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AUTOMATED INTELLIGENCE PROCESSES EXERCISE AND REVIEW SYSTEM (AI--ETC(U)

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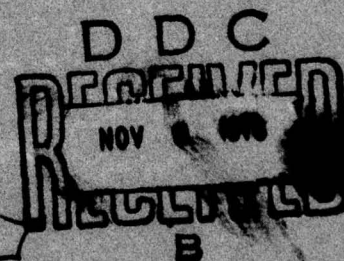
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**AUTOMATED INTELLIGENCE PROCESSES EXERCISE
AND REVIEW SYSTEM (AIPERS)**

INCO, INC.

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AIR FORCE SYSTEMS COMMAND
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This final technical report provides; (1) functional descriptions of and specifications for scenario generation with automated assists and scenario processing, (2) notes on methodologies for integrating decision impact analysis with exercise control, and (3) a user's guide for the AIPERS Demonstration Utility Prototype.		

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SUMMARY

I. THE TECHNICAL PROBLEM

In pursuing the research and development strategies which were developed in previous INCO, INC. contractual efforts regarding the evolution of an Automated Intelligence Processes Exercise and Review System (AIPERS), the several technical milestones to be reached have been factored and initially addressed. Previously, exercise control and tracking functions were provided with functional specifications, the matter of post-exercise critiques was treated in detail and some initial considerations were structured with respect to the incorporation of decision impact analysis in the control function for automated exercise systems. As a result of those past efforts, specific areas requiring further research and development were identified; work accomplished on the present contract has addressed those R&D areas. The technical problem has consisted of performing the necessary analytical and design effort to complete the functional specifications for all AIPERS modules, investigate more thoroughly the role of decision impact analysis, and the development of the means to demonstrate the exercise system's designed features in a Demonstration Utility Prototype.

II. GENERAL METHODOLOGY

In researching solutions to the several technical problems attendant to the development of automated exercise systems, the methodology employed was essentially an iteration of that for the previous contract effort. Each contributor was encouraged to independently "brain-storm" the possible paths of development. Subsequently, in shirt-sleeve seminars, the members of the development team discussed their various options, and from such presentations, compatible design approaches were selected. The design characteristics of each module or task performance feature were thereby settled upon. As an example: the scenario's key events were first identified and the necessary messages were written and sequenced. Following this the two additional design selections were performed for scenario generation using a message library and for scenario processing. After the development of anticipated response arrays for key events was completed, enhancement of the scenario processor was possible to accommodate the arrays so that they could be viewed by the Control Team. Because the arrays comprised various queries, responses to anticipated queries were written and control capabilities were created to activate such responses.

In many instances, such joint development procedures resulted in interim solutions which required refinement. As each performance characteristic was settled upon, relevant data were formalized in technical memoranda. Later, the memoranda formed the nucleus for the contents of the Final Technical Report.

III. THE TECHNICAL REPORT

The results of the R&D effort during the course of the present contract as documented in the Final Technical Report are included in four discrete discussions. The first two address the remaining logic modules of the exercise system which require functional design specifications: Scenario Generation with Automated Assists, and Scenario Processing. These two sections supplement similar sections of the previous Final Technical Report which covered Exercise Controls and Exercise Tracking.

A third chapter in the report discusses some methods of incorporating the results of decision impact analysis (i.e., the assessment of the effects of human decision upon desired exercise vectors) into exercise controls. Two specific methods, sum of actions taken and weighted responses, are used in conjunction with a number of scenario elements and anticipated arrays of an analyst's responses. Such techniques are to be tested using the AIPERS Demonstration Utility Prototype (DUP).

The final chapter of the report consists of a User's Manual for the DUP. The manual contains the necessary instructions for use of the DUP in a PDP 11/45, AN/GYQ-21(V) environment.

At this time, all four modules, as well as ancillary performance units, are ready for system design specification, coding and testing for application to a PDP 11/45 environment. The sequence of total exercise system development as presently envisaged is as shown on Figure 1. Work to date as discussed in the Technical Report is within the dotted lines.

IV. IMPLICATIONS FOR FURTHER RESEARCH

The core areas for further research attendant to full-scale automated exercise development or generation comprises empirical testing of the methods for utilizing decision impact analysis, response arrays and the complete integration of the two to enhance exercise control problems. Such research efforts should be conducted with a scenario expanded from that presently available to enable the testing of a full spectrum of possible decision analysis impacts. Other research which is desirable is focused upon the development of flexible, highly responsive and rapid scenario generation capabilities. None of the software programs essential to these capabilities has as yet been written. The efficient functioning of these two exercise performance features are essential to effective exercise production.

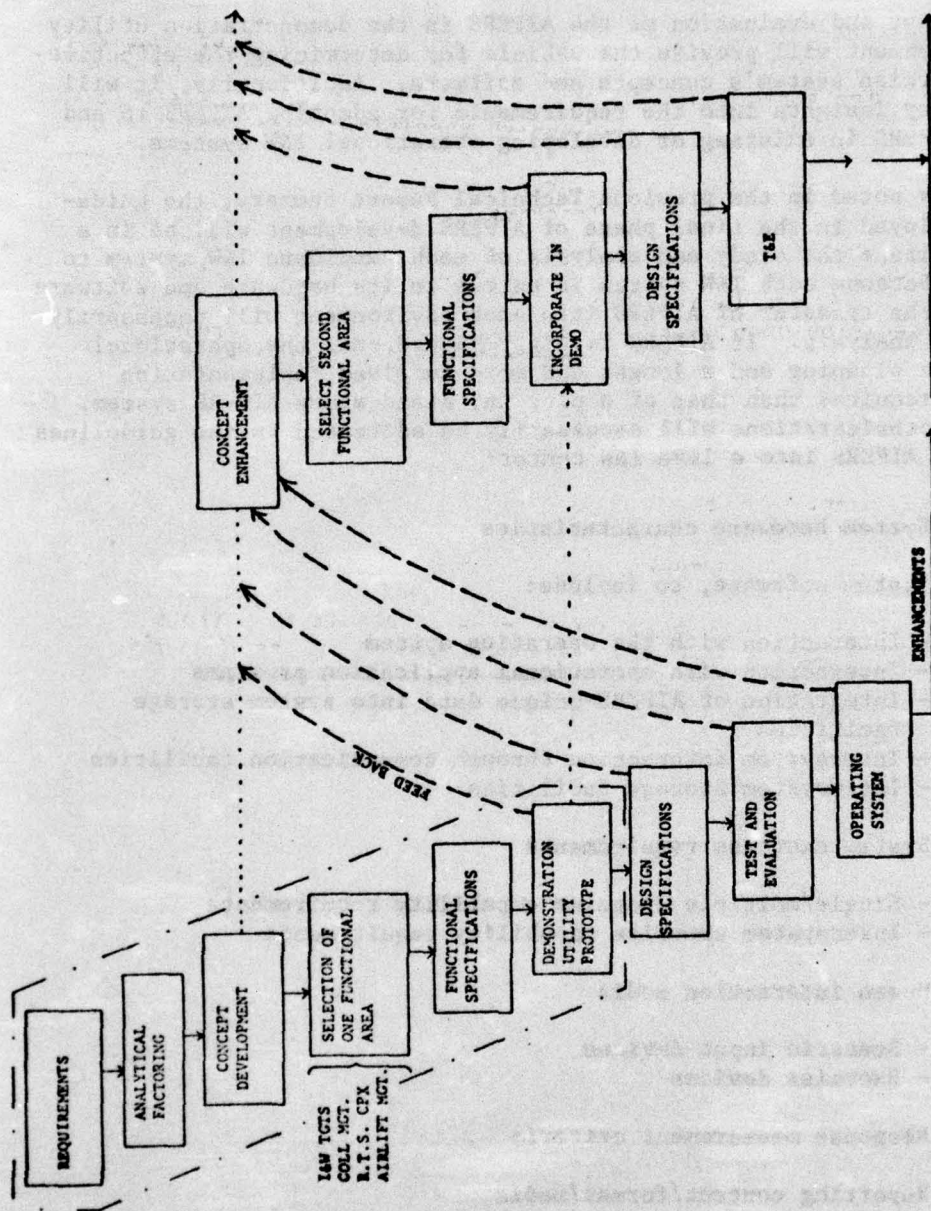


Figure 1. Sequence of AIPERS Development Tasks

V. SPECIAL COMMENTS

The test and evaluation of the AIPERS in the demonstration utility prototype environment will provide the vehicle for determining the effectiveness of the exercise system's concepts and software. Additionally, it will provide necessary insights into the requirements for adapting AIPERS to and implementing AIPERS in existing or developing operational I&W systems.

