proc.<br>Name Not Found  |
| 49. Paired<br>Message<br>Status<br>Request  | MS          | D               | AP - Local MPU                             | Paired Message<br>Status Return       |
| 50. Paired<br>Message<br>Status<br>Return   | MR          | F               | Local MPU - AP                             | N/A                                   |
| 51. Process<br>Name Not<br>Found            | NP          | E               | MPU - Monitor AP                           | N/A                                   |
| 52. Proces-*<br>sing Error*                 | 31          | E               | MPU - Monitor AP                           | N/A                                   |
| 53. Rebuild<br>Tables                       | RT          | D               | Monitor - MPU<br>Request Tables<br>Rebuilt | Table Data                            |

TABLE E-1

MESSAGE TYPE OVERVIEW (Continued)

|                           | <u>Type</u> | <u>Category</u> | <u>Path</u>                   | <u>"Next Msg"</u>        |
|---------------------------|-------------|-----------------|-------------------------------|--------------------------|
| 54. Recoverable Error     | RE          | E               | AP - Monitor AP               | N/A                      |
| 55. Resource Unavailable* | 33          | E               | MPU - Monitor                 | N/A                      |
| 56. Shutdown AP           | DA          | C               | Monitor AP - MPU<br>MPU - MPU | AP Dying                 |
| 57. Shutdown AP Cluster   | DC          | D               | Monitor AP - MPU              | Soft Shutdown (opt.)     |
| 58. Shutdown Comm AP      | TR          | E               | Monitor AP - Comm AP          | AP Dying                 |
| 59. Shutdown Host         | SH          | B               | Monitor AP - Monitor          | AP Shutdown APC          |
| 60. Shutdown Link         | SD          | B               | Monitor AP - Comm AP          | N/A                      |
| 61. Shutdown Pending      | SP          | C               | Monitor AP - UI AP            | N/A                      |
| 62. Signal Error          | SE          | E               | MPU - AP                      | N/A                      |
| 63. Soft Shutdown         | SD          | C               | Local MPU - AP                | AP Dying                 |
| 64. Start Link            | L           | B               | Monitor AP - Comm AP          | Link Active or Link Fail |
| 65. Start MPU             | SC          | C               | Monitor AP - Monitor's MPU    | N/A                      |
| 66. System State          | SS          | E               | Local MPU - AP                | N/A                      |
| 67. Table Data Request    | DR          | B               | MPU - CDMRP                   | Table Data Return        |

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TABLE E-1

MESSAGE TYPE OVERVIEW (Continued)

|                                   | <u>Type</u> | <u>Category</u> | <u>Path</u>             | <u>"Next Msg"</u>   |
|-----------------------------------|-------------|-----------------|-------------------------|---------------------|
| 68. Table Data Return             | DL          | F               | CDMRP - MPU             | N/A                 |
| 69. Table Status Request*         | TS          | E               | MPU - Monitor AP        | Table Status Return |
| 70. Table Status Return           | ST          | F               | Monitor AP - MPU        | N/A                 |
| 71. Tables Rebuilt                | RB          | F               | MPU - Monitor           | N/A                 |
| 72. Timeout Expired*              | TE          | E               | MPU - Local AP          | N/A                 |
| 73. Unsolicited APC Termination   | CE          | F               | MPU - Monitor           | Update APC Table    |
| 74. Unsolicited Initiation Accept | IA          | G               | MPU - MPU               | N/A                 |
| 75. Unsuccessful Initiation       | NI          | G               | Child MPU - Parent MPU  | N/A                 |
| 76. Unstable Table                | UT          | E               | MPU - Monitor           | N/A                 |
| 77. Update APC Table              | UA          | E               | Monitor AP - Monitor AP | N/A                 |
| 78. Update Host Table             | UA          | E               | Monitor AP - Monitor AP | N/A                 |

TABLE E-2

MESSAGE CATEGORY REVIEW

| Category ID | Category Definition | MPU Special Processing*<br>(Beyond basic set of<br>Message Management<br>Functions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A           | Guaranteed Delivery | <p>At Source</p> <ol style="list-style-type: none"><li>1. Checks Authority</li><li>2. Creates Entry in<br/>Guaranteed<br/>Delivery Table</li><li>3. Logs the Message</li><li>4. Sends Accept Status to AP</li><li>5. Routes and Sends the<br/>Message</li></ol> <p>At Destination</p> <ol style="list-style-type: none"><li>1. Determines whether<br/>message requires AP<br/>initiation (and does so<br/>if required)</li><li>2. Delivers Message</li><li>3. Formats and Sends<br/>Guaranteed Delivery<br/>Accept message on receipt<br/>of CALL "GDACK" from AP</li></ol> <p>At Source Again</p> <ol style="list-style-type: none"><li>1. On receipt of Guaranteed<br/>Delivery Accept Message -<br/>deletes entry in<br/>Guaranteed Delivery Table</li></ol> |
| B           | Response Required   | <p>At Source</p> <ol style="list-style-type: none"><li>1. Checks Authority</li><li>2. Creates Entry in Pair<br/>Table</li><li>3. Logs Message</li><li>4. Routes and Sends Message</li></ol> <p>At Destination</p> <ol style="list-style-type: none"><li>1. Determines whether<br/>message requires AP</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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initiation (and does so  
if required)  
2. Delivers Message

\*MPU Special Processing is treated here in a rather general sense. Details of these functions are provided in Section 4.2.

TABLE E-2  
MESSAGE CATEGORY REVIEW (Continued)

| <u>Category ID</u> | <u>Category Definition</u>            | MPU Special Processing<br>(Beyond basic set of Message<br>Category ID Category<br>Definition Management<br>Functions)                                                                                                                                                                                 |
|--------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C                  | System Command -<br>No Response       | At Source<br>A. Where MPU is the source<br>1. Formats Message<br>2. Logs Message<br>3. Routes and Sends<br>Message<br>B. Where Monitor AP is<br>the Source<br>1. Logs Message<br>2. Routes and Sends<br>Message<br><br>At Destination<br>1. Performs processing in<br>accordance with<br>Message Type |
| D                  | System Command -<br>Response Required | At Source<br>1. Formats Message<br>2. Creates Entry in Pair<br>Table<br>3. Logs Message<br>4. Routes and Sends<br>Message<br><br>At Destination<br>1. Performs Processing in<br>accordance with<br>Message Type                                                                                       |
| E                  | Unsolicited Message                   | At Source<br>A. Where MPU is the<br>source<br>1. Formats Message<br>2. Logs Message<br>3. Routes and Sends                                                                                                                                                                                            |

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**Message**

- B. Where local AP is the Source**
1. Logs Message
  2. Routes and Sends Message

**At Destination**

1. Determines whether Message requires AP Initiation (and does so, if required)
2. Delivers Message
3. Sends Initiation ACK (if required)



**TABLE E-2**  
**MESSAGE CATEGORY REVIEW (Continued)**

| Category ID | Category Definition                                        | MPU Special Processing<br>(Beyond basic set of Message<br>Management functions)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F           | Solicited Message                                          | <p>At Source</p> <p>A. Where MPU is the source</p> <ol style="list-style-type: none"><li>1. Formats Message</li><li>2. Logs Message</li><li>3. Routes and Sends<br/>Message</li></ol> <p>B. Where local AP is the<br/>Source</p> <ol style="list-style-type: none"><li>1. Logs Message</li><li>2. Routes and Sends<br/>Message</li></ol> <p>At Destination</p> <ol style="list-style-type: none"><li>1. Locates and deletes Entry<br/>in Pair Table (if entry<br/>is still in pair table -<br/>if entry is not found the<br/>message is discarded and<br/>an MT message is<br/>generated)</li><li>2. Delivers Message (if<br/>entry was in Pair Table)</li></ol> |
| G           | AP Status Message<br>(from Local AP<br>to its MPU<br>only) | <p>At Source</p> <p>N/A</p> <p>At Destination</p> <ol style="list-style-type: none"><li>1. Updates AP Status Table</li><li>2. Performs any processing<br/>implied by AP's status<br/>(e.g., sending status<br/>messages to the AP's<br/>Parent, requesting<br/>clean-up, etc.)</li></ol>                                                                                                                                                                                                                                                                                                                                                                         |

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H

**Initiation Message**

**At Source**

1. Checks Authority
2. Creates Child Table Entry
3. Logs Message
4. Routes and Sends Message

**At Destination**

1. Initiates AP
2. Creates entries in AP  
Status Table and I'm  
Alive Table

**TABLE E-2**  
**MESSAGE CATEGORY REVIEW (Continued)**

| <b><u>Category ID</u></b> | <b><u>Category Definition</u></b> | <b><u>NPU Special Processing</u></b><br><b><u>(Beyond basic set of Message</u></b><br><b><u>Management functions)</u></b>                                                                                                                  |
|---------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>I</b>                  | <b>Messages from COMM</b>         | <b>At Source</b><br>1. Logs Message<br>2. Creates Entry in Pair Table<br>3. Routes and Sends Message<br><br><b>At Destination</b><br>1. Determines whether message requires AP initiation (and does so if required)<br>2. Delivers Message |
| <b>J</b>                  | <b>Paired Specific Initiation</b> | <b>At Source</b><br>1. Logs Message<br>2. Creates entries in Pair Table and child table<br>3. Routes and Sends Message<br><br><b>At Destination</b><br>1. Initiates New AP Instance<br>2. Delivers Message                                 |

Message Type: Abort AP

Type ID: AB

**Nature of Message:**

Message to an MPU informing it that one of its resident AP's is to be abnormally terminated. The MPU will handle the actual abort via either an OS call or by sending this message to the APs that manage "Soft Aborts." The MPU's handling of this message is determined by the given AP's characteristics in regard to aborts.

Path: Parent MPU - Child MPU  
Parent AP - Child MPU

| Header Fields         | Header Values             | Data Fields    | Data Values |
|-----------------------|---------------------------|----------------|-------------|
| Header Format         | A                         | AP Name (AP    | PIC X(10)   |
| Header Length         | 092                       | to be aborted) |             |
| Data Length           | 0013                      |                |             |
| Binary/Native Flag    | N (Default)               | Channel ID     | PIC X(3)    |
| Priority Flag         | 1                         | (of AP to      |             |
| Message Type          | AB                        | be aborted)    |             |
| AP Name (Dest.)       | Child MPU                 |                |             |
| Instance (Dest.)      | Det by SysGen Parameter   |                |             |
| APC Name (Dest.)      | Child APC                 |                |             |
| AP Name (Source)      | Parent AP-or-Parent MPU   |                |             |
| Instance (Source)     | Parent AP Inst - or - MPU |                |             |
|                       | Instance                  |                |             |
| APC Name (Source)     | Local APC                 |                |             |
| Message Serial #      | Filled in by Source MPU   |                |             |
| Processing Code       | Given by Source AP Int.   |                |             |
| Message Category      | C                         |                |             |
| Priority of Source AP | from AP Char. Table       |                |             |
| Integrity Check Flag  | 0 (Default)               |                |             |
| Logging Flag          | 1                         |                |             |
| Stat. Collection Flag | 1                         |                |             |
| Test Flag             | 0 (Default)               |                |             |
| Delivery Trigger Flag | 0 (Default)               |                |             |
| Delivery Time Trigger | blank (Default)           |                |             |
| Delivery Trig. Cond.  | blank (Default)           |                |             |
| Original Source       | of Msg. Source AP         |                |             |
| Channel ID            | of Msg. Source AP         |                |             |
| Continuation Flag     | 0                         |                |             |

DS 620142000  
1 November 1985

Message Type: Active List

Type ID: AA

**Nature of Message:**

List of all active APs on a given AP Cluster. Response to List Request Message.

Path: MPU - Monitor

| Header Fields         | Header Values           | Data Fields               | Data Values |
|-----------------------|-------------------------|---------------------------|-------------|
| Header Format         | A                       | For all Active APs on APC |             |
| Header Length         | 092                     | AP Name                   | PIC X(10)   |
| Data Length           | Variable                | Instance                  | PIC X(2)    |
| Binary/Native Flag    | N (Default)             | On Abort Value            | PIC X       |
| Priority Flag         | 0                       | (from AP Charc.           |             |
| Message Type          | AA                      | Table)                    |             |
| AP Name (Dest.)       | Monitor AP              | Original Source           | PIC X(15)   |
| Instance (Dest.)      | Det by SysGen Parameter |                           |             |
| APC Name (Dest.)      | Monitor's APC           |                           |             |
| AP Name (Source)      | Providing the List      |                           |             |
| Instance (Source)     | Det by SysGen Parameter |                           |             |
| APC Name (Source)     | MPU's APC               |                           |             |
| Message Serial #      | Filled in by Source MPU |                           |             |
| Processing Code       | 0                       |                           |             |
| Message Category      | F                       |                           |             |
| Priority of Source AP | 0                       |                           |             |
| Integrity Check Flag  | 0 (Default)             |                           |             |
| Logging Flag          | 1                       |                           |             |
| Stat. Collection Flag | 1                       |                           |             |
| Test Flag             | 0 (Default)             |                           |             |
| Delivery Trigger Flag | 0 (Default)             |                           |             |
| Delivery Time Trigger | blank (Default)         |                           |             |
| Delivery Trig. Cond.  | blank (Default)         |                           |             |
| Original Source       | of Msg. Source AP       |                           |             |
| Channel ID            | MPU's Channel           |                           |             |
| Continuation Flag     | 0                       |                           |             |

DS 620142000  
1 November 1985

Message Type: AP Alive

Type ID: AL

**Nature of Message:**

Message from an initiated instance of an AP to its local MPU informing it that the AP is up and ready to run. Upon receipt, the MPU will delete the relevant entry in its "I'm alive table." Further, the MPU will update the AP Status Table entry for the given AP Instance.

Path: AP - Local MPU

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | AP Process Name    | PIC X(12)          |
| Header Length         | 092                     |                    |                    |
| Data Length           | 0012                    |                    |                    |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | AL                      |                    |                    |
| AP Name (Dest.)       | Local MPU               |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Local APC               |                    |                    |
| AP Name (Source)      | Init. AP                |                    |                    |
| Instance (Source)     | Assigned by MPU at Init |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | Given by AP Int         |                    |                    |
| Message Category      | G                       |                    |                    |
| Priority of Source AP | 0                       |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: AP Already Dead\*

Type ID: AM

**Nature of Message:**

Sent when an MPU attempts to deliver a message to an AP  
that has terminated.

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | Status Code   | PIC X(5)    |
| Header Length         | 092                     | Name String   | PIC X(7)    |
| Data Length           | 0017                    | (Process name |             |
| Binary/Native Flag    | N (Default)             | of Dead AP)   |             |
| Priority Flag         | 0                       | Filler        | PIC X(5)    |
| Message Type          | AM                      |               |             |
| AP Name (Dest.)       | Monitor AP              |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | Monitors APC            |               |             |
| AP Name (Source)      | Dead APs MPU            |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Local APC               |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | G                       |               |             |
| Priority of Source AP | From AP Char. Table     |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | of Msg. Source AP       |               |             |
| Continuation Flag     | 0                       |               |             |

DS 620142000  
1 November 1985

Message Type: AP Dying

Type ID: AD

**Nature of Message:**

AP Status information given to the AP's MPU when the AP is terminating. The MPU will use the data provided to update the local AP Status Table. The MPU will then send a child status message to the dying AP's Parent MPU.

Path: AP - MPU

| Header Fields         | Header Values           | Data Fields | Data Values  |
|-----------------------|-------------------------|-------------|--------------|
| Header Format         | A                       | Termination | PIC X        |
| Header Length         | 092                     | Status      |              |
| Data Length           | 0001                    |             | 88 Normal    |
| Binary/Native Flag    | N (Default)             |             | Term.        |
| Priority Flag         | 0                       |             | 88 Shutdown  |
| Message Type          | AD                      |             | Complete     |
| AP Name (Dest.)       | Term. AP's MPU          |             | 88 Aborted   |
| Instance (Dest.)      | Det by SysGen Parameter |             | 88 Exception |
| APC Name (Dest.)      | Local APC               |             | Condition    |
| AP Name (Source)      | Term. AP                |             |              |
| Instance (Source)     | Assigned by MPU at Init |             |              |
| APC Name (Source)     | Local APC               |             |              |
| Message Serial #      | Filled in by Source MPU |             |              |
| Processing Code       | Given by AP Interface   |             |              |
| Message Category      | G                       |             |              |
| Priority of Source AP | From AP Char. Table     |             |              |
| Integrity Check Flag  | 0 (Default)             |             |              |
| Logging Flag          | 1                       |             |              |
| Stat. Collection Flag | 1                       |             |              |
| Test Flag             | 0 (Default)             |             |              |
| Delivery Trigger Flag | 0 (Default)             |             |              |
| Delivery Time Trigger | blank (Default)         |             |              |
| Delivery Trig. Cond.  | blank (Default)         |             |              |
| Original Source       | of Msg. Source AP       |             |              |
| Channel ID            | of Msg. Source AP       |             |              |
| Continuation Flag     | 0                       |             |              |



DS 620142000  
1 November 1985

Message Type: AP Ending

Type ID: AE

**Nature of Message:**

Message sent when the AP's having the characteristic of requiring a message on a child AP's termination.