As was noted in the previous Technical Report Summary, the guidelines to be employed in the final phase of AIPERS development will be in a format to facilitate the study and analysis of each candidate I&W system to be exercised. Because each I&W system is unique in its hardware and software configuration, the transfer of AIPERS into each environment will necessarily require careful analysis. If AIPERS is piggy-backed onto the operational I&W system, more planning and a longer and more involved implementation effort will be required than that of a plug-in, stand-alone AIPERS system. These types of considerations will necessarily be addressed in the guidelines for integrating AIPERS into a live I&W center:

- o System hardware characteristics
- o System software, to include:
 - Interaction with the operating system
 - Interaction with operational application programs
 - Integration of AIPERS-unique data into system storage facilities
 - Intersystem interaction through communication facilities
 - Intersystem storage facilities
- o System exercise requirements
 - Single/multiple exercise capability requirements
 - Intersystem exercise capability requirements
- o Human interaction media
 - Scenario input devices
 - Exercise devices
- o Response measurement criteria
- o Reporting content/format/media
- o Scenario development
- o Training scenario

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EVALUATION

This is the third in a series of technical reports addressed to the development of aids to facilitate exercise and review of automated intelligence systems.

A Demonstration Utility Prototype (DUP) is currently operational within which will process a scenario of up to 100 events so one in two analysts may interact with 8 resources required to appropriately respond to the scenario stimulation in a simulated I & W center. Chapter V is the users manual.

The effort is of value to exercise the many intelligence centers currently being given automated aids and netted together, enabling realistic assessment of capabilities. At present all exercises are developed manually and are consequently extremely cumbersome and expensive. It also shows promise as a training aid.

Patricia M. Langendorf
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Project Engineer

CHAPTER I

INTRODUCTION AND SUMMARY

A. BACKGROUND

This volume is the third in a series of technical reports prepared by INCO, INC., which define, describe, and submit interim design specifications by function for the components of the Automated Intelligence Processes Exercise and Review System (AIPERS). The initial document in the series was titled, "Intelligence Exercise Generation Concept", 1 April 1974. The second document was titled, "Exercise Generation Concept Improvement: Technical Definitions and a Development Plan for an Automated Exercise System," 30 June 1975, and was subsequently published as RADC-TR-75-252. With this previous documentation, the feasibility of developing an automated exercise system was established and a generalized operational concept for AIPERS was produced. To place the current effort in context of past endeavors, a concise review of the latter follows. In the two Final Technical Reports, INCO, INC.:

- o Detailed the indications and warning intelligence processes, products and interfaces with other functional areas and informational resources.
- o Presented the objectives of exercises and exercise systems derived from official documentation.
- o Developed methodologies for exercising the intelligence processes on a non-interference basis.
- o Evolved evaluation criteria for an automated exercise generation system which were in concert with the defined objectives of exercises and exercise systems.
- o Identified the body of state-of-the-art technology which is applicable to the design and structuring of the AIPERS.
- o Highlighted the critical areas of design work for research and development.
- o Prepared a detailed development plan and an implementation schedule for the exercise system.
- o Provided functional design specifications for exercise control and tracking functions and the methodology for performing tracking.
- o Articulated initial concepts for employing decision impact analysis regarding the assessment of scenario event stimulated human responses.

- o Accomplished an analysis of and evolved procedures for exercise operations and management functions.

Against this background of aggressive research and development accomplishments, work on the current contractual effort was planned to supplement the previous ones and to arrive at a point where the exercise system was fully described and where a prototype of the system would be demonstrable.

B. THE CURRENT EFFORT

The contents of this volume address the results of the contractual effort between 11 June 1975 and 10 June 1976. During that period, the remaining functional modules of the exercise system were provided descriptions and specifications. Included were the Scenario Generator which functions in the pre-exercise environment with automated assists and the Scenario Processor which provides for scenario element release and for the interface capabilities between the various modules. Additional work was conducted toward the technical definition and incorporation of decision analysis into the exercise control function. Further, a Demonstration Utility Prototype (DUP) of AIPERS was developed which has a number of the full scale exercise system's attributes. The DUP will process a scenario of up to 100 events so that one or two analysts may interact with eight resources required to appropriately respond to the scenario stimulations in a simulated I&W center. Automated exercise controls are provided which enable a "Control Team" at a separate CRT terminal to interrupt the exercise, accelerate the release of the scenario, inject ad hoc messages into the Scenario Processor, change event time tags and simulate other addressees of the analyst/player. Also an Exercise Tracker is provided which will log all messages processed, all Control Team actions and analyst's responses. Tracker print outs will enhance post-exercise critique procedures greatly. A schema of the DUP is presented at Figure I-1 which illustrates the interfaces designed into it. Figure I-2 is a schema of the actual automated exercise system. Similarities and differences of the two may be examined from comparisons of the schematics.

C. SPECIFIC ACCOMPLISHMENTS

With the publication of this document, the several modules of AIPERS have been readied for system design specification, coding and testing.

1. Scenario Generation with Automated Assists

Scenario Generator techniques have been identified and described in detail. The AIPERS Scenario Generator will take advantage of a Message Library of pre-stored, expandable event descriptions or messages which may be retrieved for review at a CRT, edited if desired and reassigned to the scenario being compiled. The detailed functional specifications for this module of AIPERS are provided in Chapter II of this document.

2. Scenario Processor

Scenario Processor performance characteristics and interfaces have been defined and specified. The Scenario Processor acts as a master regulator of exercise activities and provides the medium whereby the Control element may intercede into exercise progression. This module calls up event descriptors or messages according to their pre-set time tags and sends them to the analyst's CRT for review. Ad hoc inputs to the exercise by the Control Team are also admitted by the Scenario Processor. Chapter III of this document includes the detailed functional specifications for the module.

3. Decision Impact Analysis

The role of decision impact analysis in the functions of an exercise was investigated intensively. Using some of the concepts developed in a previous INCO, INC. Technical Report, quantification techniques were explored. The objective of quantification was to generate an error signal to the Control Team whenever the exercise's progression become skewed from the desired goals. Introducing decision impact analysis into the Demonstration Utility Prototype during scenario processing will enable the proving out of the various findings to date. Chapter IV of this document comprises technical discussions of approaches and findings relating to decision impact analysis.

4. Demonstration Utility Prototype of AIPERS

The final Chapter of this document consists of a User's Manual for the prototype. The manual is a revised and refined version of that originally provided RADC under CDRL item A003. Following the instructions and routines prescribed in the manual will enable those with only rudimentary understanding of hardware/software functioning to perform or operate the DUP for a running scenario on the PDP-11/45.

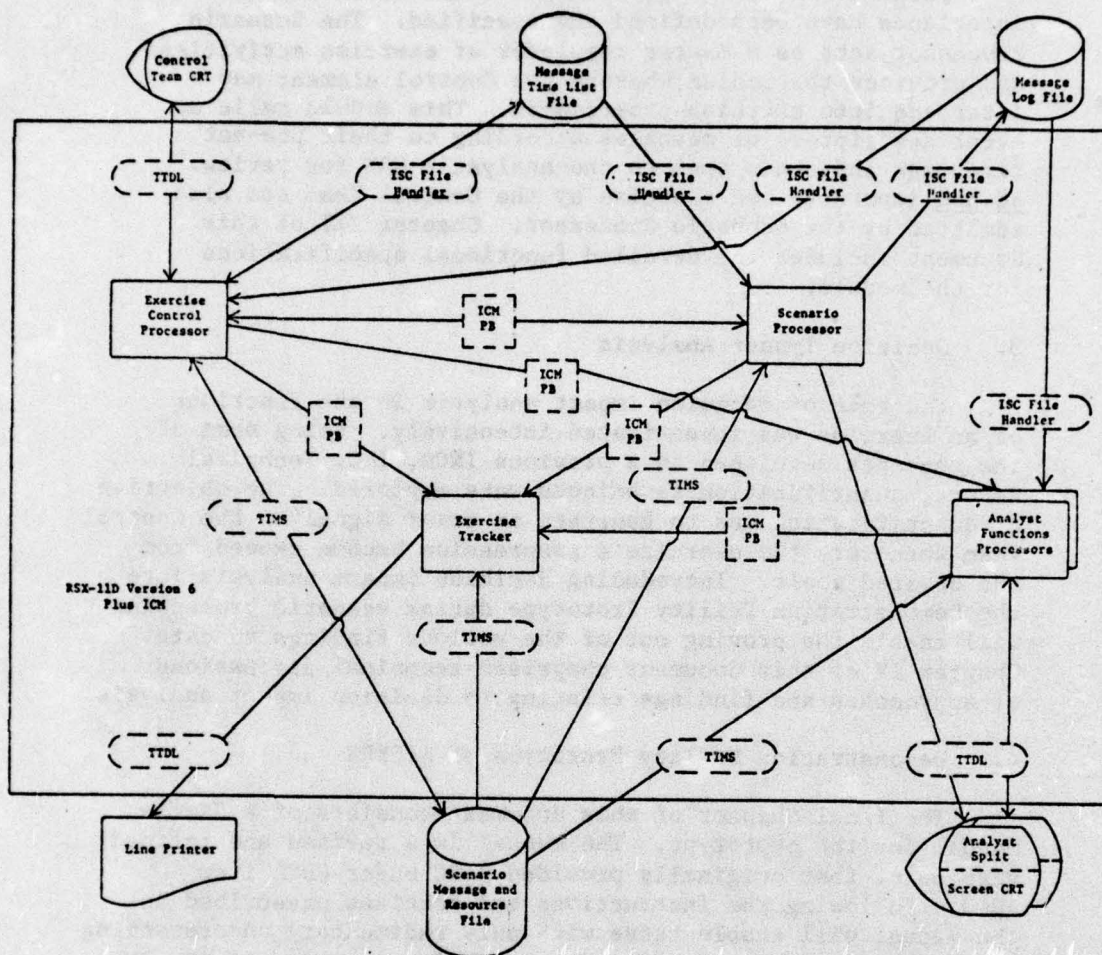


Figure I-1. Schema for the Demonstration Utility Prototype of AIPERS

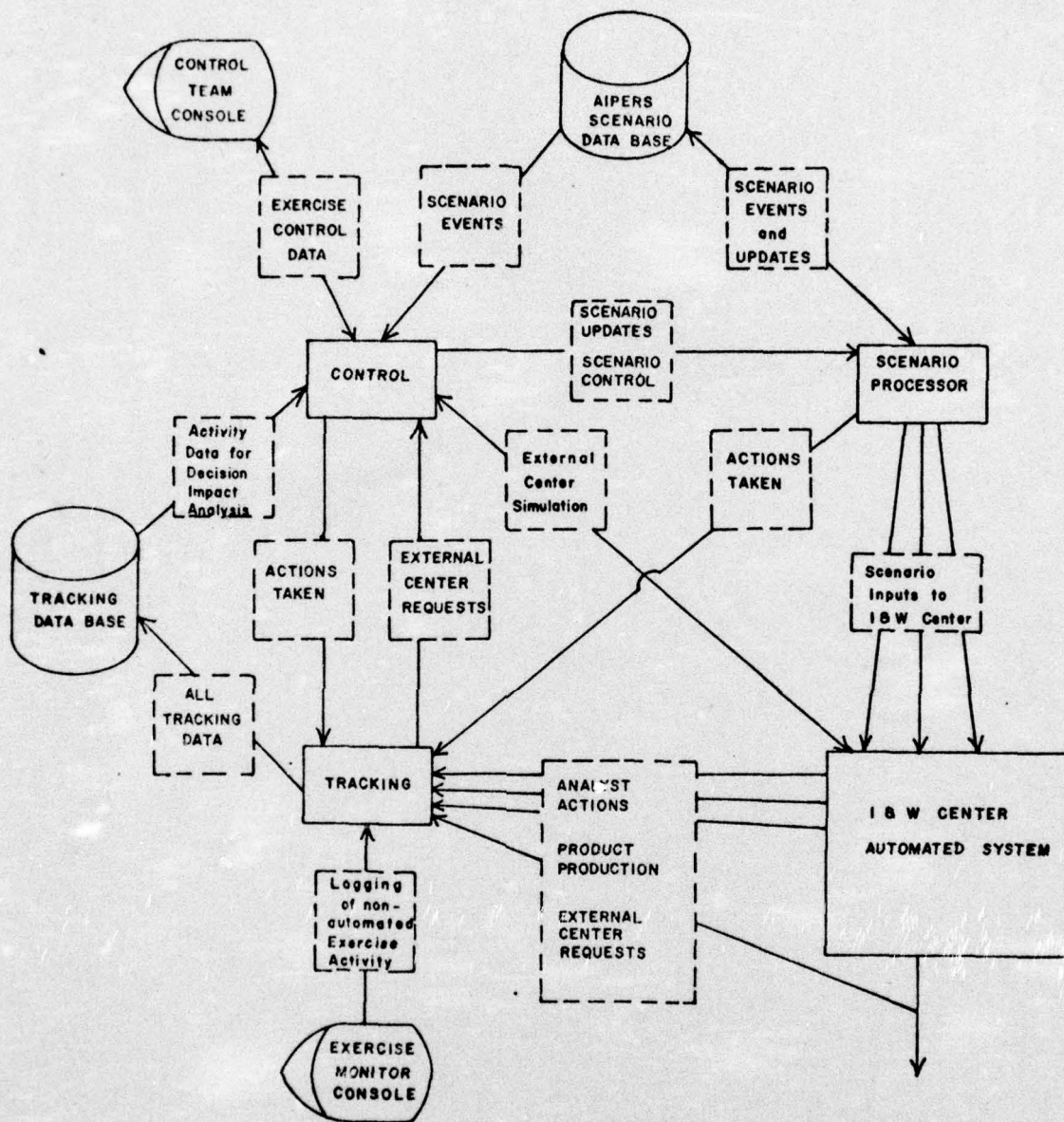


Figure I-2. Schema for the Automated Intelligence Processes Exercise and Review System

CHAPTER II

FUNCTIONAL SPECIFICATIONS

FOR SCENARIO GENERATION WITH AUTOMATED ASSISTS

A. INTRODUCTION

Scenario generation procedures presently employed within the DoD intelligence community are laborious and time consuming. Each scenario for an exercise is generally prepared from the very beginning, and is prepared entirely by hand. Also, once a scenario is produced, it is only with the greatest difficulty that it may be altered to be used in a varied scenario situation. The primary objectives of AIPERS scenario generation techniques are to afford the scenario writer a significantly enhanced capability in terms of speed, flexibility and realism. These objectives will be satisfied by building and maintaining an automated library of messages for use in constructing scenarios, and by providing computerized assistance for those steps of scenario generation which lend themselves to automation.

The remaining sections of this chapter address the procedures required to generate a scenario for an AIPERS exercise; functional specifications for the creation and maintenance of a library of scenario messages; and functional specifications for the automated portions of AIPERS scenario generation.

B. AIPERS SCENARIO GENERATION PROCEDURES

The steps involved in generating a scenario for use by the AIPERS are similar to those currently followed by scenario writers in the DoD intelligence community. These steps are:

- o Formulate the exercise objectives
- o Produce a narrative or statement of a situation, context, or environment for the exercise
- o Define principal events within the situation
- o Select and/or build messages which develop each event, as well as messages which merely add to the bulk of traffic to be processed
- o Time sequence all message traffic

- o Predict analyst's/participant's responses to key events
- o Build the scenario data base and message time list for input to the AIPERS Scenario Processor.

Each of these steps is discussed in more detail in the ensuing subsections.

1. Formulate the Exercise Objectives

The first step in generating a scenario for an AIPERS exercise is to define the objectives of the exercise: that is, to enumerate exactly which aspects of the I&W (or other functional area) center operation are to be exercised as well as the desired outcome of the exercise. These pre-exercise formulated objectives are the determinants of the specific orientation and construction of the scenario to be generated. In an earlier document prepared by INCO, INC., entitled Intelligence Exercise Generation Concept (Final Report, F30602-73-C-0340), a variety of such objectives were identified which are compatible with the design of the Automated Intelligence Exercise and Review System (AIPERS).