Path: MPU - AP

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | Child Process |             |
| Header Length         | 092                     | Name          | PIC X(12)   |
| Data Length           | 0016                    | Child Channel |             |
| Binary/Native Flag    | N (Default)             | ID            | PIC X(3)    |
| Priority Flag         | 0                       | Child         | PIC X       |
| Message Type          | AE                      | Termination   |             |
| AP Name (Dest.)       | Parent AP               | Status        |             |
| Instance (Dest.)      | Assigned by MPU at Init |               |             |
| APC Name (Dest.)      | Local APC               |               |             |
| AP Name (Source)      | Local MPU               |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Local APC               |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | G                       |               |             |
| Priority of Source AP | From AP Char. Table     |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | of Msg. Source AP       |               |             |
| Continuation Flag     | 0                       |               |             |

Message Type: AP Interface Error (to Monitor)\* Type ID: 32

**Nature of Message:**

Message sent to the Monitor AP when the MPU discovers errors in the message header as formatted by the AP Interface. The MPU also sends an AI message to the Source AP (using a different format - See AP Interface Error - to Source AP).

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields     | Data Values |
|-----------------------|-------------------------|-----------------|-------------|
| Header Format         | A                       | AI Error Code   | PIC X(5)    |
| Header Length         | 092                     |                 |             |
| Data Length           | 0017                    | AP Name         | PIC X(7)    |
| Binary/Native Flag    | N (Default - Native)    |                 |             |
| Priority Flag         | 0                       | Processing code | PIC X(5)    |
| Message Type          | 32                      |                 |             |
| AP Name (Dest.)       | Monitor AP              |                 |             |
| Instance (Dest.)      | Det by SysGen Parameter |                 |             |
| APC Name (Dest.)      | Monitor's APC           |                 |             |
| AP Name (Source)      | MPU at Error Source     |                 |             |
| Instance (Source)     | Det by SysGen Parameter |                 |             |
| APC Name (Source)     | Local APC               |                 |             |
| Message Serial #      | Filled in by Source MPU |                 |             |
| Processing Code       | 1                       |                 |             |
| Message Category      | E                       |                 |             |
| Priority of Source AP | 0 (Default)             |                 |             |
| Integrity Check Flag  | 0 (Default - No)        |                 |             |
| Logging Flag          | 1 (Yes)                 |                 |             |
| Stat. Collection Flag | 1 (Yes)                 |                 |             |
| Test Flag             | 0 (Default - No)        |                 |             |
| Delivery Trigger Flag | 0 (Default - Immed.)    |                 |             |
| Delivery Time Trigger | blank (Default)         |                 |             |
| Delivery Trig. Cond.  | blank (Default)         |                 |             |
| Original Source       | of Msg. Source AP       |                 |             |
| Channel ID            | APC Name                |                 |             |
| Continuation Flag     | 0                       |                 |             |

DS 620142000  
1 November 1985

Message Type: AP Interface Error (to Source AP)\*    Type ID: 32

**Nature of Message:**

Sent to the Source AP when the MPU discover an error in the message header header as formatted by the AP Interface.

Path: MPU - Source AP

| Header Fields         | Header Values            | Data Fields     | Data Values |
|-----------------------|--------------------------|-----------------|-------------|
| Header Format         | A                        | Error Code      | PIC X(5)    |
| Header Length         | 092                      |                 |             |
| Data Length           | 0102                     | Bad Header      | PIC X(92)   |
| Binary/Native Flag    | N (Default)              |                 |             |
| Priority Flag         | 0                        | Processing code | PIC X(5)    |
| Message Type          | 32                       |                 |             |
| AP Name (Dest.)       | Error Source AP          |                 |             |
| Instance (Dest.)      | Error Source AP Instance |                 |             |
| APC Name (Dest.)      | Local APC                |                 |             |
| AP Name (Source)      | Local MPU                |                 |             |
| Instance (Source)     | Det by SysGen Parameter  |                 |             |
| APC Name (Source)     | Local APC                |                 |             |
| Message Serial #      | Filled in by Local MPU   |                 |             |
| Processing Code       | 1                        |                 |             |
| Message Category      | E                        |                 |             |
| Priority of Source AP | From AP Char. Table      |                 |             |
| Integrity Check Flag  | 0 (Default)              |                 |             |
| Logging Flag          | 1                        |                 |             |
| Stat. Collection Flag | 1                        |                 |             |
| Test Flag             | 0 (Default)              |                 |             |
| Delivery Trigger Flag | 0 (Default )             |                 |             |
| Delivery Time Trigger | blank (Default)          |                 |             |
| Delivery Trig. Cond.  | blank (Default)          |                 |             |
| Original Source       | Monitor AP               |                 |             |
| Channel ID            | APC Name                 |                 |             |
| Continuation Flag     | 0                        |                 |             |

DS 620142000  
1 November 1985

Message Type: AP Initiating at Shutdown\*

Type ID: NL

**Nature of Message:**

Message informing the operator that an AP is in the process of initiating. This message is sent (if the AP state exists) during shutdown procedures undertaken upon receipt of a shutdown AP or shutdown APC command.

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields  | Data Values |
|-----------------------|-------------------------|--------------|-------------|
| Header Format         | A                       | Status Code  | PIC X(5)    |
| Header Length         | 092                     | Name String  | PIC X(7)    |
| Data Length           | 0017                    | (AP in Init) |             |
| Binary/Native Flag    | N (Default)             | Filler       | PIC X(5)    |
| Priority Flag         | 0                       |              |             |
| Message Type          | NL                      |              |             |
| AP Name (Dest.)       | Monitor AP              |              |             |
| Instance (Dest.)      | Det by SysGen Parameter |              |             |
| APC Name (Dest.)      | Monitor's APC           |              |             |
| AP Name (Source)      | AP's MPU                |              |             |
| Instance (Source)     | Det by SysGen Parameter |              |             |
| APC Name (Source)     | Local APC               |              |             |
| Message Serial #      | Filled in by Source MPU |              |             |
| Processing Code       | 1                       |              |             |
| Message Category      | G                       |              |             |
| Priority of Source AP | From AP Char. Table     |              |             |
| Integrity Check Flag  | 0 (Default)             |              |             |
| Logging Flag          | 1                       |              |             |
| Stat. Collection Flag | 1                       |              |             |
| Test Flag             | 0 (Default)             |              |             |
| Delivery Trigger Flag | 0 (Default)             |              |             |
| Delivery Time Trigger | blank (Default)         |              |             |
| Delivery Trig. Cond.  | blank (Default)         |              |             |
| Original Source       | of Msg. Source AP       |              |             |
| Channel ID            | of Msg. Source AP       |              |             |
| Continuation Flag     | 0                       |              |             |

DS 620142000  
1 November 1985

Message Type: AP Status Request

Type ID: SR

**Nature of Message:**

Request for the current status of a given AP. The request will cause a table lookup of the given AP's APC AP Status Table.

Path: Any AP - Any MPU

| Header Fields         | Header Values           | Data Fields     | Data Values |
|-----------------------|-------------------------|-----------------|-------------|
| Header Format         | A                       | AP Name (for    | PIC X(10)   |
| Header Length         | 092                     | which status is |             |
| Data Length           | 0010                    | required)       |             |
| Binary/Native Flag    | N (Default)             |                 |             |
| Priority Flag         | 0                       |                 |             |
| Message Type          | SR                      |                 |             |
| AP Name (Dest.)       | Given AP's MPU          |                 |             |
| Instance (Dest.)      | Det by SysGen Parameter |                 |             |
| APC Name (Dest.)      | MPU's APC               |                 |             |
| AP Name (Source)      | Calling AP              |                 |             |
| Instance (Source)     | Calling AP Inst.        |                 |             |
| APC Name (Source)     | Local APC               |                 |             |
| Message Serial #      | Filled in by Source MPU |                 |             |
| Processing Code       | Given by Source AP Int. |                 |             |
| Message Category      | B                       |                 |             |
| Priority of Source AP | From AP Char. Table     |                 |             |
| Integrity Check Flag  | 0 (Default)             |                 |             |
| Logging Flag          | 1                       |                 |             |
| Stat. Collection Flag | 1                       |                 |             |
| Test Flag             | 0 (Default)             |                 |             |
| Delivery Trigger Flag | 0 (Default)             |                 |             |
| Delivery Time Trigger | blank (Default)         |                 |             |
| Delivery Trig. Cond.  | blank (Default)         |                 |             |
| Original Source       | of Msg. Source AP       |                 |             |
| Channel ID            | Specified or Default    |                 |             |
| Continuation Flag     | 0                       |                 |             |

DS 620142000  
1 November 1985

Message Type: AP Status Return

Type ID: IS

Nature of Message:

Return on an AP Status Request.

Path: MPU - Requesting AP

| Header Fields         | Header Values             | Data Fields     | Data Values |
|-----------------------|---------------------------|-----------------|-------------|
| Header Format         | A                         | AP Name         | PIC X(10)   |
| Header Length         | 092                       | (specified in   |             |
| Data Length           | 0011                      | Status Request) |             |
| Binary/Native Flag    | N (Default)               |                 |             |
| Priority Flag         | 0                         | AP Status       | PIC X       |
| Message Type          | IS                        |                 |             |
| AP Name (Dest.)       | Source of SR Message      |                 |             |
| Instance (Dest.)      | Source Inst of SR Message |                 |             |
| APC Name (Dest.)      | Source APC of SR Message  |                 |             |
| AP Name (Source)      | Given AP's MPU            |                 |             |
| Instance (Source)     | Det by SysGen Parameter   |                 |             |
| APC Name (Source)     | Local APC                 |                 |             |
| Message Serial #      | Filled in by Source MPU   |                 |             |
| Processing Code       | 0                         |                 |             |
| Message Category      | F                         |                 |             |
| Priority of Source AP | 0                         |                 |             |
| Integrity Check Flag  | 0 (Default)               |                 |             |
| Logging Flag          | 1                         |                 |             |
| Stat. Collection Flag | 1                         |                 |             |
| Test Flag             | 0 (Default)               |                 |             |
| Delivery Trigger Flag | 0 (Default)               |                 |             |
| Delivery Time Trigger | blank (Default)           |                 |             |
| Delivery Trig. Cond.  | blank (Default)           |                 |             |
| Original Source       | of SR Msg                 |                 |             |
| Channel ID            | of SR Msg                 |                 |             |
| Continuation Flag     | 0                         |                 |             |

DS 620142000  
1 November 1985

Message Type: APC Alive\*

Type ID: LV

**Nature of Message:**

Status message informing Monitor AP that the APC has completed its start-up processing and is ready to accept messages. Upon receipt, the Monitor AP will update its own APC status table and send an "APC Table Update" message to its off-host siblings.

Path: MPU - Monitor AP

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Fields</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | Status Code        | PIC X(5)           |
| Header Length         | 002                     |                    |                    |
| Data Length           | 0017                    | Filler             | PIC X(12)          |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | LV                      |                    |                    |
| AP Name (Dest.)       | Monitor AP              |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Monitor's APC           |                    |                    |
| AP Name (Source)      | APC's MPU               |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | 1                       |                    |                    |
| Message Category      | E                       |                    |                    |
| Priority of Source AP | 0 (Default)             |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 000142000  
1 November 1986

Message Type: APC Availability Request

Type ID: AV

**Nature of Message:**

Sent as a result of an AP invoking the "VEONCA" service  
The data portion contains the name of the APC of interest  
to the calling APC.

Path AP - Local NPU

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | APC Name    | PIC K(3)    |
| Header Length         | 002                     |             |             |
| Data Length           | 0003                    |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 1                       |             |             |
| Message Type          | AV                      |             |             |
| AP Name (Dest.)       | Local NPU               |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Local APC               |             |             |
| AP Name (Source)      | Requesting AP           |             |             |
| Instance (Source)     | Assigned by NPU at Init |             |             |
| APC Name (Source)     | Local APC               |             |             |
| Message Serial #      | Filled in by Source NPU |             |             |
| Processing Code       | Given by AP Interface   |             |             |
| Message Category      | D                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | of Msg. Source AP       |             |             |
| Continuation Flag     | 0                       |             |             |



DS 620142000  
1 November 1985

Message Type: APC Available Return

Type ID: VR

Nature of Message:

Sent as the response to the APC Availability Request Message.

Path: Local MPU - AP

| Header Fields         | Header Values             | Data Fields | Data Values |
|-----------------------|---------------------------|-------------|-------------|
| Header Format         | A                         | APC Status  | PIC X(3)    |
| Header Length         | 002                       |             | 88 APC up   |
| Data Length           | 0003                      |             | 88 APC Not  |
| Binary/Native Flag    | N (Default)               |             | Found       |
| Priority Flag         | 0                         |             | 88 Time     |
| Message Type          | VR                        |             | Out         |
| AP Name (Dest.)       | Source of AV Message      |             | (if APC     |
| Instance (Dest.)      | Source Inst of AV Message |             | does not    |
| APC Name (Dest.)      | Local APC                 |             | come up     |
| AP Name (Source)      | Local MPU                 |             | within      |
| Instance (Source)     | Det by SysGen Parameter   |             | reasonable  |
| APC Name (Source)     | Local APC                 |             | period of   |
| Message Serial #      | Filled in by Source MPU   |             | time)       |
| Processing Code       | 1                         |             |             |
| Message Category      | F                         |             |             |
| Priority of Source AP | From AP Char. Table       |             |             |
| Integrity Check Flag  | 0 (Default)               |             |             |
| Logging Flag          | 1                         |             |             |
| Stat. Collection Flag | 1                         |             |             |
| Test Flag             | 0 (Default)               |             |             |
| Delivery Trigger Flag | 0 (Default)               |             |             |
| Delivery Time Trigger | blank (Default)           |             |             |
| Delivery Trig. Cond.  | blank (Default)           |             |             |
| Original Source       | of Msg. Source AP         |             |             |
| Channel ID            | of Msg. Source AP         |             |             |
| Continuation Flag     | 0                         |             |             |

DS 620142000  
1 November 1985

**Message Type: APC Name Request**

**Type ID: AN**

**Nature of Message:**

Sent as a result of an AP invoking the "WHATAC" service.  
The MPU will read the AP Information Table to find the APC  
upon which the given AP resides.

**Path: AP - Local MPU**

| <b>Header Fields</b>  | <b>Header Values</b>    | <b>Data Fields</b> | <b>Data Values</b> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | AP Name            | PIC X(10)          |
| Header Length         | 092                     |                    |                    |
| Data Length           | 0010                    |                    |                    |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 1                       |                    |                    |
| Message Type          | AN                      |                    |                    |
| AP Name (Dest.)       | Local MPU               |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Local APC               |                    |                    |
| AP Name (Source)      | Requesting AP           |                    |                    |
| Instance (Source)     | Assigned by MPU at Init |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | Given by AP Interface   |                    |                    |
| Message Category      | D                       |                    |                    |
| Priority of Source AP | From AP Char. Table     |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: APC Name Return

Type ID: NA

**Nature of Message:**

Sent in response to the APC Name Request message. The data portion contains the name of the APC on which the given AP resides. In the event that the given AP name was not found, the data portion will contain a three character error code.

Path: Local MPU - AP

| Header Fields         | Header Values             | Data Fields | Data Values |
|-----------------------|---------------------------|-------------|-------------|
| Header Format         | A                         | APC Name    | PIC X(3)    |
| Header Length         | 092                       |             |             |
| Data Length           | 0003                      |             |             |
| Binary/Native Flag    | N (Default)               |             |             |
| Priority Flag         | 0                         |             |             |
| Message Type          | NA                        |             |             |
| AP Name (Dest.)       | Source of AN Message      |             |             |
| Instance (Dest.)      | Source Inst of AN Message |             |             |
| APC Name (Dest.)      | Local APC                 |             |             |
| AP Name (Source)      | Local MPU                 |             |             |
| Instance (Source)     | Det by SysGen Parameter   |             |             |
| APC Name (Source)     | Local APC                 |             |             |
| Message Serial #      | Filled in by Source MPU   |             |             |
| Processing Code       | 1                         |             |             |
| Message Category      | F                         |             |             |
| Priority of Source AP | From AP Char. Table       |             |             |
| Integrity Check Flag  | 0 (Default)               |             |             |
| Logging Flag          | 1                         |             |             |
| Stat. Collection Flag | 1                         |             |             |
| Test Flag             | 0 (Default)               |             |             |
| Delivery Trigger Flag | 0 (Default)               |             |             |
| Delivery Time Trigger | blank (Default)           |             |             |
| Delivery Trig. Cond.  | blank (Default)           |             |             |
| Original Source       | of Msg. Source AP         |             |             |
| Channel ID            | of Msg. Source AP         |             |             |
| Continuation Flag     | 0                         |             |             |

DS 620142000  
1 November 1985

Message Type: APC Status Request

Type ID: PS

**Nature of Message:**

Sent as a result of an AP invoking the "ACSTAT" service.  
The data portion contains the name of the APC of interest  
to the calling AP.

Path: AP - Local MPU

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | APC Name    | PIC X(3)    |
| Header Length         | 002                     |             |             |
| Data Length           | 0003                    |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | PS                      |             |             |
| AP Name (Dest.)       | Local MPU               |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Local APC               |             |             |
| AP Name (Source)      | Requesting AP           |             |             |
| Instance (Source)     | Assigned by MPU at Init |             |             |
| APC Name (Source)     | Local APC               |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | Given by AP Interface   |             |             |
| Message Category      | D                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | of Msg. Source AP       |             |             |
| Continuation Flag     | 0                       |             |             |

DS 090149000  
1 November 1985

Message Type: APC Status Return

Type ID: PR

**Nature of Message:**

Sent in response to the APC status request message. The data portion contains the current status of the given APC.