2. Define the Scenario Situation

Once the exercise objectives have been clearly stated, the next step is to define a situation, context, or environment for the exercise, which, when the scenario is constructed and the exercise is run, will allow the stated objectives to be achieved. A narrative setting must be produced for each scenario that is constructed in order that participating I&W analysts may have a context in which to view the information contained in the scenario messages.

3. Enumerate the Principal Exercise Events

Once the setting for the scenario has been written, the scenario writer must select the principal events about which messages may be "clustered" in order to fully develop the event. The collection of these principal events should form the substance of the exercise situation, context, or environment.

4. Collect the Scenario Messages

Once the exercise objectives are defined, the scenario narrative is produced, and the principal scenario events are defined, the building of the scenario message traffic can commence. This step of AIPERS scenario generation will be automated, and will be supported by a computerized data base of scenario messages.

a. The Message Library

The objective of developing a library of messages is to enable that any particular message--prepared originally for a specific scenario--may be called up by a key word index, examined by the scenario writer for applicability, edited to conform to the situation of the new scenario, and filed on disk in the scenario data base. For example: were a new scenario being developed which contained references to a low-level confrontation between the Republics of the Philippines and Indonesia, although no messages are in storage regarding that political problem of sovereignty, the key words "sea", "political" and "sovereignty" might be used to retrieve the following message which had been prepared for a past exercise:

In a communique released this date, the foreign Ministry of the Republic of China has reaffirmed its stand with respect to ownership of the Pescadores Island Group and the inter-island waters, in addition to unidentified limits seaward from each island. It was further stated that the Republic of China Government would consider the licensing of fishing vessels to enter those waters. (UPI)

By identifying the words "Pescadores Island Group" and "China", they may be edited to refer to an island group in the Celebes Sea between the two nations in the new scenario to render it applicable. The time saved in producing this single message is readily apparent.

b. The Key Word Index

Major categories of indices must first be selected. Because the location of an event in a message will undoubtedly prove to be more easily altered (edited) at a CRT than the nature of the event itself, place names appear to be less suitable as a first-order index. Pursuing a comparison of other options, a "most-probable to succeed" choice may be that of (1) land (2) sea (3) air. Two of the categories inherently narrow the possibilities of geographical location as bonus attributes. As an initial hierarchical structure of key words for message retrieval, the array subsequently provided is suggested.

c. The Key Word Hierarchy

The Array

- | | |
|----------|----------------------------------|
| I. Land | A. Economic |
| II. Sea | B. Political |
| III. Air | C. Military |
| | D. Scientific/Technological R&D. |

The third level of the hierarchy comprises a variety of subject categories for each of the preceding ones (A-D). The economic heading is broken down thusly:

A. Economic

- | | |
|-------------------|--------------------------------------|
| 1. Trade | 8. Agriculture |
| 2. Fishing | 9. Planning |
| 3. Mining | 10. Seizures (Expropriations) |
| 4. Transportation | 11. Disasters (Earthquakes, Weather) |
| 5. Services | 12. Assessments |
| 6. Financial | 13. Agreements |
| 7. Conferences | |

The political heading is subdivided:

B. Political

- | | |
|-------------------|-------------------|
| 1. Coup d'Etat | 10. Seizures |
| 2. Assassinations | 11. Disasters |
| 3. Elections | 12. Disturbances |
| 4. Sovereignty | 13. Censorship |
| 5. Territory | 14. Personalities |
| 6. Conferences | 15. Assessments |
| 7. Diplomatic | 16. Propaganda |
| 8. Appointments | 17. Announcements |
| 9. Defections | 18. Agreements |

The military heading is subdivided:

C. Military

- | | |
|--------------------|---------------------|
| 1. OB Long Rng Air | 8. OB Nav Surf. |
| 2. OB Tac Air | 9. OB Nav Submarine |
| 3. OB SSM | 10. OB Nav Air |
| 4. OB SAM | 11. OB Nav Missiles |
| 5. OB ASM | 12. OB Other |
| 6. OB Other Air | 13. Alerts |
| 7. OB GRND | 14. Movements |

- | | |
|------------------|-------------------------|
| 15. Insurgence | 24. Intell Coll. |
| 16. Equipment | 25. ELINT |
| 17. Conscription | 26. NSOC |
| 18. Personnel | 27. NOSIC |
| 19. Planning | 28. DIPOLES |
| 20. Personality | 29. IRDHS |
| 21. Environment | 30. Seizures, Incidents |
| 22. Assessments | 31. General Operations |
| 23. Recce Opns. | 32. Agreements |

The scientific/technological, R&D heading is subdivided:

D. Scientific/technological, R&D

- | | |
|----------------|----------------|
| 1. Facilities | 5. Planning |
| 2. Equipment | 6. Conferences |
| 3. Events | 7. Assessments |
| 4. Personality | |

d. Messages Not Yet in the Library

It is not contemplated that there will always be a suitable message in the library for adaptation to a new scenario; however, the availability of such a message any significant part of the time will conserve great amounts of generation effort. In those cases when a message is not available, a new message can be generated and added to the scenario data base. All such new messages will be added to the message library. Thus, successive efforts will continue to enhance the scenario message library.

e. Scenario Message Hard Copy Production

Once all messages for the scenario have been selected, it will be necessary to provide a hard copy of these messages for the further scenario generation steps. This will be provided by copying the disk-resident scenario data base to a line printer.

5. Time Sequence the Message Traffic

Once the data base of scenario messages has been built, the next step of scenario generation is to time sequence the message traffic for delivery to the I&W center host computer during the exercise. This is done by assigning each message a "time tag:" the value in hours, minutes, and seconds from the beginning of the exercise that the message is to be delivered to the analyst/player's CRT.

6. Predict Analyst's Responses

Once all message traffic has been selected and time-sequenced, it is then possible to predict analyst's reactions to discrete messages or groups of messages during a specific time frame in the exercise. The scenario writer must determine which scenario messages represent key events and must furnish possible responses (analyst's actions) with assigned values for these responses. See Chapter IV of this document for more information concerning anticipated analyst's responses and their use in the AIPERS exercise.

7. Build the Scenario Data Base and Message Time List

This final step of AIPERS scenario generation is automated, and allows the scenario generation routines to build the input to the AIPERS Scenario Processor. During this phase of the process, the assigned time tags for each scenario message are entered into the Message Time List file, and the anticipated analyst's responses to the key events are formatted into data records which are stored into the scenario data base. Once this final step of scenario generation is completed, all necessary inputs to the AIPERS exercise (the scenario data base and the Message Time List) will be available, on disk, for use by the Scenario Processor.

C. FUNCTIONAL SPECIFICATIONS FOR THE SCENARIO MESSAGE LIBRARY

In the preceding section, the concept for maintaining a library of messages catalogued under a specific key word hierarchy as a scenario generator tool was outlined in general terms. This section introduces specific design considerations relating to the structure of the Message Library and the Key Word Index hierarchy on a mass storage device, and relating to the processing requirements for creation and maintenance of such a library.

1. Message Library Storage Structures

It has been determined that the Message Library and associated Key Word Index adapts well to a hierarchical (tree) file structure and that it will be convenient to make use of the specific tree-structuring method employed by the TOSS Information Management System (TIMS) to build, maintain, and gain access to the Library on disk.

A tree structure corresponds to the hierarchic segmentation of a dictionary. The highest-level dictionary points to a second-level dictionary, and so on, until the bottom-level dictionary points to information records. The application of the tree for the Key Word Index requires a three-level "dictionary" with a fourth level composed of message records. A "set" of level-four records will consist of pointers to all of those messages referred to by a specific 3-key index. TIMS allows storage of the messages themselves in the same physical file as the index, separating index-record blocks from message-record blocks; alternatively, messages may be stored in a separate file and their addresses stored as level-four data in the Key Word Index. The former scheme provides a slight edge in retrieval time, while the latter decreases the storage required when single messages are referenced by more than one 3-key index.