Path: AP - Local NPU

| <u>Header Fields</u>  | <u>Header Values</u>      | <u>Data Fields</u> | <u>Data V</u> |
|-----------------------|---------------------------|--------------------|---------------|
| Header Format         | A                         | APC Status         | PIC X         |
| Header Length         | 002                       |                    |               |
| Data Length           | 0001                      |                    |               |
| Binary/Native Flag    | N (Default)               |                    |               |
| Priority Flag         | 0                         |                    |               |
| Message Type          | PR                        |                    |               |
| AP Name (Dest.)       | Source of PS Message      |                    |               |
| Instance (Dest.)      | Source Inst of PS Message |                    |               |
| APC Name (Dest.)      | Local APC                 |                    |               |
| AP Name (Source)      | Local NPU                 |                    |               |
| Instance (Source)     | Det by SysGen Parameter   |                    |               |
| APC Name (Source)     | Local APC                 |                    |               |
| Message Serial #      | Filled in by Source NPU   |                    |               |
| Processing Code       | 1                         |                    |               |
| Message Category      | F                         |                    |               |
| Priority of Source AP | From AP Char. Table       |                    |               |
| Integrity Check Flag  | 0 (Default)               |                    |               |
| Logging Flag          | 1                         |                    |               |
| Stat. Collection Flag | 1                         |                    |               |
| Test Flag             | 0 (Default)               |                    |               |
| Delivery Trigger Flag | 0 (Default)               |                    |               |
| Delivery Time Trigger | blank (Default)           |                    |               |
| Delivery Trig. Cond.  | blank (Default)           |                    |               |
| Original Source       | of Msg. Source AP         |                    |               |
| Channel ID            | of Msg. Source AP         |                    |               |
| Continuation Flag     | 0                         |                    |               |

DS 620142000  
1 November 1985

**Message Type: APC Terminated\***

**Type ID: CT**

**Nature of Message:**

Notification that an APC has completed the shutdown processing requested by the Monitor AP.

**Path: MPU - Monitor AP**

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | Status Code        | PIC X(5)           |
| Header Length         | 002                     |                    |                    |
| Data Length           | 0017                    | Filler             | PIC X(12)          |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | CT                      |                    |                    |
| AP Name (Dest.)       | Monitor AP              |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Monitor's APC           |                    |                    |
| AP Name (Source)      | Shutdown APC's MPU      |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | 1                       |                    |                    |
| Message Category      | E                       |                    |                    |
| Priority of Source AP | 0                       |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: Cancel Shutdown

Type ID: CS

**Nature of Message:**

Message overriding a shutdown in X minutes notice. This message is applicable only if the shutdown pending is still outstanding. Once shutdown procedures have begun, they cannot be stopped.

Path: Monitor AP - UI AP

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | N/A                |                    |
| Header Length         | 092                     |                    |                    |
| Data Length           | 0                       |                    |                    |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 1                       |                    |                    |
| Message Type          | CS                      |                    |                    |
| AP Name (Dest.)       | UI AP                   |                    |                    |
| Instance (Dest.)      | Assigned by MPU at Init |                    |                    |
| APC Name (Dest.)      | UI APC                  |                    |                    |
| AP Name (Source)      | Monitor AP              |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Monitor's APC           |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | 1                       |                    |                    |
| Message Category      | C                       |                    |                    |
| Priority of Source AP | From AP Char. Table     |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

**Message Type: Change Role**

**Type ID: CR**

**Nature of Message:**

Allows a user to change roles within a given session. The new role must be one that the user is authorized for.

**Path: UI AP - Monitor AP**

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | Terminal ID        | PIC X(2)           |
| Header Length         | 002                     |                    |                    |
| Data Length           | 0020                    | User Name          | PIC X(8)           |
| Binary/Native Flag    | N (Default)             | New Role           | PIC X(10)          |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | CR                      |                    |                    |
| AP Name (Dest.)       | Monitor AP              |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Monitor's APC           |                    |                    |
| AP Name (Source)      | UI AP                   |                    |                    |
| Instance (Source)     | Assigned by MPU at Init |                    |                    |
| APC Name (Source)     | UI's APC                |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | Given by AP Interface   |                    |                    |
| Message Category      | E                       |                    |                    |
| Priority of Source AP | From AP Char. Table     |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |



DS 620142000  
1 November 1985

Message Type: Child AP Status

Type ID: CA

**Nature of Message:**

Relevant status of a child AP. The data is sent to the Parent AP's MPU upon specified events. Upon receipt of the message, given the child's status, the Parent AP's MPU may send a cleanup message back to the child's MPU.

Path: Child AP's MPU - Parent AP's MPU

| Header Fields         | Header Values           | Data Fields  | Data Values |
|-----------------------|-------------------------|--------------|-------------|
| Header Format         | A                       | Process Name | PIC X(12)   |
| Header Length         | 092                     | (of child)   |             |
| Data Length           | 0016                    |              |             |
| Binary/Native Flag    | N (Default)             | Channel ID   | PIC X(3)    |
| Priority Flag         | 0                       | (of child)   |             |
| Message Type          | CA                      |              |             |
| AP Name (Dest.)       | Parent MPU              | Child AP     | PIC X       |
| Instance (Dest.)      | Det by SysGen           | Status       | 88 Abort    |
|                       | Parameter               |              |             |
| APC Name (Dest.)      | From Dest AP Name       |              | Acknowl     |
| AP Name (Source)      | Child MPU               |              | 88 Child    |
| Instance (Source)     | Det by SysGen Parameter |              | Normally    |
| APC Name (Source)     | Local APC               |              | Termin'd    |
| Message Serial #      | Filled in by Source MPU |              | No Active   |
| Processing Code       | 0                       |              | Children    |
| Message Category      | E                       |              | 88 Child    |
| Priority of Source AP | 0                       |              | Shutdown    |
| Integrity Check Flag  | 0 (Default)             |              | in APC SD   |
| Logging Flag          | 1                       |              | 88 Child    |
| Stat. Collection Flag | 1                       |              | Shutdown    |
| Test Flag             | 0 (Default)             |              | in AP SD    |
| Delivery Trigger Flag | 0 (Default)             |              | 88 Child    |
| Delivery Time Trigger | blank (Default)         |              | Shutdown    |
| Delivery Trig. Cond.  | blank (Default)         |              | in Host SD  |
| Original Source       | of Msg. Source AP       |              | 88 Child    |
| Channel ID            | of Msg. Source AP       |              | Initiated   |
| Continuation Flag     | 0                       |              | 88 Normal   |
|                       |                         |              | Termi-      |
|                       |                         |              | nation      |
|                       |                         |              | Active      |
|                       |                         |              | Children    |

DS 630142000  
1 November 1985

Message Type: Cleanup

Type ID: CL

**Nature of Message:**

Notification to clean up tables and messages for a given AP. Sent when all child AP's below a point have terminated with no active children of their own. The child AP's MPU can now delete the child's entry in the AP Status table.

Path: Parent AP's MPU - Child AP's MPU

| Header Fields         | Header Values           | Data Fields  | Data Values |
|-----------------------|-------------------------|--------------|-------------|
| Header Format         | A                       | Process Name | PIC X(12)   |
| Header Length         | 092                     | (of child)   |             |
| Data Length           | 0015                    |              |             |
| Binary/Native Flag    | N (Default)             | Channel ID   | PIC X(3)    |
| Priority Flag         | 1                       | (of child)   |             |
| Message Type          | CL                      |              |             |
| AP Name (Dest.)       | Child AP MPU            |              |             |
| Instance (Dest.)      | Det by SysGen Parameter |              |             |
| APC Name (Dest.)      | Child APC               |              |             |
| AP Name (Source)      | Parent AP MPU           |              |             |
| Instance (Source)     | Det by SysGen Parameter |              |             |
| APC Name (Source)     | Local APC               |              |             |
| Message Serial #      | Filled in by Source MPU |              |             |
| Processing Code       | 0                       |              |             |
| Message Category      | C                       |              |             |
| Priority of Source AP | From AP Char. Table     |              |             |
| Integrity Check Flag  | 0 (Default)             |              |             |
| Logging Flag          | 1                       |              |             |
| Stat. Collection Flag | 1                       |              |             |
| Test Flag             | 0 (Default)             |              |             |
| Delivery Trigger Flag | 0 (Default)             |              |             |
| Delivery Time Trigger | blank (Default)         |              |             |
| Delivery Trig. Cond.  | blank (Default)         |              |             |
| Original Source       | of Msg. Source AP       |              |             |
| Channel ID            | of Msg. Source AP       |              |             |
| Continuation Flag     | 0                       |              |             |

Message Type: GD ACK

Type ID GA

**Nature of Message:**

Acknowledgement of the fact that a message requiring Guaranteed Delivery was received and processed by its destination AP. Upon receipt of this message, the source NPU will clean up its GD table and logs for the specified message.

Path: Destination NPU - Source NPU

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | GD Source APC | PIC X(3)    |
| Header Length         | 002                     | GD Message    | PIC X(7)    |
| Data Length           | 0010                    | Serial #      |             |
| Binary/Native Flag    | N (Default)             |               |             |
| Priority Flag         | 1                       |               |             |
| Message Type          | GA                      |               |             |
| AP Name (Dest.)       | GD Source NPU           |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | NPU's APC               |               |             |
| AP Name (Source)      | Destination NPU         |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Local APC               |               |             |
| Message Serial #      | Filled in by Source NPU |               |             |
| Processing Code       | 0                       |               |             |
| Message Category      | C                       |               |             |
| Priority of Source AP | 0                       |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | of Msg. Source AP       |               |             |
| Continuation Flag     | 0                       |               |             |

DS 620142000  
1 November 1985

Message Type: Get User Response

Type ID: UX

**Nature of Message:**

Sent in response to a Get User Request. The monitor AP will use the original source AP to access the Logon Table for the data values to be sent back to the requesting AP. The status field indicates success or failure of the table search.

Path: Monitor      Requesting AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | Status      | PIC X       |
| Header Length         | 092                     | User Name   | PIC X(8)    |
| Data Length           | 0021                    | Role Name   | PIC X(10)   |
| Binary/Native Flag    | N (Default)             | Terminal ID | PIC X(2)    |
| Priority Flag         | 0                       |             |             |
| Message Type          | UX                      |             |             |
| AP Name (Dest.)       | Source of Request       |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Request Source APC      |             |             |
| AP Name (Source)      | VAX Monitor             |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Monitor's APC           |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | E                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | XGU                     |             |             |
| Continuation Flag     | 0                       |             |             |

AO-A102 056

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS) VOLUME 6

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NETWORK TRANSACTION. (U) GENERAL ELECTRIC CO

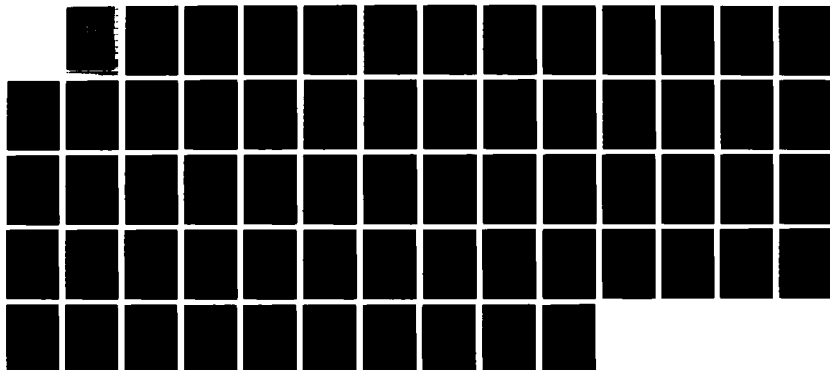
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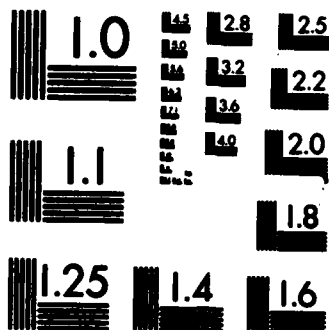
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

DS 620142000  
1 November 1985

Message Type: Get User Request

Type ID: XU

**Nature of Message:**

Request from AP (via GETUSR service) for the User Name, Role Name, and Terminal ID of the AP's original source where the original source is a User Interface AP.

Path: AP      Monitor

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | Original      | PIC X(15)   |
| Header Length         | 092                     | Source of     |             |
| Data Length           | 0015                    | Requesting AP |             |
| Binary/Native Flag    | N (Default)             |               |             |
| Priority Flag         | 0                       |               |             |
| Message Type          | XU                      |               |             |
| AP Name (Dest.)       | VAX Monitor             |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | Monitor's APC           |               |             |
| AP Name (Source)      | Requesting AP           |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Requesting AP's APC     |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | E                       |               |             |
| Priority of Source AP | From AP Char. Table     |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | XGU                     |               |             |
| Continuation Flag     | 0                       |               |             |

DS 620142000  
1 November 1985

Message Type: GD Status Request

Type ID: GS

**Nature of Message:**

Sent as a result of an AP invoking the "GDSTAT" service.  
The data portion contains the source and serial number of  
the Guaranteed Delivery Message of interest to the calling  
AP.

Path: AP - Local MPU

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | GD Message         |                    |
| Header Length         | 092                     | Source AP Name     | PIC X(10)          |
| Data Length           | 0017                    | GD Message         |                    |
| Binary/Native Flag    | N (Default)             | Serial Number      | PIC X(7)           |
| Priority Flag         | 1                       |                    |                    |
| Message Type          | GS                      |                    |                    |
| AP Name (Dest.)       | Local MPU               |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Local APC               |                    |                    |
| AP Name (Source)      | Requesting AP           |                    |                    |
| Instance (Source)     | Assigned by MPU at Init |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | Given by AP Interface   |                    |                    |
| Message Category      | D                       |                    |                    |
| Priority of Source AP | From AP Char. Table.    |                    |                    |
| Integrity Check Flag  | 0(Default)              |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |



DS 620142000  
1 November 1985

Message Type: GD Status Return

Type ID: GR

**Nature of Message:**

Sent in response to a GD Status Request. The data portion contains the current status of the Guaranteed Delivery messages specified in the request.

Path: Local MPU - AP

| Header Fields         | Header Values             | Data Fields | Data Values |
|-----------------------|---------------------------|-------------|-------------|
| Header Format         | A                         | Return Code | PIC X(3)    |
| Header Length         | 092                       |             | 88          |
|                       |                           |             | GD-Message  |
| Data Length           | 0003                      |             | -in-system  |
| Binary/Native Flag    | N (Default)               |             | 88          |
|                       |                           |             | GD-Message  |
|                       |                           |             | -Not-Found  |
| Priority Flag         | 0                         |             |             |
| Message Type          | GR                        |             |             |
| AP Name (Dest.)       | Source of GS Message      |             |             |
| Instance (Dest.)      | Source Inst of GS Message |             |             |
| APC Name (Dest.)      | Local APC                 |             |             |
| AP Name (Source)      | Local MPU                 |             |             |
| Instance (Source)     | Det by SysGen Parameter   |             |             |
| APC Name (Source)     | Local APC                 |             |             |
| Message Serial #      | Filled in by Source MPU   |             |             |
| Processing Code       | 1                         |             |             |
| Message Category      | F                         |             |             |
| Priority of Source AP | From AP Char. Table.      |             |             |
| Integrity Check Flag  | 0 (Default)               |             |             |
| Logging Flag          | 1                         |             |             |
| Stat. Collection Flag | 1                         |             |             |
| Test Flag             | 0 (Default)               |             |             |
| Delivery Trigger Flag | 0 (Default)               |             |             |
| Delivery Time Trigger | blank (Default)           |             |             |
| Delivery Trig. Cond.  | blank (Default)           |             |             |
| Original Source       | of Msg. Source AP         |             |             |
| Channel ID            | of Msg. Source AP         |             |             |
| Continuation Flag     | 0                         |             |             |

DS 620142000  
1 November 1985

Message Type: Host Active

Type ID: HU

**Nature of Message:**

Message sent to all on-host APC's to inform them that the host has completed its startup processing.

Path: Monitor AP - MPU

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | N/A                |                    |
| Header Length         | 092                     |                    |                    |
| Data Length           | 0000                    |                    |                    |
| Binary/Native Flag    | N (Default - Native)    |                    |                    |
| Priority Flag         | 1                       |                    |                    |
| Message Type          | HU                      |                    |                    |
| AP Name (Dest.)       | MPU Name                |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | MPU's APC               |                    |                    |
| AP Name (Source)      | Monitor AP              |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Monitor's APC           |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | 1                       |                    |                    |
| Message Category      | C                       |                    |                    |
| Priority of Source AP | 0 (Default)             |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1 (Yes)                 |                    |                    |
| Stat. Collection Flag | 1 (Yes)                 |                    |                    |
| Test Flag             | 0 (Default - No)        |                    |                    |
| Delivery Trigger Flag | 0 (Default - Immed)     |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: Host Available

Type ID: HA

**Nature of Message:**

Message sent at startup to inform off-host Monitor APs that a given host has completed its startup processing and is now available to receive messages.

Path: Monitor AP - Monitor AP

| Header Fields         | Header Values           | Data Fields          | Data Values |
|-----------------------|-------------------------|----------------------|-------------|
| Header Format         | A                       | For each on-host APC |             |
| Header Length         | 092                     |                      |             |
| Data Length           | Variable                | APC Name             | PIC X(3)    |
| Binary/Native Flag    | N (Default - Native)    | APC Status           | PIC X       |
| Priority Flag         | 0                       |                      |             |
| Message Type          | HA                      |                      |             |
| AP Name (Dest.)       | Off-host Monitor AP     |                      |             |
| Instance (Dest.)      | Det by SysGen Parameter |                      |             |
| APC Name (Dest.)      | Monitor's APC           |                      |             |
| AP Name (Source)      | On-Host Monitor AP      |                      |             |
| Instance (Source)     | Det by SysGen Parameter |                      |             |
| APC Name (Source)     | Local APC               |                      |             |
| Message Serial #      | Filled in by Source MPU |                      |             |
| Processing Code       | 1                       |                      |             |
| Message Category      | E                       |                      |             |
| Priority of Source AP | 0 (Default)             |                      |             |
| Integrity Check Flag  | 0 (Default - No)        |                      |             |
| Logging Flag          | 1 (Yes)                 |                      |             |
| Stat. Collection Flag | 1 (Yes)                 |                      |             |
| Test Flag             | 0 (Default - No)        |                      |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |                      |             |
| Delivery Time Trigger | blank (Default)         |                      |             |
| Delivery Trig. Cond.  | blank (Default)         |                      |             |
| Original Source       | of Msg. Source AP       |                      |             |
| Channel ID            | of Msg. Source AP       |                      |             |
| Continuation Flag     | 0                       |                      |             |

DS 620142000  
1 November 1985

Message Type: Host Name Request

Type ID: HM

**Nature of Message:**

Sent as a result of an AP invoking the "WHTHST" Service.  
The data portion contains the name of the AP whose host  
name is being requested.

Path: AP - Local MPU

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | AP Name            | PIC X(10)          |
| Header Length         | 092                     |                    |                    |
| Data Length           | 0010                    |                    |                    |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 1                       |                    |                    |
| Message Type          | HM                      |                    |                    |
| AP Name (Dest.)       | Local MPU               |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Local APC               |                    |                    |
| AP Name (Source)      | Requesting AP           |                    |                    |
| Instance (Source)     | Assigned by MPU at Init |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | Given by AP Interface   |                    |                    |
| Message Category      | C                       |                    |                    |
| Priority of Source AP | From AP Char. Table     |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: Host Name Return

Type ID: NH

**Nature of Message:**

Sent in response to a Host Name Request Message. The data portion contains the name of the Host associated with the given AP.

Path: Local MPU - AP

| Header Fields         | Header Values             | Data Fields | Data Values |
|-----------------------|---------------------------|-------------|-------------|
| Header Format         | A                         | Host Name   | PIC X(3)    |
| Header Length         | 092                       | AP Name     | PIC X(10)   |
| Data Length           | 0013                      |             |             |
| Binary/Native Flag    | N (Default)               |             |             |
| Priority Flag         | 0                         |             |             |
| Message Type          | NH                        |             |             |
| AP Name (Dest.)       | Source of HN Message      |             |             |
| Instance (Dest.)      | Source Inst of HN Message |             |             |
| APC Name (Dest.)      | Local APC                 |             |             |
| AP Name (Source)      | Local MPU                 |             |             |
| Instance (Source)     | Det by SysGen Parameter   |             |             |
| APC Name (Source)     | Local APC                 |             |             |
| Message Serial #      | Filled in by Source MPU   |             |             |
| Processing Code       | 1                         |             |             |
| Message Category      | E                         |             |             |
| Priority of Source AP | From AP Char. Table       |             |             |
| Integrity Check Flag  | 0 (Default)               |             |             |
| Logging Flag          | 1                         |             |             |
| Stat. Collection Flag | 1                         |             |             |
| Test Flag             | 0 (Default)               |             |             |
| Delivery Trigger Flag | 0 (Default)               |             |             |
| Delivery Time Trigger | blank (Default)           |             |             |
| Delivery Trig. Cond.  | blank (Default)           |             |             |
| Original Source       | of Msg. Source AP         |             |             |
| Channel ID            | of Msg. Source AP         |             |             |
| Continuation Flag     | 0                         |             |             |

DS 620142000  
1 November 1985

Message Type: Host Status Request

Type ID: HR

**Nature of Message:**

Sent as a result of an AP invoking the "HSTATS" service.  
The data portion contains the name of the host whose  
status is of interest to the calling AP.

Path: AP - Local MPU

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | Host Name   | PIC X(3)    |
| Header Length         | 092                     |             |             |
| Data Length           | 0003                    |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 1                       |             |             |
| Message Type          | HR                      |             |             |
| AP Name (Dest.)       | Local MPU               |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Local APC               |             |             |
| AP Name (Source)      | Requesting AP           |             |             |
| Instance (Source)     | Assigned by MPU at Init |             |             |
| APC Name (Source)     | Local APC               |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | Given by AP Interface   |             |             |
| Message Category      | D                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | of Msg. Source AP       |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Host Status Return

Type ID: HO

**Nature of Message:**

Sent in response to a Host Status Request message. The data portion contains the current status of the Host named in the Host Status Request.

Path: Local MPU - AP

| Header Fields         | Header Values             | Data Fields | Data Values |
|-----------------------|---------------------------|-------------|-------------|
| Header Format         | A                         | Host Status | PIC X       |
| Header Length         | 092                       | Host Name   | PIC X(3)    |
| Data Length           | 0004                      |             |             |
| Binary/Native Flag    | N (Default)               |             |             |
| Priority Flag         | 0                         |             |             |
| Message Type          | HO                        |             |             |
| AP Name (Dest.)       | Source of HR Message      |             |             |
| Instance (Dest.)      | Source Inst of HR Message |             |             |
| APC Name (Dest.)      | Local APC                 |             |             |
| AP Name (Source)      | Local MPU                 |             |             |
| Instance (Source)     | Det by SysGen Parameter   |             |             |
| APC Name (Source)     | Local APC                 |             |             |
| Message Serial #      | Filled in by Source MPU   |             |             |
| Processing Code       | 1                         |             |             |
| Message Category      | F                         |             |             |
| Priority of Source AP | From AP Char. Table       |             |             |
| Integrity Check Flag  | 0 (Default)               |             |             |
| Logging Flag          | 1                         |             |             |
| Stat. Collection Flag | 1                         |             |             |
| Test Flag             | 0 (Default)               |             |             |
| Delivery Trigger Flag | 0 (Default)               |             |             |
| Delivery Time Trigger | blank (Default)           |             |             |
| Delivery Trig. Cond.  | blank (Default)           |             |             |
| Original Source       | of Msg. Source AP         |             |             |
| Channel ID            | of Msg. Source AP         |             |             |
| Continuation Flag     | 0                         |             |             |

DS 620142000  
1 November 1985

Message Type: Host Terminating

Type ID: HT

**Nature of Message:**

Message sent when a Non-VAX host shuts down.

Path: Monitor AP - Monitor AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         |             |
| Header Length         | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | HT                      |             |             |
| AP Name (Dest.)       | VAX Monitor AP          |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | VAX Monitor APC         |             |             |
| AP Name (Source)      | Non-VAX Monitor AP      |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Non-VAX Monitor APC     |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | F                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | Monitor AP Channel      |             |             |
| Continuation Flag     | 0                       |             |             |



DS 620142000  
1 November 1985

Message Type: Initiate COMM AP

Type ID: CI

Nature of Message:

Message requesting the initiation of a given COMM AP.

Path: Monitor AP - COMM AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         |             |
| Header Length         | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default - Native)    |             |             |
| Priority Flag         | 1                       |             |             |
| Message Type          | CI                      |             |             |
| AP Name (Dest.)       | COMM AP                 |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | COMM APC                |             |             |
| AP Name (Source)      | Monitor AP              |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Monitor's APC           |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | H                       |             |             |
| Priority of Source AP | 0 (Default)             |             |             |
| Integrity Check Flag  | 0 (Default - No)        |             |             |
| Logging Flag          | 1 (Yes)                 |             |             |
| Stat. Collection Flag | 1 (Yes)                 |             |             |
| Test Flag             | 0 (Default - No)        |             |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | COMM AP Channel         |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Link Active

Type ID: LA

**Nature of Message:**

Message from a COMM AP reporting the successful establishment of a link to its off-host sibling. Upon receipt, Monitor AP will update the link status table and send a "Host Available" message to the off-host monitor at the other end of the link.

Path: COMM AP to Monitor AP

| Header Fields         | Header Values           | Data Fields      | Data Values |
|-----------------------|-------------------------|------------------|-------------|
| Header Format         | A                       | N/A              |             |
| Header Length         | 092                     | Specific Link is |             |
| Data Length           | 0                       | implied by       |             |
| Binary/Native Flag    | N (Default)             | COMM AP Name     |             |
| Priority Flag         | 0                       |                  |             |
| Message Type          | LA                      |                  |             |
| Name (Dest.)          | Monitor AP              |                  |             |
| Instance (Dest.)      | Det by SysGen Parameter |                  |             |
| APC Name (Dest.)      | Monitor's APC           |                  |             |
| AP Name (Source)      | COMM AP                 |                  |             |
| Instance (Source)     | Det by SysGen Parameter |                  |             |
| APC Name (Source)     | COMM's APC              |                  |             |
| Message Serial #      | Filled in by Source MPU |                  |             |
| Processing Code       | 1                       |                  |             |
| Message Category      | I                       |                  |             |
| Priority of Source AP | 0                       |                  |             |
| Integrity Check Flag  | 0 (Default)             |                  |             |
| Logging Flag          | 1                       |                  |             |
| Stat. Collection Flag | 1                       |                  |             |
| Test Flag             | 0 (Default)             |                  |             |
| Delivery Trigger Flag | 0 (Default)             |                  |             |
| Delivery Time Trigger | blank (Default)         |                  |             |
| Delivery Trig. Cond.  | blank (Default)         |                  |             |
| Original Source       | Of Msg Source AP        |                  |             |
| Channel ID            | COMM AP Channel         |                  |             |
| Continuation Flag     | 0                       |                  |             |

DS 620142000  
1 November 1985

Message Type: Link Fail

Type ID: LF

**Nature of Message:**

Message from COMM AP informing Monitor that a formerly active link has gone down. This message type is also used as a return on a "Start Link" message.

Path: COMM AP - Monitor AP

| Header Fields         | Header Values           | Data Fields    | Data Values |
|-----------------------|-------------------------|----------------|-------------|
| Header Format         | A                       | N/A - The Link |             |
| Header Length         | 092                     | in question is |             |
| Data Length           | 0                       | implied by the |             |
| Binary/Native Flag    | N (Default)             | name of the    |             |
| Priority Flag         | 0                       | Source COMM AP |             |
| Message Type          | LF                      |                |             |
| AP Name (Dest.)       | Monitor AP              |                |             |
| Instance (Dest.)      | Det by SysGen Parameter |                |             |
| APC Name (Dest.)      | Monitor's APC           |                |             |
| AP Name (Source)      | COMM AP                 |                |             |
| Instance (Source)     | Det by SysGen Parameter |                |             |
| APC Name (Source)     | COMM's APC              |                |             |
| Message Serial #      | Filled in by Source MPU |                |             |
| Processing Code       | 1                       |                |             |
| Message Category      | I                       |                |             |
| Priority of Source AP | 0                       |                |             |
| Integrity Check Flag  | 0 (Default)             |                |             |
| Logging Flag          | 1                       |                |             |
| Stat. Collection Flag | 1                       |                |             |
| Test Flag             | 0 (Default)             |                |             |
| Delivery Trigger Flag | 0 (Default)             |                |             |
| Delivery Time Trigger | blank (Default)         |                |             |
| Delivery Trig. Cond.  | blank (Default)         |                |             |
| Original Source       | Of Msg Source AP        |                |             |
| Channel ID            | COMM AP Channel         |                |             |
| Continuation Flag     | 0                       |                |             |

DS 620142000  
1 November 1985

Message Type: List Request

Type ID: LR

**Nature of Message:**

Request from IISS Operator (via Monitor) for a list of all active APs on a specified AP Cluster.

Path: Monitor AP - MPU

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         | Header      |
| Length                | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 1                       |             |             |
| Message Type          | LR                      |             |             |
| AP Name (Dest.)       | Specified APC MPU       |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Specified APC           |             |             |
| AP Name (Source)      | Monitor AP              |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Monitor's APC           |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | D                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | APC's Channel           |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Logoff

Type ID: OF

**Nature of Message:**

Notification from UI that a given user has logged off the IISS System. Upon receipt of this message, Monitor AP will delete the relevant entry in the Logon Table.

Path: UI to Monitor AP

| Header Fields         | Header Values              | Data Fields  | Data Values |
|-----------------------|----------------------------|--------------|-------------|
| Header Format         | A                          | UI (AP) Name | PIC X(10)   |
| Header Length         | 092                        | UI APC Name  | PIC X(3)    |
| Data Length           | 0015                       | Terminal ID  | PIC X(2)    |
| Binary/Native Flag    | N (Default)                |              |             |
| Priority Flag         | 0                          |              |             |
| Message Type          | OF                         |              |             |
| AP Name (Dest.)       | Monitor AP                 |              |             |
| Instance (Dest.)      | Det by SysGen Parameter    |              |             |
| APC Name (Dest.)      | Monitor's APC              |              |             |
| AP Name (Source)      | UI AP                      |              |             |
| Instance (Source)     | Assigned by MPU at AP Init |              |             |
| APC Name (Source)     | UI's APC                   |              |             |
| Message Serial #      | Filled in by Source MPU    |              |             |
| Processing Code       | Given by AP Int            |              |             |
| Message Category      | E                          |              |             |
| Priority of Source AP | 0                          |              |             |
| Integrity Check Flag  | 0 (Default)                |              |             |
| Logging Flag          | 1                          |              |             |
| Stat. Collection Flag | 1                          |              |             |
| Test Flag             | 0 (Default)                |              |             |
| Delivery Trigger Flag | 0 (Default)                |              |             |
| Delivery Time Trigger | blank (Default)            |              |             |
| Delivery Trig. Cond.  | blank (Default)            |              |             |
| Original Source       | of Msg. Source AP          |              |             |
| Channel ID            | of Msg. Source AP          |              |             |
| Continuation Flag     | 0                          |              |             |

DS 620142000  
1 November 1985

Message Type: Logon Request

Type ID: LO

**Nature of Message:**

Message from a UI AP informing Monitor AP of a successful Logon. Upon receipt of this message, Monitor will transfer the data portion to the Logon Table.

Path: UI AP - Monitor AP

| Header Fields         | Header Values                  | Data Fields   | Data Values |
|-----------------------|--------------------------------|---------------|-------------|
| Header Format         | A                              | UI (AP) Name  | PIC X(10)   |
| Header Length         | 092                            | UI APC Name   | PIC X(3)    |
| Data Length           | 0062                           | Terminal ID   | PIC X(2)    |
| Binary/Native Flag    | N (Default)                    | User Name     | PIC X(8)    |
| Priority Flag         | 0                              | Role Name     | PIC X(10)   |
| Message Type          | LO                             | Session Start | PIC X(23)   |
| AP Name (Dest.)       | Monitor AP                     | Time          |             |
| Instance (Dest.)      | Det by SysGen                  | Channel Range | PIC X(3)    |
|                       | Parameter                      | Start         |             |
| APC Name (Dest.)      | Monitor's APC                  |               |             |
| AP Name (Source)      | UI AP                          | Channel Range | PIC X(3)    |
| Instance (Source)     | Assigned by MPU at AP Init End |               |             |
| APC Name (Source)     | UI's APC                       |               |             |
| Message Serial #      | Filled in by Source MPU        |               |             |
| Processing Code       | Given by AP Int                |               |             |
| Message Category      | E                              |               |             |
| Priority of Source AP | 0                              |               |             |
| Integrity Check Flag  | 0 (Default)                    |               |             |
| Logging Flag          | 1                              |               |             |
| Stat. Collection Flag | 1                              |               |             |
| Test Flag             | 0 (Default)                    |               |             |
| Delivery Trigger Flag | 0 (Default)                    |               |             |
| Delivery Time Trigger | blank (Default)                |               |             |
| Delivery Trig. Cond.  | blank (Default)                |               |             |
| Original Source       | of Msg. Source AP              |               |             |
| Channel ID            | of Msg. Source AP              |               |             |
| Continuation Flag     | 0                              |               |             |

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1 November 1985

Message Type: Message After Timeout

Type ID: MT

**Nature of Message:**

Message to Monitor that a reply message on a given message pair arrived after timeout had expired.

Path: MPU - Monitor AP

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | Header of Tardy    | PIC X(92)          |
| Header Length         | 092                     | Message            |                    |
| Data Length           | 0092                    |                    |                    |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | MT                      |                    |                    |
| AP Name (Dest.)       | Monitor AP              |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Monitor's APC           |                    |                    |
| AP Name (Source)      | Pair Request Source MPU |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | 0                       |                    |                    |
| Message Category      | E                       |                    |                    |
| Priority of Source AP | 0                       |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

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Message Type: Logon Response

Type ID: LX

**Nature of Message:**

Sent to inform the UI of the status of the LOGON Table  
upon completion of processing the Logon Message.