Relating the selected tree structure to the key word hierarchy described in the previous section, there are category descriptors at three levels, with external (user) access provided via a 3-key index consisting of a Roman numeral (level 1), an alphabetic character (level 2), and an Arabic numeral (level 3). Note that one additional category has been added: No Category. This is to accept new messages input to the library from a scenario writer during scenario generation. The following categories are suggested:

Level 1 Keys

- I. Land
- II. Sea
- III. Air
- IV. No Category

Level 2 Keys

Under level 1 categories I, II, and III (Land, Sea, and Air):

- | | |
|--------------|----------------------------------|
| A. Economic | C. Military |
| B. Political | D. Scientific/Technological, R&D |

Under level 1 category IV (No Category):

- E. No Category

Level 3 Keys

Under level 2 Category A (Economic):

- | | |
|-------------------|-----------------|
| 1. Trade | 8. Agriculture |
| 2. Fishing | 9. Planning |
| 3. Mining | 10. Seizures |
| 4. Transportation | 11. Disasters |
| 5. Services | 12. Assessments |
| 6. Financial | 13. Agreements |
| 7. Conferences | |

Under level 2 Category B (Political)

- | | |
|-------------------|-------------------|
| 1. Coup d' Etat | 10. Seizures |
| 2. Assassinations | 11. Disasters |
| 3. Elections | 12. Disturbances |
| 4. Sovereignty | 13. Censorship |
| 5. Territory | 14. Personalities |
| 6. Conferences | 15. Assessments |
| 7. Diplomatic | 16. Propaganda |
| 8. Appointments | 17. Announcements |
| 9. Defections | 18. Agreements |

Under level 2 Category C (Military):

- | | |
|---------------------|-------------------------|
| 1. OB Long Rng. Air | 17. Conscription |
| 2. OB Tac Air | 18. Personnel |
| 3. OB SSM | 19. Planning |
| 4. OB SAM | 20. Personality |
| 5. OB ASM | 21. Environment |
| 6. OB Other Air | 22. Assessments |
| 7. OB GRND | 23. Recce Opns. |
| 8. OB Nav Surf. | 24. Intell Coll. |
| 9. OB Nav Submarine | 25. ELINT |
| 10. OB Nav Air | 26. NSOC |
| 11. OB Nav Missiles | 27. NOSIC |
| 12. OB Other | 28. DIPOLES |
| 13. Alerts | 29. IRDHS |
| 14. Movements | 30. Seizures, Incidents |
| 15. Insurgency | 31. General Operations |
| 16. Equipment | 32. Agreements |

Under level 2 Category D (Scientific/Technological, R&D):

- | | |
|----------------|----------------|
| 1. Facilities | 5. Planning |
| 2. Equipment | 6. Conferences |
| 3. Events | 7. Assessments |
| 4. Personality | |

Under level 2 Category E (No Category)

1. No Category (For level 1 Category IV only)

2. Message Library Creation and Maintenance

Computer programs must be developed for the creation and maintenance of the Message Library and Key Word Hierarchic Index on disk. Such programs must perform the functions of adding messages to the library, refiling messages under different categories, deleting messages from the library, and publishing subsets of the library for review. Each of these functions is specified in more detail in the following subsections. It should be noted that the function of library maintenance is currently viewed as a computerized batch stream job rather than an on-line, interactive function.

a. Adding Messages to the Library

The function of adding messages to the Message Library and Key Word Index is performed by two separate AIPERS Scenario Generation components. The addition of messages created during scenario generation steps by the scenario writer will be discussed in a later section.

The procedure for introducing a message into the Message Library and cataloguing it in the Key Word Index involves the following steps:

- (1) Accept message text input from the batch input stream and store it in the Message Library under a unique identifier.
- (2) Accept a three-key index under which the message is to be catalogued.
- (3) Search level 1 of the index file for the level-1 key.
- (4) Search only the subset of level 2 of the index file which is subordinate to the found key on level 1 for the level-2 key.
- (5) Search only the subset of level 3 of the index file which is subordinate to the found key on level 2 for the level 3 key.
- (6) Store the unique message identifier into message set related to the found key on level 3.

(7) Return to step (2), repeating until the message has been completely catalogued.

(8) Store the list of categories, under which the message has been filed, as a descriptor record to the message record in the Message Library.

(9) Update the message identifier to reflect the next available unique message ID.

(10) Return to step (1), repeating until all messages have been entered into the library.

The processing to perform each iteration of steps (3), (4), (5), and (6) is accomplished automatically by calling TIMS. The remaining processing steps must be performed by the message addition program itself.

b. Deleting Messages From the Library

The procedure for deleting superfluous messages from the Message Library and the Key Word Index involves the following steps:

(1) Accept the unique message identifier of the message to be deleted from the batch input stream.

(2) Read the descriptor record for the specified message, which contains the categories under which the message is referenced, in from the Message Library.

(3) Obtain a three-level key under which the message is filed.

(4) Search level 1 of the index file for the level-1 key.

(5) Search only the subset of level 2 (in the index file) which is subordinate to the found key on level 1 for the level-2 key.

(6) Search only the subset of level 2 (in the index file) which is subordinate to the found key on level 2 for the level-3 key.

(7) Delete the reference to the specified message from the message set related to the found key on level 3.

(8) Return to step (3) repeating until all references to the message have been deleted from the index file.

(9) Delete the message record and message descriptor record from the Message Library file.

(10) Return to step (1), repeating until all messages to be deleted have been processed.

The processing to perform each iteration of steps (2), (4), (5), (6), (7), and (9) is accomplished automatically by calling TIMS. The remaining processing steps must be performed by the message deletion module itself.

c. Refiling Messages Under Different Categories

It is necessary to provide the capability to refile messages under different categories in the Key Word Hierarchical Index. Specifically, the ability to add a category reference, to delete a category reference, and the ability to move a message reference from one category to another must be accommodated.

To add a category reference to a message, the following processing steps are required:

(1) Obtain the message identifier and the new three-level key under which it is to be referenced from the batch input stream.

(2) Search level 1 of the index file for the level 1 key.

(3) Search only the subset of level 2 (of the index file) which is subordinate to the found key on level 1 for the level-2 key.

(4) Search only the subset of level 3 (of the index file) which is subordinate to the found key on level 2 for the level-3 key.

(5) Add the message identifier reference in the message set related to the found level-3 key.

(6) Add the new category reference to the message descriptor record in the Message Library file.

In the above processing steps, calls to TIMS perform steps (2), (3), and (4). The refile program, in conjunction with TIMS directives, must perform all other processing steps.

To delete a category reference from a message, the steps are the same as above with the exception that in steps (5) and (6) the message reference is deleted rather than added.

To move a category reference from one three-level index to another, the processing steps performed are those for category deletion, followed by the category addition steps beginning with step (2).

d. Reviewing Library Contents

In order that the contents of the Message Library and the Key Word Hierarchical Index can be monitored, it is necessary to provide the ability to review the contents of each of these subsets.

To review the contents of the Key Word Hierarchical Index, the following processing steps are required:

- (1) From the batch input stream, accept the starting index file category to be reviewed and the ending index file category to be reviewed.
- (2) Search the index file for the specified starting level-1 category.
- (3) Search the subset of level 2 (of the index file) which is subordinate to the found level-1 key for the starting level-2 key.
- (4) Search the subset of level 3 (of the index file) which is subordinate to the found level-2 key for the starting level-3 key.
- (5) Retrieve the message set associated with the level-3 key and publish all message identifiers there.
- (6) If the three-level index processed was the ending category to be reviewed, then terminate.
- (7) Traverse the tree to the next level-3 entry and obtain its subscript. If none exists, then proceed to step (8). Otherwise return to step (5).
- (8) Traverse the tree to the next level-2 entry and obtain its subscript. If no entry exists, then proceed to step (10).
- (9) Traverse the tree to the first level-3 entry subordinate to the current level-2 entry and retrieve its subscript. Return to step (5).

(10) Traverse the tree to the next level-1 entry and retrieve its subscript. Traverse the tree to the first level-2 entry subordinate to this level-1 entry and retrieve its subscript. Return to step (9).

To review the contents of the Message Library, the following processing steps are required:

- (1) From the batch input stream, accept the starting message identifier and the ending message identifier of the subset of the Message Library file to be reviewed.
- (2) Retrieve and publish the text of the next message along with its identifier.
- (3) Repeat step (2) until all requested messages have been published.

D. FUNCTIONAL SPECIFICATIONS FOR THE SCENARIO GENERATOR

It was noted in Section B of this chapter that various portions of scenario generation are to be automated to provide the speed and flexibility necessary in constructing scenarios. Specifically, these steps are the assembling of scenario messages for the exercise, and the building of the scenario data base and the Message Time List for input to the AIPERS Scenario Processor. Thus, the AIPERS Scenario Generator is composed of two primary components: the Scenario Message Review and Selection Component and the Scenario Formatting Component. The functions which each of these components perform are enumerated in the following subsections. The final subsection describes the interfaces between the Scenario Generator components and the remainder of the AIPERS modules.

1. The Scenario Message Review and Selection Component

The purpose of the Scenario Message Selection Component (SMSC) is to provide access to the Message Library and text editing facilities in order to compile the scenario message traffic for an AIPERS exercise. The following processing steps are required in order to build the scenario message traffic for the exercise:

- (1) Log on to the Scenario Generator SMSC.
- (2) Determine whether a new scenario is to be started, or the one under development is to be continued.
- (3) If a new scenario is to be built, create a new scenario message file and scenario index file. If a scenario previously under development is to be continued, open the scenario message file and scenario index file.

(4) Using a menu for user option selection, determine whether the Message Library is to be accessed, a new message is to be created, hard copy printout of the scenario is to be produced, or the procedure is to be terminated. Proceed to step (5), (15), (17), or (18), respectively.

(5) If the Message Library is to be accessed, display the level-1 categories of the Key Word Hierarchical Index for menu selection.

(6) Once a level-1 key is selected, display the appropriate array of level-2 keys for menu selection.

(7) Once a level-2 key is selected, display the appropriate array of level-3 keys for menu selection.

(8) Retrieve the message set referenced by the three-level key from the library index file. This message set contains the message identifiers under which the actual messages are stored in the Message Library file.

(9) Retrieve the next message referenced from the Message Library file. If none remains, return to step (4).

(10) Display the message handling options in the form of a menu selection: review the message, store the message into the scenario, text edit the message, delete the message from consideration, and terminate processing of this set of messages from the library. Depending upon the option selected, proceed to steps (11), (12), (13), (14), or (4), respectively.

(11) If message review is selected, display the message on the terminal screen. Upon indication of completion of the review by the scenario writer, return to step (10).

(12) If the message is to be added to the scenario, create the next scenario message ID, store the message in the scenario data base, and add the message ID to the scenario index. Delete the message reference from the message set and proceed to step (9) above.

(13) If text editing of the message is selected, invoke the message text editor. This editor will allow the insertion, deletion, and replacement of text in the message. Upon termination of text editing, return to step (10) above.

(14) If the message is to be deleted from consideration, remove its entry from the current message set and return to step (9) above.

(15) If a new message is to be created, invoke the message text editing facilities for new message input.

(16) Once message entry is complete, offer the option of either ignoring the message or adding it to the scenario under development. If the message is to be ignored, return to step (4) above. Otherwise, create the next scenario message ID and add the message to the scenario data base. Also add the message to the Message Library, storing a key word index entry to it under category "IV-E-1" (No Category Assigned) in the library index file. Upon completion of this process, return to step (4) above.

(17) If hard copy of the scenario messages is requested, then process each scenario message in the scenario index in sequence. Retrieve each message from the scenario file, format it for output, and queue it to the line printer for publication. The message format should leave space for the manual insertion of a time tag and an anticipated analyst's response array (i.e., the hard copy will be used as a production worksheet prior to the initiation of the Scenario Formatting Component).

(18) If the scenario writer chooses to terminate adding messages to the scenario data base, then the Message Library and scenario files are closed, and the program exits.

It should be noted that much of the processing required to perform the above steps will be greatly simplified by the use of TIMS and an appropriate TOSS (Terminal Oriented Support System) terminal handler such as TTDL (Terminal Transparent Display Language) macro calls.

2. The Scenario Formatting Component

Once all messages have been selected for use in the exercise scenario, it is the purpose of the Scenario Formatting Component of the Scenario Generator to format the scenario data base and the Message Time List file for use by the AIPERS Scenario Processor. This procedure is interruptable, and will be restartable at any point in the process.

The Scenario Formatting Component provides the scenario writer with the ability to review messages before final inclusion in the Scenario, to delete previously included messages from the scenario, and to assign time tags to scenario messages, as well as anticipated arrays of analyst's response when needed. The processing steps required to perform these functions are as follows:

- (1) Log the scenario writer on to the Scenario Generator Scenario Formatting Component.
- (2) Open the scenario data base and scenario index file. Open the Message Time List file. If no MTL file exists, then create a new MTL file.
- (3) Read through the scenario index file until the first message entry not marked "deleted" is found. If all the entries have been processed, then proceed to step (11).
- (4) Retrieve the message referenced by the next scenario index record.
- (5) Present a selection menu of processing functions to the scenario writer for selection. These options are to review the message; to delete the message from the scenario; and to assign a time tag and, possibly, an analyst's anticipated response array to the message. Proceed to processing steps (6), (7), or (8), respectively, depending upon the function selected.
- (6) If message review is selected, format the message for display at the terminal. Once the scenario writer indicates that he is through reviewing the message, return to processing step (5).
- (7) Mark the scenario index record for the message "deleted" (or "already processed"), update the scenario index pointer to the next entry, and return to step (4). If no more entries exist in the scenario index, then proceed to processing step (11).
- (8) If a message is to be included in the scenario, request a time tag in hours, minutes, and seconds from the beginning of the exercise for delivery of the message to the I&W Center host computer. Using this time tag, format an MTL entry for this message. (Such an entry consists of the time tag, the unique message identifier, and space for message status.) Store the MTL entry into the appropriate slot in the MTL file. (The MTL file is kept sorted in ascending order by time tag.)

(9) Request the analyst's anticipated response array and values. (See Chapter IV of this document for more details regarding the format of such an array.) If none is supplied, then return to step (7). Otherwise, store the response array with its associated message in the scenario data base.

(10) Return to step (7) to finish processing of the message.

(11) Upon request for termination of the function, determine if all messages in the scenario index have been processed. If not then simply close the scenario index in anticipation of resuming the procedure at another time; otherwise delete the scenario index file. Close the scenario data base and Message Time List files, and then exit.

Note that, as with the Message Review and Selection Component, much of the processing required to perform the above functions will be greatly simplified by the use of TIMS directives as well as the TOSS terminal handler (TTDL) directives.

3. Scenario Generator Interfaces

Interfaces exist between the internal components of the Scenario Generator, as well as between the Scenario Generator and other AIPERS components. These interfaces all consist of data files, and are briefly described below.

a. Internal Interfaces

The interfaces between the Scenario Message Review and Selection Component and the Scenario Formatting Component consist of the scenario data base which contains all messages selected for entry into the scenario, as well as the scenario index file. The scenario index file contains an entry for each scenario message including its unique identifier and its current status.

b. External Interfaces

All interfaces between the Scenario Generator and other AIPERS components are static: they consist of data files constructed by one component for use by another.

The Message Library Maintenance module creates and maintains the scenario message library for use by the Scenario Generator. The Scenario Generator does store new messages into this library, but leaves the task of categorizing (indexing) new messages for the library maintenance routines.

The Scenario Generator builds the scenario data base and Message Time List file for input to the AIPERS Scenario Processor. Before the exercise is run (i.e., before the Scenario Processor is initiated), all scenario message data and time tag data must be stored in these two files.

CHAPTER III

FUNCTIONAL DESIGN SPECIFICATIONS FOR THE AIPERS SCENARIO PROCESSOR

A. INTRODUCTION

The Scenario Processor of the Automated Intelligence Processes Exercise and Review System (AIPERS) is the focal place of exercise activities within the AIPERS. The functional design specifications for the AIPERS Scenario Processor include all the functions identified as required for retrieving messages from the Scenario data base and delivering them to the designated I&W center's host computer. They also include the functions required by the Control Team to maintain control over the flow of the exercise in near-real-time. The remainder of this chapter discusses the primary functions performed by the Scenario Processor, the auxiliary functions supported by the Scenario Processor, the functional interface between the Scenario Processor and the I&W center's host, and the functional interfaces between the Scenario Processor and the other AIPERS components.

B. PRIMARY SCENARIO PROCESSOR FUNCTIONS

The Scenario Processor performs two primary functions for the AIPERS: it maintains the exercise system clock, and it forwards scenario message traffic to the I&W host computer at the specified time intervals. Each of these functions is discussed further in the following subsections.

1. Exercise Clock Maintenance

The entire AIPERS is based upon timed sequences of events including delivering exercise scenario message traffic to the I&W host at specified time intervals and measuring the analyst's responses to the scenario events during specified timed intervals. Thus, there is a requirement for a centralized AIPERS exercise clock. The Scenario Processor is responsible for maintaining this clock.