Path: Monitor AP - UI

| Header Fields         | Header Values           | Data Fields         | Data Values |
|-----------------------|-------------------------|---------------------|-------------|
| Log                   |                         |                     |             |
| Header Format         | A                       | Table Status        | PIC X       |
| Header Length         | 092                     | 88 Entry-Made Value | "1"         |
| Data Length           | 0001                    | 88 Table-Full Value | "0"         |
| Binary/Native Flag    | N (Default)             |                     |             |
| Priority Flag         | 1                       |                     |             |
| Message Type          | LX                      |                     |             |
| AP Name (Dest.)       | Source of Logon Message |                     |             |
| Instance (Dest.)      | Det by SysGen Parameter |                     |             |
| APC Name (Dest.)      | Logon Source APC        |                     |             |
| AP Name (Source)      | VAX Monitor AP          |                     |             |
| Instance (Source)     | Det by SysGen Parameter |                     |             |
| APC Name (Source)     | Monitor AP's APC        |                     |             |
| Message Serial #      | Filled in by Source MPU |                     |             |
| Processing Code       | 1                       |                     |             |
| Message Category      | E                       |                     |             |
| Priority of Source AP | From AP Char. Table     |                     |             |
| Integrity Check Flag  | 0 (Default)             |                     |             |
| Logging Flag          | 1                       |                     |             |
| Stat. Collection Flag | 1                       |                     |             |
| Test Flag             | 0 (Default)             |                     |             |
| Delivery Trigger Flag | 0 (Default)             |                     |             |
| Delivery Time Trigger | blank (Default)         |                     |             |
| Delivery Trig. Cond.  | blank (Default)         |                     |             |
| Original Source       | of Msg. Source AP       |                     |             |
| Channel ID            | UIV                     |                     |             |
| Continuation Flag     | 0                       |                     |             |



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Message Type: Message Manager ACK\*

Type ID: MA

**Nature of Message:**

Acknowledgement from the MPU that the message from the source AP was found to be acceptable. The entire header from the accepted message is returned to be used later by the source AP.

Path: Local MPU - Msg. Source AP

| Header Fields         | Header Values              | Data Fields   | Data Values |
|-----------------------|----------------------------|---------------|-------------|
| Header Format         | A                          | Entire header | PIC X(92)   |
| Header Length         | 092                        | of Accepted   |             |
| Data Length           | 0092                       | Message       |             |
| Binary/Native Flag    | N (Default)                |               |             |
| Priority Flag         | 0                          |               |             |
| Message Type          | MA                         |               |             |
| AP Name (Dest.)       | Source AP                  |               |             |
| Instance (Dest.)      | Assigned by MPU at AP Init |               |             |
| APC Name (Dest.)      | Source AP's APC            |               |             |
| AP Name (Source)      | Local MPU                  |               |             |
| Instance (Source)     | Det by SysGen Parameter    |               |             |
| APC Name (Source)     | Local APC                  |               |             |
| Message Serial #      | Filled in by Source MPU    |               |             |
| Processing Code       | 1                          |               |             |
| Message Category      | E                          |               |             |
| Priority of Source AP | 0                          |               |             |
| Integrity Check Flag  | 0 (Default)                |               |             |
| Logging Flag          | 1                          |               |             |
| Stat. Collection Flag | 1                          |               |             |
| Test Flag             | 0 (Default)                |               |             |
| Delivery Trigger Flag | 0 (Default)                |               |             |
| Delivery Time Trigger | blank (Default)            |               |             |
| Delivery Trig. Cond.  | blank (Default)            |               |             |
| Original Source       | of Msg. Source AP          |               |             |
| Channel ID            | of Msg. Source AP          |               |             |
| Continuation Flag     | 0                          |               |             |

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1 November 1985

Message Type: Message No Accept\*

Type ID: ME

**Nature of Message:**

Notification that a given message cannot be accepted. Message is logged and thrown away. The message source is informed of the problem via the error code parameter. In certain cases, the Monitor AP will also be informed of the problem.

Path: Local MPU - Source AP

| Header Fields         | Header Values              | Data Fields            | Data Values |
|-----------------------|----------------------------|------------------------|-------------|
| Header Format         | A                          | Message Error PIC X(5) |             |
| Header Length         | 092                        | Code                   |             |
| Data Length           | 0097                       |                        |             |
| Binary/Native Flag    | N (Default)                | Entire Original Header | PIC X (92)  |
| Priority Flag         | 0                          |                        |             |
| Message Type          | ME                         |                        |             |
| AP Name (Dest.)       | Source AP of MACK's Msg    |                        |             |
| Instance (Dest.)      | Assigned by MPU at AP Init |                        |             |
| APC Name (Dest.)      | Source AP's APC            |                        |             |
| AP Name (Source)      | Local MPU                  |                        |             |
| Instance (Source)     | Det by SysGen Parameter    |                        |             |
| APC Name (Source)     | Local APC                  |                        |             |
| Message Serial #      | Filled in by Source MPU    |                        |             |
| Processing Code       | 1                          |                        |             |
| Message Category      | E                          |                        |             |
| Priority of Source AP | From AP Char. Table        |                        |             |
| Integrity Check Flag  | 0 (Default)                |                        |             |
| Logging Flag          | 1                          |                        |             |
| Stat. Collection Flag | 1                          |                        |             |
| Test Flag             | 0 (Default)                |                        |             |
| Delivery Trigger Flag | 0 (Default)                |                        |             |
| Delivery Time Trigger | blank (Default)            |                        |             |
| Delivery Trig. Cond.  | blank (Default)            |                        |             |
| Original Source       | of Msg. Source AP          |                        |             |
| Channel ID            | of Msg. Source AP          |                        |             |
| Continuation Flag     | 0                          |                        |             |

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1 November 1985

Message Type: Message Queued for  
Unavailable APC\*

Type ID: MQ

**Nature of Message:**

Message informing the Operator that a message is being  
held for an AP residing on a currently unavailable APC.  
The operator may choose to start the APC.

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | Status Code | PIC X(5)    |
| Header Length         | 092                     | Name String | PIC X(7)    |
| Data Length           | 0017                    | Processing  | PIC X(5)    |
| Binary/Native Flag    | N (Default)             | Code        |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | MQ                      |             |             |
| AP Name (Dest.)       | Monitor AP              |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Monitor's APC           |             |             |
| AP Name (Source)      | Msg. Source MPU         |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Msg. Source APC         |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | E                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | of Msg. Source AP       |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Message Receive ACK

Type ID: RA

**Nature of Message:**

Sent to acknowledge the receipt of a message by the message's destination AP. Note: This message type may be used to acknowledge those requiring Guaranteed Delivery Services.

Path: AP - AP

| <u>Header Fields</u>  | <u>Header Values</u>       | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|----------------------------|--------------------|--------------------|
| Header Format         | A                          | APC Name (from     | PIC X(3)           |
| Header Length         | 092                        | Rec'd Msg)         |                    |
| Data Length           | 0010                       |                    |                    |
| Binary/Native Flag    | N (Default)                | Msg Serial #       | PIC X(7)           |
| Priority Flag         | 0                          | (from Rec'd Msg)   |                    |
| Message Type          | RA                         |                    |                    |
| AP Name (Dest.)       | Ack'd Msg Source AP        |                    |                    |
| Instance (Dest.)      | Ack'd Msg Source Instance  |                    |                    |
| APC Name (Dest.)      | Ack'd Msg Source APC       |                    |                    |
| AP Name (Source)      | Receiving AP               |                    |                    |
| Instance (Source)     | Assigned by MPU at AP Init |                    |                    |
| APC Name (Source)     | Local APC                  |                    |                    |
| Message Serial #      | Filled in by Source MPU    |                    |                    |
| Processing Code       | Given by AP Interface      |                    |                    |
| Message Category      | F                          |                    |                    |
| Priority of Source AP | From AP Char. Table        |                    |                    |
| Integrity Check Flag  | 0 (Default)                |                    |                    |
| Logging Flag          | 1                          |                    |                    |
| Stat. Collection Flag | 1                          |                    |                    |
| Test Flag             | 0 (Default)                |                    |                    |
| Delivery Trigger Flag | 0 (Default)                |                    |                    |
| Delivery Time Trigger | blank (Default)            |                    |                    |
| Delivery Trig. Cond.  | blank (Default)            |                    |                    |
| Original Source       | from Rec'd Msg             |                    |                    |
| Channel ID            | from Rec'd Msg             |                    |                    |
| Continuation Flag     | 0                          |                    |                    |

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1 November 1985

Message Type: Off-Host Shutting Down

Type ID: HS

**Nature of Message:**

Message from Monitor to its on-host APC's to inform them of an off-host shutdown. The APC MPU's can then take appropriate action as required (e.g., not trying to route and send a message to the shutdown host).

Path: Monitor AP - MPU

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u>     | <u>Data Values</u> |
|-----------------------|-------------------------|------------------------|--------------------|
| Header Format         | A                       | Host Name (of PIC X(3) |                    |
| Header Length         | 092                     | host shutting          |                    |
| Data Length           | 0003                    | down)                  |                    |
| Binary/Native Flag    | N (Default - Native)    |                        |                    |
| Priority Flag         | 1                       |                        |                    |
| Message Type          | HS                      |                        |                    |
| AP Name (Dest.)       | On-Host APC MPU         |                        |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                        |                    |
| APC Name (Dest.)      | Dest. MPU's APC         |                        |                    |
| AP Name (Source)      | Monitor AP              |                        |                    |
| Instance (Source)     | Det by SysGen Parameter |                        |                    |
| APC Name (Source)     | Local APC               |                        |                    |
| Message Serial #      | Filled in by Source MPU |                        |                    |
| Processing Code       | 1                       |                        |                    |
| Message Category      | C                       |                        |                    |
| Priority of Source AP | 0 (Default)             |                        |                    |
| Integrity Check Flag  | 0 (Default - No)        |                        |                    |
| Logging Flag          | 1 (Yes)                 |                        |                    |
| Stat. Collection Flag | 1 (Yes)                 |                        |                    |
| Test Flag             | 0 (Default - No)        |                        |                    |
| Delivery Trigger Flag | 0 (Default - Immed)     |                        |                    |
| Delivery Time Trigger | blank (Default)         |                        |                    |
| Delivery Trig. Cond.  | blank (Default)         |                        |                    |
| Original Source       | of Msg. Source AP       |                        |                    |
| Channel ID            | of Msg. Source AP       |                        |                    |
| Continuation Flag     | 0                       |                        |                    |

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1 November 1985

Message Type: Operator Abort

Type ID: OA

**Nature of Message:**

Command from the Operator telling the MPU to abort a specific instance of an AP. The MPU will handle the abort in the manner specified for "Abort AP."

Path: Monitor AP - MPU

| Header Fields         | Header Values           | Data Fields                                   | Data Values |
|-----------------------|-------------------------|-----------------------------------------------|-------------|
| Header Format         | A                       | AP Name (of AP to be aborted)                 | PIC X(10)   |
| Header Length         | 092                     |                                               |             |
| Data Length           | 0012                    |                                               |             |
| Binary/Native Flag    | N (Default)             | Instance (known to Operator from Active List) | PIC X(2)    |
| Priority Flag         | 1                       |                                               |             |
| Message Type          | OA                      |                                               |             |
| AP Name (Dest.)       | "Aborting" AP's MPU     |                                               |             |
| Instance (Dest.)      | Det by SysGen Parameter |                                               |             |
| APC Name (Dest.)      | MPU's APC               |                                               |             |
| AP Name (Source)      | Monitor AP              |                                               |             |
| Instance (Source)     | Det by SysGen Parameter |                                               |             |
| APC Name (Source)     | Local APC               |                                               |             |
| Message Serial #      | Filled in by Source MPU |                                               |             |
| Processing Code       | 1                       |                                               |             |
| Message Category      | C                       |                                               |             |
| Priority of Source AP | From AP Char. Table     |                                               |             |
| Integrity Check Flag  | 0 (Default)             |                                               |             |
| Logging Flag          | 1                       |                                               |             |
| Stat. Collection Flag | 1                       |                                               |             |
| Test Flag             | 0 (Default)             |                                               |             |
| Delivery Trigger Flag | 0 (Default)             |                                               |             |
| Delivery Time Trigger | blank (Default)         |                                               |             |
| Delivery Trig. Cond.  | blank (Default)         |                                               |             |
| Original Source       | of Msg. Source AP       |                                               |             |
| Channel ID            | of Msg. Source AP       |                                               |             |
| Continuation Flag     | 0                       |                                               |             |

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1 November 1985

Message Type: Paired Message Status Request      Type ID: MS

**Nature of Message:**

Sent as a result of an AP invoking the "PRSTAT" Service.  
The data portion contains the parameters given in the  
call.

Path: AP - Local MPU

| Header Fields         | Header Values           | Data Fields    | Data Values |
|-----------------------|-------------------------|----------------|-------------|
| Header Format         | A                       | Paired Message | PIC X(10)   |
| Header Length         | 092                     | Destination    |             |
| Data Length           | 0013                    | AP Name        |             |
| Binary/Native Flag    | N (Default)             | Paired Message | PIC X(3)    |
| Priority Flag         | 1                       | Logical        |             |
| Message Type          | MS                      | Channel        |             |
| AP Name (Dest.)       | Local MPU               |                |             |
| Instance (Dest.)      | Det by SysGen Parameter |                |             |
| APC Name (Dest.)      | Local APC               |                |             |
| AP Name (Source)      | Requesting AP           |                |             |
| Instance (Source)     | Assigned by MPU at Init |                |             |
| APC Name (Source)     | Local APC               |                |             |
| Message Serial #      | Filled in by Source MPU |                |             |
| Processing Code       | Given by AP Interface   |                |             |
| Message Category      | D                       |                |             |
| Priority of Source AP | From AP Char. Table     |                |             |
| Integrity Check Flag  | 0 (Default)             |                |             |
| Logging Flag          | 1                       |                |             |
| Stat. Collection Flag | 1                       |                |             |
| Test Flag             | 0 (Default)             |                |             |
| Delivery Trigger Flag | 0 (Default)             |                |             |
| Delivery Time Trigger | blank (Default)         |                |             |
| Delivery Trig. Cond.  | blank (Default)         |                |             |
| Original Source       | of Msg. Source AP       |                |             |
| Channel ID            | of Msg. Source AP       |                |             |
| Continuation Flag     | 0                       |                |             |

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1 November 1985

Message Type: Paired Message Status Return

Type ID: MR

**Nature of Message:**

Sent in response to a Paired Message Status Request. The data portion contains the current status of the Paired Message specified in the request.

Path: Local MPU - AP

| Header Fields         | Header Values             | Data Fields | Data Values |
|-----------------------|---------------------------|-------------|-------------|
| Header Format         | A                         | Return Code | PIC X(5)    |
| Header Length         | 092                       |             | 88 Message- |
| Data Length           | 0005                      |             | in-system   |
| Binary/Native Flag    | N (Default)               |             | 88 Message- |
| Priority Flag         | 0                         |             | Not-Found   |
| Message Type          | MR                        |             |             |
| AP Name (Dest.)       | Source of MS Message      |             |             |
| Instance (Dest.)      | Source Inst of MS Message |             |             |
| APC Name (Dest.)      | Local APC                 |             |             |
| AP Name (Source)      | Local MPU                 |             |             |
| Instance (Source)     | Det by SysGen Parameter   |             |             |
| APC Name (Source)     | Local APC                 |             |             |
| Message Serial #      | Filled in by Source MPU   |             |             |
| Processing Code       | 1                         |             |             |
| Message Category      | F                         |             |             |
| Priority of Source AP | From AP Char. Table       |             |             |
| Integrity Check Flag  | 0 (Default)               |             |             |
| Logging Flag          | 1                         |             |             |
| Stat. Collection Flag | 1                         |             |             |
| Test Flag             | 0 (Default)               |             |             |
| Delivery Trigger Flag | 0 (Default)               |             |             |
| Delivery Time Trigger | blank (Default)           |             |             |
| Delivery Trig. Cond.  | blank (Default)           |             |             |
| Original Source       | of Msg. Source AP         |             |             |
| Channel ID            | of Msg. Source AP         |             |             |
| Continuation Flag     | 0                         |             |             |



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1 November 1985

Message Type: Process Name Not Found

Type ID: NP

**Nature of Message:**

Sent by an MPU when it cannot find an AP specified to be aborted in the AP Status Table. This is a possible response to an Operator Abort Message.

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | AP Name       | PIC X(10)   |
| Header Length         | 092                     | (specified in |             |
| Data Length           | 0012                    | OA Msg)       |             |
| Binary/Native Flag    | N (Default - Native)    |               |             |
| Priority Flag         | 0                       | Instance      | PIC X(2)    |
| Message Type          | NP                      | (specified in |             |
| AP Name (Dest.)       | Monitor AP              | OA Msg)       |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | Monitor's APC           |               |             |
| AP Name (Source)      | Aborting AP's MPU       |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Local APC               |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | E                       |               |             |
| Priority of Source AP | 0 (Default)             |               |             |
| Integrity Check Flag  | 0 (Default - No)        |               |             |
| Logging Flag          | 1 (Yes)                 |               |             |
| Stat. Collection Flag | 1 (Yes)                 |               |             |
| Test Flag             | 0 (Default - No)        |               |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | of Msg. Source AP       |               |             |
| Continuation Flag     | 0                       |               |             |

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1 November 1985

Message Type: Processing Error\*

Type ID: 31

**Nature of Message:**

Message sent from an MPU when it encounters problems during its normal processing. The header portion is hard coded in the event that the problem encountered is within the MPU itself.

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields     | Data Values |
|-----------------------|-------------------------|-----------------|-------------|
| Header Format         | A                       | Error Code      | PIC X(5)    |
| Header Length         | 092                     |                 |             |
| Data Length           | 0017                    | Name String     | PIC X(7)    |
| Binary/Native Flag    | N (Default - Native)    |                 |             |
| Priority Flag         | 0                       | Processing Code | PIC X(5)    |
| Message Type          | 31                      |                 |             |
| AP Name (Dest.)       | Monitor AP              |                 |             |
| Instance (Dest.)      | Det by SysGen Parameter |                 |             |
| APC Name (Dest.)      | Monitor's APC           |                 |             |
| AP Name (Source)      | Local MPU               |                 |             |
| Instance (Source)     | Det by SysGen Parameter |                 |             |
| APC Name (Source)     | Local APC               |                 |             |
| Message Serial #      | Filled in by Source MPU |                 |             |
| Processing Code       | 1                       |                 |             |
| Message Category      | E                       |                 |             |
| Priority of Source AP | 0 (Default)             |                 |             |
| Integrity Check Flag  | 0 (Default - No)        |                 |             |
| Logging Flag          | 1 (Yes)                 |                 |             |
| Stat. Collection Flag | 1 (Yes)                 |                 |             |
| Test Flag             | 0 (Default - No)        |                 |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |                 |             |
| Delivery Time Trigger | blank (Default)         |                 |             |
| Delivery Trig. Cond.  | blank (Default)         |                 |             |
| Original Source       | of Msg. Source AP       |                 |             |
| Channel ID            | of Msg. Source AP       |                 |             |
| Continuation Flag     | 0                       |                 |             |

Message Type: Rebuild Tables

Type ID: RT

**Nature of Message:**

Used on Startup by Monitor to inform an MPU that it must rebuild its tables from the CDM. This message applies only to those MPU's that must build their tables before the CDMRP comes up. It is used only where there is a table configuration change.

Path: Monitor - MPU

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         |             |
| Header Length         | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default - Native)    |             |             |
| Priority Flag         | 1                       |             |             |
| Message Type          | RT                      |             |             |
| AP Name (Dest.)       | MPU                     |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | MPU's APC               |             |             |
| AP Name (Source)      | Monitor AP              |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Monitor's APC           |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | D                       |             |             |
| Priority of Source AP | 0 (Default)             |             |             |
| Integrity Check Flag  | 0 (Default - No)        |             |             |
| Logging Flag          | 1 (Yes)                 |             |             |
| Stat. Collection Flag | 1 (Yes)                 |             |             |
| Test Flag             | 0 (Default - No)        |             |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | specified or default    |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Recoverable Error

Type ID: RE

Nature of Message:

Notification that a given AP has encountered a recoverable error.

Path: AP - Monitor AP

| Header Fields         | Header Values              | Data Fields   | Data Values |
|-----------------------|----------------------------|---------------|-------------|
| Header Format         | A                          | AP Error Code | PIC X(5)    |
| Header Length         | 092                        |               |             |
| Data Length           | 0005                       |               |             |
| Binary/Native Flag    | N (Default)                |               |             |
| Priority Flag         | 0                          |               |             |
| Message Type          | RE                         |               |             |
| AP Name (Dest.)       | Monitor AP                 |               |             |
| Instance (Dest.)      | Det by SysGen Parameter    |               |             |
| APC Name (Dest.)      | Monitor's APC              |               |             |
| AP Name (Source)      | AP where error occurred    |               |             |
| Instance (Source)     | Assigned by MPU at AP Init |               |             |
| APC Name (Source)     | AP's APC                   |               |             |
| Message Serial #      | Filled in by Source MPU    |               |             |
| Processing Code       | Given by AP Interface      |               |             |
| Message Category      | E                          |               |             |
| Priority of Source AP | From AP Char. Table        |               |             |
| Integrity Check Flag  | 0 (Default)                |               |             |
| Logging Flag          | 1                          |               |             |
| Stat. Collection Flag | 1                          |               |             |
| Test Flag             | 0 (Default)                |               |             |
| Delivery Trigger Flag | 0 (Default)                |               |             |
| Delivery Time Trigger | blank (Default)            |               |             |
| Delivery Trig. Cond.  | blank (Default)            |               |             |
| Original Source       | of Source AP               |               |             |
| Channel ID            | of Source AP               |               |             |
| Continuation Flag     | 0                          |               |             |

DS 620142000  
1 November 1985

Message Type: Resource Unavailable\*

Type ID: 33

**Nature of Message:**

Informational message sent to Monitor AP when an MPU rejects any message due to the fact of a needed resource being unavailable.

Path: MPU - Monitor

| Header Fields         | Header Values           | Data Fields     | Data Values |
|-----------------------|-------------------------|-----------------|-------------|
| Header Format         | A                       | Error Code      | PIC X(5)    |
| Header Length         | 092                     |                 |             |
| Data Length           | 0017                    | Name String     | PIC X(7)    |
| Binary/Native Flag    | N (Default - Native)    |                 |             |
| Priority Flag         | 0                       | Processing Code | PIC X(5)    |
| Message Type          | 33                      |                 |             |
| AP Name (Dest.)       | Monitor AP              |                 |             |
| Instance (Dest.)      | Det by SysGen Parameter |                 |             |
| APC Name (Dest.)      | Monitor's APC           |                 |             |
| AP Name (Source)      | MPU                     |                 |             |
| Instance (Source)     | Det by SysGen Parameter |                 |             |
| APC Name (Source)     | MPU's APC               |                 |             |
| Message Serial #      | Filled in by Source MPU |                 |             |
| Processing Code       | 1                       |                 |             |
| Message Category      | E                       |                 |             |
| Priority of Source AP | 0 (Default)             |                 |             |
| Integrity Check Flag  | 0 (Default - No)        |                 |             |
| Logging Flag          | 1 (Yes)                 |                 |             |
| Stat. Collection Flag | 1 (Yes)                 |                 |             |
| Test Flag             | 0 (Default - No)        |                 |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |                 |             |
| Delivery Time Trigger | blank (Default)         |                 |             |
| Delivery Trig. Cond.  | blank (Default)         |                 |             |
| Original Source       | of Msg. Source AP       |                 |             |
| Channel ID            | of Msg. Source AP       |                 |             |
| Continuation Flag     | 0                       |                 |             |

DS 620142000  
1 November 1985

Message Type: Shutdown AP

Type ID: DA

**Nature of Message:**

Command to an MPU telling it to shut down one of its resident APs. The MPU will handle the actual shutdown in accordance with the given AP's characteristics. Where the given AP has active child AP's, the MPU will also send shutdown AP messages to the child AP MPUs.

Path: Monitor AP - MPU; MPU - MPU

| Header Fields         | Header Values               | Data Fields               | Data Values |
|-----------------------|-----------------------------|---------------------------|-------------|
| Header Format         | A                           | AP Name (to be shut down) | PIC X(10)   |
| Header Length         | 092                         | Instance                  | PIC X(2)    |
| Data Length           | 0015                        | (where known)             |             |
| Binary/Native Flag    | N (Default)                 | Channel ID                | PIC X(3)    |
| Priority Flag         | 1                           |                           |             |
| Message Type          | DA                          |                           |             |
| AP Name (Dest.)       | Shutting down AP's MPU      |                           |             |
| Instance (Dest.)      | Det by SysGen Parameter     |                           |             |
| APC Name (Dest.)      | AP's APC                    |                           |             |
| AP Name (Source)      | Monitor AP or Parent AP MPU |                           |             |
| Instance (Source)     | Det by SysGen Parameter     |                           |             |
| APC Name (Source)     | Local APC                   |                           |             |
| Message Serial #      | Filled in by Source MPU     |                           |             |
| Processing Code       | 1                           |                           |             |
| Message Category      | C                           |                           |             |
| Priority of Source AP | From AP Char. Table         |                           |             |
| Integrity Check Flag  | 0 (Default)                 |                           |             |
| Logging Flag          | 1                           |                           |             |
| Stat. Collection Flag | 1                           |                           |             |
| Test Flag             | 0 (Default)                 |                           |             |
| Delivery Trigger Flag | 0 (Default)                 |                           |             |
| Delivery Time Trigger | blank (Default)             |                           |             |
| Delivery Trig. Cond.  | blank (Default)             |                           |             |
| Original Source       | of Msg. Source AP           |                           |             |
| Channel ID            | of Msg. Source AP           |                           |             |
| Continuation Flag     | 0                           |                           |             |

DS 620142000  
1 November 1985

Message Type: Shutdown AP Cluster

Type ID: DC

**Nature of Message:**

System Command to gracefully shut down a given cluster. Implies that the cluster's MPU will handle the shutdown of all resident AP's and will also shut itself down after all AP's and messages are cleared. Where resident AP's have child AP's and the shutdown type; host or APC, the MPU will also send shutdown AP messages to the child AP MPU's (where the child AP's are off-APC).

Path: Monitor AP - MPU

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | Shutdown Type | PIC X       |
| Header Length         | 092                     |               | 88 IISS     |
| Data Length           | 0001                    |               | 88 Host     |
| Binary/Native Flag    | N (Default)             |               | 88 APC      |
| Priority Flag         | 1                       |               |             |
| Message Type          | DC                      |               |             |
| AP Name (Dest.)       | MPU                     |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | MPU's APC               |               |             |
| AP Name (Source)      | Monitor AP              |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Monitor's APC           |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | D                       |               |             |
| Priority of Source AP | From AP Char. Table     |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | specified or default    |               |             |
| Continuation Flag     | 0                       |               |             |

DS 620142000  
1 November 1985

Message Type: Shutdown COMM AP

Type ID: TR

Nature of Message:

Message to a given COMM AP telling it to shut itself down.

Path: Monitor AP - COMM AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         |             |
| Header Length         | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default - Native)    |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | TR                      |             |             |
| AP Name (Dest.)       | COMM AP                 |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | COMM's APC              |             |             |
| AP Name (Source)      | Monitor AP              |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Monitor's APC           |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | E                       |             |             |
| Priority of Source AP | 0 (Default)             |             |             |
| Integrity Check Flag  | 0 (Default - No)        |             |             |
| Logging Flag          | 1 (Yes)                 |             |             |
| Stat. Collection Flag | 1 (Yes)                 |             |             |
| Test Flag             | 0 (Default - No)        |             |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | COMM AP's Channel       |             |             |
| Continuation Flag     | 0                       |             |             |



DS 620142000  
1 November 1985

Message Type: Shutdown Host

Type ID: SH

**Nature of Message:**

System command from one Monitor AP to an off-host sibling telling the sibling to shutdown all IISS functionality on its host. The off-host Monitor AP will, upon receipt, send Shutdown APC messages to all of its on-host APC's.

Path: Monitor AP - Monitor AP

| Header Fields         | Header Values           | Data Fields    | Data Values |
|-----------------------|-------------------------|----------------|-------------|
| Header Format         | A                       | N/A - Host to  |             |
| Header Length         | 092                     | be shutdown is |             |
| Data Length           | 0                       | implied by     |             |
| Binary/Native Flag    | N (Default)             | Dest. Monitor  |             |
| Priority Flag         | 0                       | AP Name        |             |
| Message Type          | SH                      |                |             |
| AP Name (Dest.)       | Off-host Monitor AP     |                |             |
| Instance (Dest.)      | Det by SysGen Parameter |                |             |
| APC Name (Dest.)      | Off-Host Monitor's APC  |                |             |
| AP Name (Source)      | On-host Monitor AP      |                |             |
| Instance (Source)     | Det by SysGen Parameter |                |             |
| APC Name (Source)     | Monitor's APC           |                |             |
| Message Serial #      | Filled in by Source MPU |                |             |
| Processing Code       | 1                       |                |             |
| Message Category      | B                       |                |             |
| Priority of Source AP | 0                       |                |             |
| Integrity Check Flag  | 0 (Default)             |                |             |
| Logging Flag          | 1                       |                |             |
| Stat. Collection Flag | 1                       |                |             |
| Test Flag             | 0 (Default)             |                |             |
| Delivery Trigger Flag | 0 (Default)             |                |             |
| Delivery Time Trigger | blank (Default)         |                |             |
| Delivery Trig. Cond.  | blank (Default)         |                |             |
| Original Source       | of Msg. Source AP       |                |             |
| Channel ID            | of Msg. Source AP       |                |             |
| Continuation Flag     | 0                       |                |             |

DS 620142000  
1 November 1985

Message Type: Shutdown Link

Type ID: SD

Nature of Message:

Command to terminate an active link between a COMM AP and its off-host sibling.

Path: Monitor AP - COMM AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         |             |
| Header Length         | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | SD                      |             |             |
| AP Name (Dest.)       | COMM AP                 |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | COMM's APC              |             |             |
| AP Name (Source)      | Monitor AP              |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Local APC               |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | B                       |             |             |
| Priority of Source AP | 0                       |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | COMM AP's Channel       |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Signal Table Error

Type ID: SE

**Nature of Message:**

Sent to the message source AP on the occurrence of an entry-not-found in the NTM Tables. This message is sent only when the error creates a situation where the source AP's message cannot be processed. The message contains a brief description of the error and where it occurred.

Path: MPU      AP

| Header Fields         | Header Values                   | Data Fields  | Data Values |
|-----------------------|---------------------------------|--------------|-------------|
| Header Format         | A                               | Error Source | PIC X(10)   |
| Header Length         | 092                             | NTM Error    |             |
| Data Length           | 0087                            | Return       | PIC X(5)    |
| Binary/Native Flag    | N (Default)                     | Error        |             |
| Priority Flag         | 0                               | Description  | PIC X(72)   |
| Message Type          | SE                              |              |             |
| AP Name (Dest.)       | Source of Message Causing Error |              |             |
| Instance (Dest.)      | Det by SysGen Parameter         |              |             |
| APC Name (Dest.)      | Source Msg APC                  |              |             |
| AP Name (Source)      | MPU where error occurred        |              |             |
| Instance (Source)     | Det by SysGen Parameter         |              |             |
| APC Name (Source)     | Local APC                       |              |             |
| Message Serial #      | Filled in by Source MPU         |              |             |
| Processing Code       | 1                               |              |             |
| Message Category      | E                               |              |             |
| Priority of Source AP | From AP Char. Table             |              |             |
| Integrity Check Flag  | 0 (Default)                     |              |             |
| Logging Flag          | 1                               |              |             |
| Stat. Collection Flag | 1                               |              |             |
| Test Flag             | 0 (Default)                     |              |             |
| Delivery Trigger Flag | 0 (Default)                     |              |             |
| Delivery Time Trigger | blank (Default)                 |              |             |
| Delivery Trig. Cond.  | blank (Default)                 |              |             |
| Original Source       | of Msg. Source AP               |              |             |
| Channel ID            | 000                             |              |             |
| Continuation Flag     | 0                               |              |             |

DS 620142000  
1 November 1985

Message Type: Shutdown Pending

Type ID: SP

**Nature of Message:**

Notification that an IISS shutdown of a specified type will begin in X minutes. This notification may be overridden by a cancel shutdown (CS) Message.

Path: Monitor AP - UI AP

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | Shutdown Data | PIC X(2)    |
| Header Length         | 092                     | Time Until    | PIC X(2)    |
| Data Length           | 0004                    | Shutdown      |             |
| Binary/Native Flag    | N (Default)             | (in Minutes)  |             |
| Priority Flag         | 1                       |               |             |
| Message Type          | SP                      |               |             |
| AP Name (Dest.)       | UI MPU                  |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | UI's APC                |               |             |
| AP Name (Source)      | Monitor AP              |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Monitor's APC           |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | C                       |               |             |
| Priority of Source AP | 0                       |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | of Msg. Source AP       |               |             |
| Continuation Flag     | 0                       |               |             |

DS 620142000  
1 November 1985

Message Type: Soft Shutdown

Type ID: SD

**Nature of Message:**

Message telling a specified AP to shut itself down. This message can only be sent to an AP that has the internal logic required to perform its own shutdown (as determined from the AP Characteristics Table). This message is sent as a result of receiving a Shutdown APC message.

Path: MPU - AP

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | N/A                |                    |
| Header Length         | 092                     |                    |                    |
| Data Length           | 0                       |                    |                    |
| Binary/Native Flag    | N (Default)             |                    |                    |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | SD                      |                    |                    |
| AP Name (Dest.)       | AP to be shutdown       |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | Local APC               |                    |                    |
| AP Name (Source)      | Local MPU               |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Local APC               |                    |                    |
| Serial #              | Filled in by Source MPU |                    |                    |
| Code                  | 0                       |                    |                    |
| Message Category      | C                       |                    |                    |
| Priority of Source AP | 0                       |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | of Msg. Source AP       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: Start Link

Type ID: SL

**Nature of Message:**

Message to a specified COMM AP telling it to establish the link between itself and its off-host sibling. The MPU will create an entry in the pair table to set a wait on the link status return.