The exercise clock measures time from the start of the exercise. It is currently envisioned that this clock will be maintained in seconds from the start of the exercise, although further development of the AIPERS may indicate that an exercise clock kept in minutes from the start of the exercise will provide sufficient accuracy.

2. AIPERS Scenario Message Traffic Processing

The Scenario Processor is the AIPERS component which retrieves exercise messages from the prestored scenario and forwards the messages, as indicated by an attached time tag, to the I&W host.

The pre-stored scenario data base will be generated off-line using the facilities of the AIPERS Scenario Generator (see Chapter II of this document). The Scenario will consist of messages stored as records in the data base and response arrays stored as associated records for each message. As the scenario messages and their associated response arrays are stored in the scenario data base by the AIPERS Scenario Generator, a corresponding entry will be made in the Message Time List (MTL) file. The MTL is a master directory of the exercise scenario and will be used by the Scenario Processor for managing the retrieval and delivery of scenario messages, as well as housekeeping functions for restart and recovery purposes. Each entry in the MTL will contain a unique message identifier; a time tag; and any other pertinent information required by the Scenario Processor for retrieving a message, its response array, or for retaining historical data for restart and recovery. The MTL entries will be sorted in ascending order based upon time tags. The MTL will be blocked, as required, for use by the Scenario Processor. During the initialization process for the AIPERS, the Scenario Processor will read the first MTL block from disk, obtain the exercise elapsed time (the MTL time tag) for the first exercise message, request an entry in the Real Time clock queue, and relinquish control of the processor.

Upon expiration of the Real Time clock queue entry, the Scenario Processor will regain control of the processor (wakeups), retrieve the message from the scenario data base, and forward the message to the I&W host. Following this, the Scenario Processor will update the MTL entry for the message, indicating that it has been forwarded, and it will write the updated MTL block to disk. Any time the MTL block is updated, it will be written to disk for restart and recovery purposes.

As each message is forwarded to the I&W host, the Scenario Processor will notify the Exercise Tracker component so that the tracking data base can be appropriately updated. Upon finishing the processing of each MTL entry the next entry is obtained from the MTL and placed in the Real Time clock queue for processing.

C. AUXILIARY SCENARIO PROCESSOR FUNCTIONS

In addition to its primary functions of timing and forwarding scenario message traffic to the I&W center host, the Scenario Processor also provides support functions used by the AIPERS Control component. These support functions include exercise start, stop, and restart; scenario message retrieval for Control Team review; and scenario alteration by the Control Team. The various auxiliary Scenario Processor functions are enumerated and described in the following subsections. Note that

the AIPERS Exercise Tracker component is notified by the Scenario Processor as each of the following functions is performed:

1. Exercise Start, Stop, and Restart

Part of the Control Team function conducted by the AIPERS Control component is to initiate the exercise system and determine whether to start the exercise from the beginning or to restart it where it was terminated by command or system malfunction. In addition, the Control Team can stop the exercise at any time.

Upon notification of exercise start-up, the Scenario Processor conducts its normal initialization function. This initialization procedure is discussed at length in Section B-2. of this Chapter.

Upon notification by the Control component of exercise restart, the Scenario Processor scans through the MTL until the last message is found which has been previously processed. The exercise clock is then set to the time tag of this message, and processing of the scenario is resumed by placing the next MTL entry onto the Real Time clock queue.

If the Control Team deems it necessary to stop the exercise, the Control component notifies the Scenario Processor of this fact. The Scenario Processor in turn notifies the Exercise Tracking Component, closes all data files, and exits the system.

2. Exercise Pause and Resume

The Control component of AIPERS provides the exercise Control Team with the ability to temporarily suspend the processing of the scenario, as well as the ability to resume the exercise after it has been suspended.

When the AIPERS Control component notifies the Scenario Processor that a pause in the exercise has been requested, the Scenario Processor stops the exercise clock and suspends its operation until further notice. This function allows the I&W center to process any backlog in scenario traffic which may have accumulated. Once the backlog is processed, the Control Team, via the AIPERS Control component, can instruct the Scenario Processor to resume its operation. At this time, the Scenario Processor restarts the exercise clock and continues to process scenario messages as before.

3. Scenario Review

The Scenario Processor is also responsible for supporting the Control component of AIPERS in requests by the Control Team

to review the scenario. The Control component passes requests for scenario message and/or response array review to the Scenario Processor. The Scenario Processor then searches the MTL for the requested message, retrieves the message and/or response array from the scenario data base, and forwards the data to the Control component for display at the Control Team console.

4. Scenario Alteration

The Scenario Processor is responsible for processing all Control Team requests to alter the scenario. These requests, which are forwarded to the Scenario Processor by the AIPERS Control component, include message modification, addition, delay, deletion, and reentry. Each of these functions is described in the following subsections.

a. Message Modification

If, after reviewing a scenario message, the Control Team deems it necessary to modify the message text, the Control component supports text editing functions for message editing. Once the message is modified to the satisfaction of the Control Team, the Control component passes the new text to the Scenario Processor. The Scenario Processor deletes the old message text and replaces it with the new text.

b. Message Addition

The Scenario Processor interfaces with the AIPERS Control component to allow the acceptance of ad hoc messages into the scenario data base from the Control Team. These ad hoc messages will be sent from the Control Team console to the Scenario Processor. The Scenario Processor will append the message to the scenario data base and insert an entry in sequence in the MTL based on the time tag of the ad hoc message. The updated MTL block is then written to disk. There will be no response arrays associated with ad hoc messages.

c. Message Delay

The Scenario Processor accepts requests for message delay from the Control Team via the AIPERS Control component. Once a request for message delay is received, the Scenario Processor deletes the original MTL entry for the message, and inserts the new entry for the message into the MTL. The updated MTL block(s) is then written to disk.

d. Message Deletion

When the Control Team requests that a message be deleted from the scenario, the AIPERS Control component forwards this request to the Scenario Processor for processing. The Scenario Processor marks the message status in its MTL entry "deleted" and writes the updated MTL block to disk.

e. Message Reentry

The Scenario Processor accommodates requests for scenario message reentry. These requests are originated by the Control Team, and are passed to the Scenario Processor by the AIPERS Control component. Upon receiving such a request, the Scenario Processor looks up the message's MTL entry and marks it "not deleted." If the time tag for delivery of the message to be reentered has also been changed, then the Scenario Processor deletes the old MTL entry for the Message and inserts a new entry for the message into the proper sequence in the MTL. In either case, all affected MTL blocks are written to disk for restart and recovery purposes.

D. SCENARIO PROCESSOR FUNCTIONAL INTERFACES

The Scenario Processor interfaces with the I&W center's host computer as well as with the various other AIPERS components. Each of these interfaces is described in the following subsections.

1. External Interfaces

The Scenario Processor interfaces with the I&W center's host computer for the purpose of transmitting exercise scenario message traffic to the analysts participating in the exercise. It is currently assumed that the I&W host will route the scenario messages to the appropriate participating analyst's station(s).

2. Internal Interfaces

Internal to the AIPERS, the Scenario Processor has both passive and active interfaces with various AIPERS components. A passive interface exists between the AIPERS Scenario Generator and the Scenario Processor in that the Scenario Generator builds the scenario data base and the Message Time List prior to initialization of the exercise. The Scenario Processor takes over control of these two data files upon start up of the exercise.

During the course of the exercise, the Scenario Processor maintains active interfaces with the AIPERS Control component

and the AIPERS Tracking component. The Scenario Processor accepts inputs from the AIPERS Control component for the purpose of near-real-time exercise flow control and for scenario modification. The AIPERS Tracking component is notified by the Scenario Processor every time the Scenario Processor completes a discrete function. These functions include the transmission of each message to the I&W center's host computer and the processing of Control Team requests.

CHAPTER IV

TECHNICAL ASPECTS OF METHODOLOGIES FOR APPLYING DECISION IMPACT ANALYSIS TO AUTOMATED EXERCISE CONTROLS

A. INTRODUCTION

During the execution of an exercise, a major concern with respect to player participation is the matter of how he may respond to discrete or collective scenario stimulations. How he may respond is germane because an aberrant response may well precipitate undesirable exercise trends. Exercise activity levels may become unacceptably high or low, future event stimulators of the scenario may be preempted, or the accomplishment of exercise objectives may be precluded. For these, and perhaps myriad other reasons, the predictable consequences of such responses would be desirable as Control Team information. As was earlier noted (in RADC-TR-75-252), the goal of decision impact analysis, "...at any point in time is to provide an assessment of the potential, possible, probable or known, impact that an analyst's choice of optional activities may have upon the exercise at the time of choice or at a later time."