Path: Monitor AP - COMM AP

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|-------------------------|--------------------|--------------------|
| Header Format         | A                       | N/A - the dest.    |                    |
| Header Length         | 092                     | COMM AP can        |                    |
| Data Length           | 0                       | only start         |                    |
| Binary/Native Flag    | N (Default)             | one link           |                    |
| Priority Flag         | 0                       |                    |                    |
| Message Type          | SL                      |                    |                    |
| AP Name (Dest.)       | COMM AP                 |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                    |                    |
| APC Name (Dest.)      | COMM APC                |                    |                    |
| AP Name (Source)      | Monitor AP              |                    |                    |
| Instance (Source)     | Det by SysGen Parameter |                    |                    |
| APC Name (Source)     | Monitor's APC           |                    |                    |
| Message Serial #      | Filled in by Source MPU |                    |                    |
| Processing Code       | 1                       |                    |                    |
| Message Category      | B                       |                    |                    |
| Priority of Source AP | From AP Char. Table     |                    |                    |
| Integrity Check Flag  | 0 (Default)             |                    |                    |
| Logging Flag          | 1                       |                    |                    |
| Stat. Collection Flag | 1                       |                    |                    |
| Test Flag             | 0 (Default)             |                    |                    |
| Delivery Trigger Flag | 0 (Default)             |                    |                    |
| Delivery Time Trigger | blank (Default)         |                    |                    |
| Delivery Trig. Cond.  | blank (Default)         |                    |                    |
| Original Source       | of Msg. Source AP       |                    |                    |
| Channel ID            | COMM AP's Channel       |                    |                    |
| Continuation Flag     | 0                       |                    |                    |

DS 620142000  
1 November 1985

Message Type: Start MPU

Type ID: SC

Nature of Message:

Command to startup (spawn) a given MPU.

Path: Monitor AP - Monitor's MPU

| Header Fields         | Header Values           | Data Fields  | Data Values                  |
|-----------------------|-------------------------|--------------|------------------------------|
| Header Format         | A                       | Process Name | PIC X(12)                    |
| Header Length         | 092                     |              | (of MPU to<br>be<br>started) |
| Data Length           | 0012                    |              |                              |
| Binary/Native Flag    | N (Default)             |              |                              |
| Priority Flag         | 1                       |              |                              |
| Message Type          | SC                      |              |                              |
| AP Name (Dest.)       | Monitor's MPU           |              |                              |
| Instance (Dest.)      | Det by SysGen Parameter |              |                              |
| APC Name (Dest.)      | Monitor's APC           |              |                              |
| AP Name (Source)      | Monitor AP              |              |                              |
| Instance (Source)     | Det by SysGen Parameter |              |                              |
| APC Name (Source)     | Monitor's APC           |              |                              |
| Message Serial #      | Filled in by Source MPU |              |                              |
| Processing Code       | 1                       |              |                              |
| Message Category      | C                       |              |                              |
| Priority of Source AP | 0                       |              |                              |
| Integrity Check Flag  | 0 (Default)             |              |                              |
| Logging Flag          | 1                       |              |                              |
| Stat. Collection Flag | 1                       |              |                              |
| Test Flag             | 0 (Default)             |              |                              |
| Delivery Trigger Flag | 0 (Default)             |              |                              |
| Delivery Time Trigger | blank (Default)         |              |                              |
| Delivery Trig. Cond.  | blank (Default)         |              |                              |
| Original Source       | of Msg. Source AP       |              |                              |
| Channel ID            | of Msg. Source AP       |              |                              |
| Continuation Flag     | 0                       |              |                              |

DS 620142000  
1 November 1985

Message Type: System State

Type ID: SS

**Nature of Message:**

Sent to an AP when the AP's "alive" status is known. This message serves to inform the AP of the current state of the IISS, along with certain characteristics of the AP.

Path: MPU      AP

| Header Fields         | Header Values           | Data Fields         | Data Values |
|-----------------------|-------------------------|---------------------|-------------|
| Header Format         | A                       | System State        | PIC X       |
| Header Length         | 092                     | Logical Channel     | PIC X(3)    |
| Data Length           | 0022                    | Original Source     | PIC X(15)   |
| Binary/Native Flag    | N (Default)             | MPU Instance        | PIC X(2)    |
| Priority Flag         | 0                       | Number of Mailboxes | PIC X       |
| Message Type          | SS                      |                     |             |
| AP Name (Dest.)       | "Alive" AP              |                     |             |
| Instance (Dest.)      | Det by SysGen Parameter |                     |             |
| APC Name (Dest.)      | Alive AP's APC          |                     |             |
| AP Name (Source)      | Local MPU               |                     |             |
| Instance (Source)     | Det by SysGen Parameter |                     |             |
| APC Name (Source)     | Local APC               |                     |             |
| Message Serial #      | Filled in by Source MPU |                     |             |
| Processing Code       | 1                       |                     |             |
| Message Category      | E                       |                     |             |
| Priority of Source AP | From AP Char. Table     |                     |             |
| Integrity Check Flag  | 0 (Default)             |                     |             |
| Logging Flag          | 1                       |                     |             |
| Stat. Collection Flag | 1                       |                     |             |
| Test Flag             | 0 (Default)             |                     |             |
| Delivery Trigger Flag | 0 (Default)             |                     |             |
| Delivery Time Trigger | blank (Default)         |                     |             |
| Delivery Trig. Cond.  | blank (Default)         |                     |             |
| Original Source       | of Msg. Source AP       |                     |             |
| Channel ID            | 000                     |                     |             |
| Continuation Flag     | 0                       |                     |             |



DS 620142000  
1 November 1985

Message Type: Table Data Request

Type ID: DR

**Nature of Message:**

Message to the CDM requesting a download of the static table data values. This is done when the MPU is told of a CDM configuration change. This message is hard coded as part of the MPU's startup file.

Path: MPU - CDMRP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | N/A         |             |
| Header Length         | 092                     |             |             |
| Data Length           | 0                       |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | DR                      |             |             |
| AP Name (Dest.)       | CDMRP                   |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | CDM's APC               |             |             |
| AP Name (Source)      | Requesting MPU          |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Requesting MPU's APC    |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 0                       |             |             |
| Message Category      | B                       |             |             |
| Priority of Source AP | 0                       |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | specified               |             |             |
| Continuation Flag     | 0                       |             |             |

DS 620142000  
1 November 1985

Message Type: Table Data Return

Type ID: DL

**Nature of Message:**

Indicates that the data following the header is to be used  
to update the MPU's local tables.

Path: CDMRP - MPU

| <u>Header Fields</u>  | <u>Header Values</u>    | <u>Data Fields</u>   | <u>Data Values</u> |
|-----------------------|-------------------------|----------------------|--------------------|
| Header Format         | A                       | Updated Static Up to |                    |
| Header Length         | 092                     | Table Data           | PIC X(1908)        |
| Data Length           | up to 1908              |                      |                    |
| Binary/Native Flag    | N (Default)             |                      |                    |
| Priority Flag         | 0                       |                      |                    |
| Message Type          | DL(Dest.)               |                      |                    |
| AP Name (Dest.)       | Requesting MPU          |                      |                    |
| Instance (Dest.)      | Det by SysGen Parameter |                      |                    |
| APC Name (Dest.)      | Requesting MPU's APC    |                      |                    |
| AP Name (Source)      | CDMRP                   |                      |                    |
| Instance (Source)     | Det by SysGen Parameter |                      |                    |
| APC Name (Source)     | CDM's APC               |                      |                    |
| Message Serial #      | Filled in by Source MPU |                      |                    |
| Processing Code       | From AP Int             |                      |                    |
| Message Category      | F                       |                      |                    |
| Priority of Source AP | 0                       |                      |                    |
| Integrity Check Flag  | 0 (Default)             |                      |                    |
| Logging Flag          | 1                       |                      |                    |
| Stat. Collection Flag | 1                       |                      |                    |
| Test Flag             | 0 (Default)             |                      |                    |
| Delivery Trigger Flag | 0 (Default)             |                      |                    |
| Delivery Time Trigger | blank (Default)         |                      |                    |
| Delivery Trig. Cond.  | blank (Default)         |                      |                    |
| Original Source       | from DR Msg             |                      |                    |
| Channel ID            | from DR Msg             |                      |                    |
| Continuation Flag     | as req'd                |                      |                    |

Message Type: Table Status Request\*

Type ID: TS

**Nature of Message:**

Request from an MPU at its startup for the configuration status of its tables. This message is hard coded as part of the MPU's startup file.

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | Status Code | PIC X(5)    |
| Header Length         | 092                     | Filler      | PIC X(12)   |
| Data Length           | 0017                    |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | TS                      |             |             |
| AP Name (Dest.)       | Monitor AP              |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Monitor's APC           |             |             |
| AP Name (Source)      | MPU                     |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Local APC               |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | E                       |             |             |
| Priority of Source AP | 0                       |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | MPU's Channel           |             |             |
| Continuation Flag     | 0                       |             |             |

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Message Type: Table Status Return

Type ID: ST

**Nature of Message:**

Current configuration status of the MPU's tables. Upon receipt of this message, the MPU will know whether it can build its tables completely from its existing files or if it has to request its static table data from the CDM.

Path: Monitor AP - MPU

| Header Fields         | Header Values           | Data Fields  | Data Values |
|-----------------------|-------------------------|--------------|-------------|
| Header Format         | A                       | Table Status | PIC X       |
| Header Length         | 092                     |              | 88 Local    |
| Data Length           | 0001                    |              | Tables      |
| Binary/Native Flag    | N (Default)             |              | O K         |
| Priority Flag         | O                       |              | 88 Get      |
| Message Type          | TR                      |              | Data        |
| AP Name (Dest.)       | Requesting MPU          |              | from        |
| Instance (Dest.)      | Det by SysGen Parameter |              | CDM         |
| APC Name (Dest.)      | Requesting MPU's APC    |              |             |
| AP Name (Source)      | Monitor AP              |              |             |
| Instance (Source)     | Det by SysGen Parameter |              |             |
| APC Name (Source)     | Monitor's APC           |              |             |
| Message Serial #      | Filled in by Source MPU |              |             |
| Processing Code       | 1                       |              |             |
| Message Category      | F                       |              |             |
| Priority of Source AP | O                       |              |             |
| Integrity Check Flag  | O (Default)             |              |             |
| Logging Flag          | 1                       |              |             |
| Stat. Collection Flag | 1                       |              |             |
| Test Flag             | O (Default)             |              |             |
| Delivery Trigger Flag | O (Default)             |              |             |
| Delivery Time Trigger | blank (Default)         |              |             |
| Delivery Trig. Cond.  | blank (Default)         |              |             |
| Original Source       | of Msg Source AP        |              |             |
| Channel ID            | MPU's Channel           |              |             |
| Continuation Flag     | O                       |              |             |

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Message Type: Tables Rebuilt

Type ID: RB

**Nature of Message:**

Sent to Monitor upon successful (or unsuccessful)  
completion of the task of rebuilding local tables using  
updated CDM data.

Path: MPU - Monitor

| Header Fields         | Header Values           | Data Fields  | Data Values |
|-----------------------|-------------------------|--------------|-------------|
| Header Format         | A                       | Table Status | PIC X       |
| Header Length         | 092                     |              | 88 Rebuilt  |
| Data Length           | 0001                    |              | 88 Unsuc-   |
| Binary/Native Flag    | N (Default - Native)    |              | cessful     |
| Priority Flag         | 0                       |              |             |
| Message Type          | RB                      |              |             |
| AP Name (Dest.)       | Monitor AP              |              |             |
| Instance (Dest.)      | Det by SysGen Parameter |              |             |
| APC Name (Dest.)      | Monitor's APC           |              |             |
| AP Name (Source)      | MPU                     |              |             |
| Instance (Source)     | Det by SysGen Parameter |              |             |
| APC Name (Source)     | Local APC               |              |             |
| Message Serial #      | Filled in by Source MPU |              |             |
| Processing Code       | 0                       |              |             |
| Message Category      | F                       |              |             |
| Priority of Source AP | 0 (Default)             |              |             |
| Integrity Check Flag  | 0 (Default - No)        |              |             |
| Logging Flag          | 1 (Yes)                 |              |             |
| Stat. Collection Flag | 1 (Yes)                 |              |             |
| Test Flag             | 0 (Default - No)        |              |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |              |             |
| Delivery Time Trigger | blank (Default)         |              |             |
| Delivery Trig. Cond.  | blank (Default)         |              |             |
| Original Source       | of Msg Source AP        |              |             |
| Channel ID            | MPU's Channel           |              |             |
| Continuation Flag     | 0                       |              |             |

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Message Type: Timeout Expired\*

Type ID: TE

**Nature of Message:**

Message informing an AP that the timeout on a paired message has expired before the response message arrived. This message can only be sent to AP's having the logic required to accept unsolicited messages (based on AP's On-Timeout characteristic).

Path: MPU - Local AP

| Header Fields         | Header Values              | Data Fields    | Data Values |
|-----------------------|----------------------------|----------------|-------------|
| Header Format         | A                          | Error Code     | PIC X(5)    |
| Header Length         | 092                        | Message Header | PIC X(92)   |
| Data Length           | 0097                       |                |             |
| Binary/Native Flag    | N (Default - Native)       |                |             |
| Priority Flag         | 0                          |                |             |
| Message Type          | TE                         |                |             |
| AP Name (Dest.)       | AP Requesting Pair         |                |             |
| Instance (Dest.)      | Assigned by MPU at AP Init |                |             |
| APC Name (Dest.)      | AP's APC                   |                |             |
| AP Name (Source)      | Local MPU                  |                |             |
| Instance (Source)     | Det by SysGen Parameter    |                |             |
| APC Name (Source)     | Local APC                  |                |             |
| Message Serial #      | Filled in by Source MPU    |                |             |
| Processing Code       | 1                          |                |             |
| Message Category      | E                          |                |             |
| Priority of Source AP | 0 (Default)                |                |             |
| Integrity Check Flag  | 0 (Default - No)           |                |             |
| Logging Flag          | 1 (Yes)                    |                |             |
| Stat. Collection Flag | 1 (Yes)                    |                |             |
| Test Flag             | 0 (Default - No)           |                |             |
| Delivery Trigger Flag | 0 (Default - Immed)        |                |             |
| Delivery Time Trigger | blank (Default)            |                |             |
| Delivery Trig. Cond.  | blank (Default)            |                |             |
| Original Source       | of Msg. Source AP          |                |             |
| Channel ID            | of Msg. Source AP          |                |             |
| Continuation Flag     | 0                          |                |             |

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Message Type: Unsolicited APC Termination\*

Type ID: CE

**Nature of Message:**

Message sent when an APC shuts down for internal reasons  
(other than on operator command).

Path: MPU - Monitor AP

| Header Fields         | Header Values           | Data Fields | Data Values |
|-----------------------|-------------------------|-------------|-------------|
| Header Format         | A                       | Error Code  | PIC X(5)    |
| Header Length         | 092                     | Filler      | PIC X(12)   |
| Data Length           | 0017                    |             |             |
| Binary/Native Flag    | N (Default)             |             |             |
| Priority Flag         | 0                       |             |             |
| Message Type          | CE                      |             |             |
| AP Name (Dest.)       | Monitor AP              |             |             |
| Instance (Dest.)      | Det by SysGen Parameter |             |             |
| APC Name (Dest.)      | Monitor's APC           |             |             |
| AP Name (Source)      | MPU of Terminating APC  |             |             |
| Instance (Source)     | Det by SysGen Parameter |             |             |
| APC Name (Source)     | Terminating APC         |             |             |
| Message Serial #      | Filled in by Source MPU |             |             |
| Processing Code       | 1                       |             |             |
| Message Category      | F                       |             |             |
| Priority of Source AP | From AP Char. Table     |             |             |
| Integrity Check Flag  | 0 (Default)             |             |             |
| Logging Flag          | 1                       |             |             |
| Stat. Collection Flag | 1                       |             |             |
| Test Flag             | 0 (Default)             |             |             |
| Delivery Trigger Flag | 0 (Default)             |             |             |
| Delivery Time Trigger | blank (Default)         |             |             |
| Delivery Trig. Cond.  | blank (Default)         |             |             |
| Original Source       | of Msg. Source AP       |             |             |
| Channel ID            | of Msg. Source AP       |             |             |
| Continuation Flag     | 0                       |             |             |

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Message Type: Unsolicited Initiation Accept      Type ID: IA

**Nature of Message:**

Acknowledgement that an AP was initiated upon receipt of an unsolicited message. Upon receipt of this ACK, the MPU will modify the entry in the Child Status Table to indicate a confirmed child AP.

Path: MPU - MPU

| Header Fields         | Header Values           | Data Fields          | Data Values |
|-----------------------|-------------------------|----------------------|-------------|
| Header Format         | A                       |                      |             |
| Header Length         | 092                     |                      |             |
| Data Length           | 0025                    |                      |             |
| Binary/Native Flag    | N (Default)             | Process Name (of PIC |             |
| Priority Flag         | 0                       | Init Msg             | X(12)       |
| Message Type          | IA                      | Source AP            |             |
| AP Name (Dest.)       | Init Msg Source MPU     |                      |             |
| Instance (Dest.)      | Det by SysGen Parameter |                      |             |
| APC Name (Dest.)      | Source APC              | AP Name (of AP       | PIC X(10)   |
| AP Name (Source)      | Init AP's MPU           | Init by Unsol.       |             |
| Instance (Source)     | Det by SysGen           | Msg)                 |             |
|                       | Parameter               |                      |             |
| APC Name (Source)     | Init AP's APC           |                      |             |
| Message Serial #      | Filled in by            |                      |             |
|                       | Source MPU              |                      |             |
| Processing Code       | 1                       | Channel ID           | PIC X(3)    |
| Message Category      | G                       | (Child Init.         |             |
| Priority of Source AP | From AP Char.           | Under from           |             |
|                       | Table                   | Init Msg)            |             |
| Integrity Check Flag  | 0 (Default)             |                      |             |
| Logging Flag          | 1                       |                      |             |
| Stat. Collection Flag | 1                       |                      |             |
| Test Flag             | 0 (Default)             |                      |             |
| Delivery Trigger Flag | 0 (Default)             |                      |             |
| Delivery Time Trigger | blank (Default)         |                      |             |
| Delivery Trig. Cond.  | blank (Default)         |                      |             |
| Original Source       | of Msg. Source AP       |                      |             |
| Channel ID            | of Msg. Source AP       |                      |             |
| Continuation Flag     | 0                       |                      |             |



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Message Type: Unstable Table

Type ID: UT

**Nature of Message:**

Sent on the occurrence of an entry-not-found in the NTM Tables where the error occurs due to a problem within the NTM as opposed to bad input. The message carries information that pinpoints the error for the operator. In most cases, this message should result in the Operator shutting down the NTM.

Path: MPU      AP

| <u>Header Fields</u>  | <u>Header Values</u>     | <u>Data Fields</u> | <u>Data Values</u> |
|-----------------------|--------------------------|--------------------|--------------------|
| Header Format         | A                        | Table Name         | PIC X(3)           |
| Header Length         | 092                      | Module Name        | PIC X(6)           |
| Data Length           | 0044                     | Error Field        | PIC X(10)          |
| Binary/Native Flag    | N (Default)              | Error Value        | PIC X(20)          |
| Priority Flag         | 0                        | Error Return       | PIC X(5)           |
| Message Type          | UT                       |                    |                    |
| AP Name (Dest.)       | VAX Monitor              |                    |                    |
| Instance (Dest.)      | Det by SysGen Parameter  |                    |                    |
| APC Name (Dest.)      | Monitor's APC            |                    |                    |
| AP Name (Source)      | MPU where error occurred |                    |                    |
| Instance (Source)     | Det by SysGen Parameter  |                    |                    |
| APC Name (Source)     | Local APC                |                    |                    |
| Message Serial #      | Filled in by Source MPU  |                    |                    |
| Processing Code       | 1                        |                    |                    |
| Message Category      | E                        |                    |                    |
| Priority of Source AP | From AP Char. Table      |                    |                    |
| Integrity Check Flag  | 0 (Default)              |                    |                    |
| Logging Flag          | 1                        |                    |                    |
| Stat. Collection Flag | 1                        |                    |                    |
| Test Flag             | 0 (Default)              |                    |                    |
| Delivery Trigger Flag | 0 (Default)              |                    |                    |
| Delivery Time Trigger | blank (Default)          |                    |                    |
| Delivery Trig. Cond.  | blank (Default)          |                    |                    |
| Original Source       | of Msg. Source AP        |                    |                    |
| Channel ID            | 000                      |                    |                    |
| Continuation Flag     | 0                        |                    |                    |

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Message Type: Unsuccessful Initiation

Type ID: NI

**Nature of Message:**

Sent to the MPU of the source AP of a specific initiation message when the requested initiation is not successful. Upon receipt, the source (or Parent) MPU will delete the relevant child table entry.

Path: Child MPU - Parent MPU

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | AP Name (from | PIC X(10)   |
| Header Length         | 092                     | Init Msg)     |             |
| Data Length           | 0022                    | Parent AP     | PIC X(12)   |
| Binary/Native Flag    | N (Default - Native)    | Process Name  |             |
| Priority Flag         | 0                       |               |             |
| Message Type          | NI                      |               |             |
| AP Name (Dest.)       | Source MPU of Init Msg  |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | Source MPU's APC        |               |             |
| AP Name (Source)      | Dest MPU of Init Msg    |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Dest MPU's APC          |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | E                       |               |             |
| Priority of Source AP | 0 (Default)             |               |             |
| Integrity Check Flag  | 0 (Default - No)        |               |             |
| Logging Flag          | 1 (Yes)                 |               |             |
| Stat. Collection Flag | 1 (Yes)                 |               |             |
| Test Flag             | 0 (Default - No)        |               |             |
| Delivery Trigger Flag | 0 (Default - Immed)     |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | from Init Msg           |               |             |
| Channel ID            | from Init Msg           |               |             |
| Continuation Flag     | 0                       |               |             |

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Message Type: Update APC Table

Type ID: UA

**Nature of Message:**

Message informing an off-host Monitor AP of APC Status table updates.

Path: Monitor AP - Monitor AP

| Header Fields         | Header Values           | Data Fields         | Data Values |
|-----------------------|-------------------------|---------------------|-------------|
| Header Format         | A                       | Status Update PIC X |             |
| Header Length         | 092                     |                     |             |
| Data Length           | 0001                    |                     |             |
| Binary/Native Flag    | N (Default)             |                     |             |
| Priority Flag         | 0                       |                     |             |
| Message Type          | UA                      |                     |             |
| AP Name (Dest.)       | Off-Host Monitor AP     |                     |             |
| Instance (Dest.)      | Det by SysGen Parameter |                     |             |
| APC Name (Dest.)      | Off-Host Monitor's APC  |                     |             |
| AP Name (Source)      | VAX Monitor AP          |                     |             |
| Instance (Source)     | Det by SysGen Parameter |                     |             |
| APC Name (Source)     | VAX Monitor's APC       |                     |             |
| Message Serial #      | Filled in by Source MPU |                     |             |
| Processing Code       | 1                       |                     |             |
| Message Category      | E                       |                     |             |
| Priority of Source AP | From AP Char. Table     |                     |             |
| Integrity Check Flag  | 0                       |                     |             |
| Logging Flag          | 1                       |                     |             |
| Stat. Collection Flag | 1                       |                     |             |
| Test Flag             | 0 (Default              |                     |             |
| Delivery Trigger Flag | 0 (Default              |                     |             |
| Delivery Time Trigger | blank (Default)         |                     |             |
| Delivery Trig. Cond.  | blank (Default)         |                     |             |
| Original Source       | of Msg. Source AP       |                     |             |
| Channel ID            | of Msg. Source AP       |                     |             |
| Continuation Flag     | 0                       |                     |             |

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Message Type: Update Host Table

Type ID: UH

Nature of Message:

Message informing an off-host Monitor AP of Host table updates.

Path: Monitor AP - Monitor AP

| Header Fields         | Header Values           | Data Fields   | Data Values |
|-----------------------|-------------------------|---------------|-------------|
| Header Format         | A                       | Host Name     | PIC X(3)    |
| Header Length         | 092                     | Status Update | PIC X       |
| Data Length           | 0004                    |               |             |
| Binary/Native Flag    | N (Default)             |               |             |
| Priority Flag         | 0                       |               |             |
| Message Type          | UA                      |               |             |
| AP Name (Dest.)       | Off-Host Monitor AP     |               |             |
| Instance (Dest.)      | Det by SysGen Parameter |               |             |
| APC Name (Dest.)      | Off-Host Monitor's APC  |               |             |
| AP Name (Source)      | Local Monitor AP        |               |             |
| Instance (Source)     | Det by SysGen Parameter |               |             |
| APC Name (Source)     | Local Monitor APC       |               |             |
| Message Serial #      | Filled in by Source MPU |               |             |
| Processing Code       | 1                       |               |             |
| Message Category      | E                       |               |             |
| Priority of Source AP | From AP Char. Table     |               |             |
| Integrity Check Flag  | 0 (Default)             |               |             |
| Logging Flag          | 1                       |               |             |
| Stat. Collection Flag | 1                       |               |             |
| Test Flag             | 0 (Default)             |               |             |
| Delivery Trigger Flag | 0 (Default)             |               |             |
| Delivery Time Trigger | blank (Default)         |               |             |
| Delivery Trig. Cond.  | blank (Default)         |               |             |
| Original Source       | of Msg. Source AP       |               |             |
| Channel ID            | of Msg. Source AP       |               |             |

## E.2 Eation Flag

### E.2.1 Error Message Handling

When an error occurs within (or is detected by) the MPU, an error message is sent to either the Monitor AP, the source AP (where the error is related to a message), or both. However, sending an error message in the normal fashion (by writing to the MPU's own mailbox and performing all the message management functions) could easily result in an infinite loop. To avoid this, the MPU will have an error message formatting routine that formats and effects the send of the error messages to either Monitor AP, the Source AP, or both. In the event that the Monitor AP's mailbox is inaccessible, the fatal error processing routine (ERRPRO) will be called. The MPU's error formatting routine will have access to two "canned" headers and will be accessed by two MPU routines described below.

1.       CALL "SNDMON" USING:     Error-Code  
                                  Name-String  
                                  Processing-Code

Description:     SNDMON will provide the error message formatting routine with the data needed to complete a "canned" header (in this case, one where the destination is the on-host Monitor AP). The formatting routine will move the data values to their proper fields and send the message. This call handles messages of Type 31, 32 and 33. (See Appendix E for formats).

Inputs:           Error Code  
                  Name-String  
                  Processing-Code

2.       CALL "SNDSAP" USING:     Error-Code  
                                  Entire Offending Message  
                                  Header

Description:     SNDSAP will provide the error message formatting routine with the data needed to complete a "canned" header (in this case, one where the destination is the source AP of the offending message). The formatting

routine will move the data values to their proper fields and send the message. This call handles messages of type 32, 33, and 34. (See Appendix E for formats).

### E.2.2 Error Message Description

Table E-3 lists the errors identified for the NTM. Each error is described along with the values for their calls to the error message

**TABLE E-3**  
**ERROR MESSAGES DESCRIPTIONS**

| <u>Error Description</u>   | <u>Error Code</u> | <u>Parameters</u>                                                               |
|----------------------------|-------------------|---------------------------------------------------------------------------------|
| Can't write to Mailbox     | 31001             | Data Length = 17<br>Name-String = Mailbox Name<br>Processing-Code = IPC Code    |
| Can't Create Mailbox       | 31002             | Data Length = 17<br>Name-String = Mailbox Name<br>Processing-Code = IPC Code    |
| Can't Read Mailbox         | 31003             | Data-Length = 17<br>Name-String = Mailbox Name<br>Processing-Code = IPC Code    |
| Mailbox Disconnect Error   | 31004             | Data-Length = 17<br>Name-String = Mailbox Name<br>Processing-Code = IPC Code    |
| Call Wait Error            | 31005             | Data-Length = 17<br>Name-String = NTM Module Name<br>or AP Name if API error    |
| Processing-Code = IPC Code |                   |                                                                                 |
| Set Time Error             | 31006             | Data-Length = 17<br>Name-String = NTM Module Name<br>Processing-Code = IPC Code |
| Mapping Error              | 31007             | Data-Length = 17                                                                |

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|                                  |       |                                                                                                           |
|----------------------------------|-------|-----------------------------------------------------------------------------------------------------------|
|                                  |       | Name-String = NTM Module Name<br>or AP Name if<br>API error                                               |
|                                  |       | Processing-Code = OS Code                                                                                 |
| Job Process<br>Information Error | 31008 | Data-Length = 17<br>Name-String = NTM Module Name<br>or AP Name if API error<br>Processing-Code = OS Code |
| Process Start Error              | 31009 | Data-Length = 17<br>Name-String = Process Name<br>Processing-Code = OS Code                               |

TABLE E-3

ERROR MESSAGES DESCRIPTIONS (Continued)

| <u>Error Description</u>        | <u>Error Code</u> | <u>Parameters</u>                                                           |
|---------------------------------|-------------------|-----------------------------------------------------------------------------|
| Process Abort Error             | 31010             | Data-Length = 17<br>Name-String = Process Name<br>Processing-Code = OS Code |
| Process Not Found               | 31011             | Data Length = 17<br>Name-String = Process Name<br>Processing-Code = OS Code |
| File Read Error                 | 31012             | Data Length = 17<br>Name-String = File Name<br>Processing-Code = OS Code    |
| File Write Error                | 31013             | Data-Length = 17<br>Name-String = File Name<br>Processing-Code = OS Code    |
| File Close Error                | 31014             | Data-Length = 17<br>Name-String = File Name<br>Processing-Code = OS Code    |
| File Open Error                 | 31015             | Data-Length = 17<br>Name-String = File Name<br>Processing-Code = OS Code    |
| Table Read Error                | 31016             | Data-Length = 17<br>Name-String = Table Name<br>Processing-Code = OS Code   |
| Table Write Error               | 31017             | Data-Length = 17<br>Name-String = Table Name<br>Processing-Code = OS Code   |
| CDM Data Access Errors          | 31018             | Data-Length = 17<br>Name-String = MPU Name<br>Processing-Code = Blank       |
| Message Arrived at<br>Wrong APC | 31019             | Data-Length = 17<br>Name-String = Sending MPU<br>Processing-Code = Blank    |



TABLE E-3

**ERROR MESSAGES DESCRIPTIONS (Continued)**

| <u>Error Description</u>                                    | <u>Error Code</u> | <u>Parameters</u>                                                                                         |
|-------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------|
| OS Call Error<br>(for those not<br>or covered specifically) | 31020             | Data-Length = 17<br>Name-String = MPU Module Name<br>AP Name if AP Interface<br>Processing-Code = OS Code |
| Time-out Error                                              | 31021             | Data-Length = 17<br>Name-String =<br>Processing-Code                                                      |
| COBOL Call Error                                            | 31022             | Data-Length = 17<br>Name-String = Offending AP<br>Processing-Code                                         |
| Exception Condition                                         | 31023             | Data-Length = 17<br>Name-String = AP Having<br>Exception Condition<br>Processing Code                     |
| Entry-Not-Found                                             | 31024             | Data-Length = 17<br>Name-String = Table Name<br>Processing-Code = Blanks                                  |
| Entry-Not-Deleted                                           | 31025             | Data-Length = 17<br>Name-String = Table Name<br>Processing-Code = Blanks                                  |
| Invalid Search Field                                        | 31026             | Data-Length = 17<br>Name-String = Table Name<br>Processing-Code = Blanks                                  |
| Cancel Timeout Error                                        | 31027             | Data-Length = 17<br>Name-String=<br>Processing Code =                                                     |
| IPC Error                                                   | 31028             | Data-Length = 17<br>Name-String = Error Entity<br>Processing-Code = IPC Code                              |

TABLE E-3

ERROR MESSAGES DESCRIPTIONS (Continued)

| <u>Error Description</u>           | <u>Error Code</u> | <u>Parameters</u>                                                                                                                       |
|------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Invalid Category in Message Header | 32001             | On CALL "SNDMON"<br>Data Length = 17<br>Name-String = Process Name<br>Processing-Code = OS Code<br>On CALL "SNDSAP"<br>Offending Header |
| Invalid Header Format              | 32002             | On CALL "SNDMON"<br>Data Length = 17<br>Name-String = Source AP<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header      |
| Invalid Header Length              | 32003             | On CALL "SNDMON"<br>Data-Length = 17<br>Name-String = Source AP<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header      |
| Invalid Binary/Native              | 32004             | On CALL "SNDMON" Flag<br>Data-Length = 1<br>Name-String = Source AP<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header  |
| Invalid Message Type               | 32005             | On CALL "SNDMON"<br>Data-Length = 17<br>Name-String = Source AP<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header      |

TABLE E-3

**ERROR MESSAGES DESCRIPTIONS (Continued)**

| <u>Error Description</u>         | <u>Error Code</u> | <u>Parameters</u>                                                                                                                       |
|----------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Invalid Source AP                | 32006             | On CALL "SNDMON"<br>Data-Length = 0<br>Name-String = Blank<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>N/A                        |
| Invalid Source Instance          | 32007             | On CALL "SNDMON"<br>Data Length = 17<br>Name-String = Source AP<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>N/A                   |
| Invalid Source APC Name          | 32008             | On CALL "SNDMON"<br>Data Length = 17<br>Name-String = Source AP Name<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header |
| Invalid (Header) Processing Code | 32009             | On CALL "SNDMON"<br>Data-Length = 17<br>Name-String = Source<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header         |
| Invalid Continuation Flag        | 32010             | On CALL "SNDMON"<br>Data-Length = 1<br>Name-String = Source AP<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Offending Header       |
| Invalid Data Length              | 32011             | On CALL "SNDMON"<br>Data-Length = 17<br>Name-String = Source AP                                                                         |

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Processing-Code - Blank  
On CALL "SNDSAP"  
Offending Header

TABLE E-3

ERROR MESSAGES DESCRIPTIONS (Continued)

| <u>Error Description</u>                   | <u>Error Code</u> | <u>Parameters</u>                                                                                                                  |
|--------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Invalid Message Priority                   | 32012             | On CALL "SNDMON"<br>Data-Length = 17<br>Name String = Source AP<br>Processing Code = Blank<br>On CALL "SNDSAP"<br>Offending Header |
| Resource Unavailable<br>-or-<br>Table Full | 33001             | On CALL "SNDMON"<br>Data-Length = 17<br>Name-String = Table Name<br>Processing-Code = Blank<br>On CALL "SNDSAP"<br>Entire Header   |
| No Authorization                           | 34001             | Entire Header                                                                                                                      |
| Illegal Message Type                       | 34002             | Entire Header                                                                                                                      |
| Invalid Destination                        | 34003             | Entire Header                                                                                                                      |

END

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