The analysis of the impact which player decisions can have may be made initially at the time of scenario generation. At the moment of event selection, an array of possible responses--in the context of the total scenario exposed to that time--should be developed. Without such an array, the timely consideration of analyst actions would be difficult at best. It is essential to note that arrays for each exercise scenario will vary significantly. They will, in fact, vary for the same event in separate exercises because the context, world political scene, and exercise parameters will differ.

Excursions into the attempted definition and articulation of Decision Impact Analysis have indicated that to know what it is not is most probably as significant as to know what it is. In this chapter, therefore, both issues will be addressed. Any success that may be achieved in the conversion of analyst's responses to scenario stimulations into quantitative values for error signal generation will be predicated upon the clear, unambiguous definition of the functional expanse of Decision Impact Analysis.

B. TIME STRUCTURED FILES

Assessments of the impact of decisions made by exercise participants at any time are highly dependent upon the availability of time structured files of information. Each scenario event must be given a finite time window during which it must be processed and those time windows must be constantly available to the Control Team. With such an aid, the Control Team will be able to look ahead at scenario events to determine whether a player decision at t_1 will have any impact upon the planned activities at t_n . This, however, is in a manual mode of analysis.

The automation of response assessment is predicated upon comparisons of player actions with those which were designed into the scenario with anticipated response arrays. In the following example, the generation of decision impact analysis error signals will be traced.

SCENARIO ELEMENT

AES-000011

FM: DATT, TAIWAN
 TO: INCO, INC. INTEL. SIM. CTR.
 RE: BROUHAHA IN OFF-SHORE WATERS OF TAIWAN
 REF: OPER. INTEL. REPORT REQ.
 DTG: 11 1800 OCT 00

THE FOLLOWING MESSAGE FROM THE REUTER'S NEWS AGENCY IS TRANSMITTED VERBATIM FOR YOUR INFORMATION. TAIPEI, TAIWAN 11 OCTOBER. THE MINISTER OF FOREIGN AFFAIRS FOR NATIONALIST CHINA SPEAKING BEFORE A GROUP OF DIPLOMATIC PERSONNEL IN TAIPEI ON THE ANNIVERSARY OF THE REPUBLIC, ALLUDED ON SEVERAL OCCASIONS TO THE HISTORIC ATTACHMENT OF VARIOUS ISLAND GROUPS TO CHINA. SPECIFIC REFERENCE WAS MADE TO THOSE BETWEEN THE BASHI AND BALINTANG CHANNELS. THE REASON FOR THIS CONTENTION IS UNCLEAR, AND THE INTERNATIONAL RESPONSE IS EXPECTED TO BE VIGOROUS.

Given that the message was received in a sufficiently meaningful context of on-going events, it could be anticipated that the analyst or exercise player would respond in a manner within predictable limits. If this were also the initial message on the subject, and if the objectives of the exercise included reviewing analyst's procedures, the array of responses would probably resemble the following:

<u>DTG</u>	<u>VALUE</u>	<u>ACTIONS TAKEN</u>	<u>RESPONSE</u>
11 1800	a. +4	5	Flag item for briefing, and
	b. +3	4	Request additional info from DATT, and
	c. +2	3	Request ANALIT from PACOM, and
	d. +0	2	Refer to B.E./Gazetteer for exact location and then refer to map
	e. -1	1	Refer to map for location
	f. -1.5	0	Does nothing

The spread of values in this instance is small; positive values represent varying degrees of over-response and negative values represent under-response. Considering that, at this time, the message appears quite routine, to do nothing about it is judged to be less inappropriate than to stir up collection resources. It does seem appropriate, however, that the analyst should ascertain the geographical locations of the referenced and

obscurely named channels. Subsequent events in their proximity might cause the contents of this message to have greater meaning. Assume the passage of routine I&W and current intelligence traffic for the following three hours and then the receipt of the next message.

AES-000021

FM: DIRNSA
TO: INCO, INC. INTEL. SIM. CTR.
RE: PHILIPPINE NAVAL UNITS SEIZE JAPANESE FISHING VESSELS
REF: OPER. INTEL. REPORT REQ.
DTG: 11 2100 OCT 00

COAST GUARD UNITS OF THE PHILIPPINE NAVY ARE REPORTED TO HAVE SEIZED A NUMBER OF JAPANESE FISHING VESSELS IN THE VICINITY OF THE BATAN ISLANDS. JAPANESE CREWS HAVE BEEN PLACED IN CUSTODY OF THE COAST GUARD DETENTION FACILITY OFFICIALS AT APARRI. DISPOSITION OF THE VESSELS IS UNKNOWN. THIS IS THE FIRST KNOWN INSTANCE OF PHILIPPINE SENSITIVITY ABOUT THE OFF-SHORE WATERS OF THE ISLAND GROUP. NO STATEMENT HAS BEEN MADE BY PHILIPPINE OFFICIALS REGARDING THE INCIDENT SO FAR.

DTG	VALUE	ACTIONS		RESPONSE - INITIAL
		TAKEN		
11 2100	a. +6	6	Requests traffic analysis by DIRNSA (prior 5 days), and	
	b. +4	5	Activates collection effort/notifies C&C element, and	
	c. +2	3	Alerts team chief of incipient crisis, and	
	d. +0	2	Refers to B.E./Gazetteer for locations of Batan Islands and Aparri and then to map	
	e. -1	1	Queries OB files for information regarding P.I. coast guard equipment	
	f. -3	0	Does nothing	

RESPONSE - SECOND

a. +8	5	Requests DIRNSA traffic analysis, requests PACOM ANALIT, and
b. +4	3	Notifies C&C element of crisis, and
c. +2	2	On basis of 11 2100 Oct msg. alone, generates briefing item, and
d. +0	1	Recalls msg. of 11 1800 Oct for review and correlation of information with that of 11 2100 Oct
e. -2	1	Consults with area analyst for history of such events
f. -4	0	Does nothing

The second message introduces two additional place names into the scenario, names which probably will not be readily familiar to the exercise player unless he happened to be a specialist on the Philippine Islands. It would seem likely that he would again ascertain the locations where the reported events occurred as a first response. As in the first instance, the event in isolation lacks any great significance; but when viewed in light of the former message, it may arouse curiosity or concern. It is assumed that the analyst would seek to review the earlier message and correlate the two as being related.

The values assigned to the spectrum of responses are subjective and, perhaps, somewhat arbitrary; but experience gained from the frequent experimentation with response arrays should provide more accurate techniques of relative weighting.

To carry the methodology further, and then to illustrate error signal generation by Control Team use of tracker information, consider these subsequent messages:

AES-000023

FM: FBIS
TO: INCO, INC. INTEL. SIM. CTR.
RE: RADIO PEKING CRITICIZES PHILIPPINE SEIZURES
REF: DIRNSA MSG 11 2100 OCT 00
DTG: 120130 OCT 00

THE FOREIGN BROADCAST INFORMATION SERVICE REPORTS THAT A CHI COM SPOKESMAN OVER RADIO PEKING CRITICIZED THE PHILIPPINE USE OF NAVAL FORCE IN INTERNATIONAL WATERS. THE CRITIC REFERRED TO THE INCIDENT AS HAVING OCCURRED IN PRC COASTAL WATERS. THE CONTEXT IN WHICH THE CRITICISM WAS MADE IS OBSCURE. THERE HAVE BEEN NO KNOWN PHILIPPINE INTRUSIONS INTO PRC TERRITORIAL WATERS.

AES-000027

FM: DEPARTMENT OF STATE
TO: INCO, INC. INTEL. SIM. CTR.
RE: REQUEST FOR ASYLUM, MARIA TOLMOY TORSO
REF: DOD REQ. FOR INFO
DTG: 12 0300 OCT 00

MARIA TOLMOY TORSO, DAUGHTER OF GEORGE TOLMOY, CHAIRMAN OF THE EAST PACT CENTRAL COMMITTEE, HAS REQUESTED ASYLUM IN THE UNITED STATES. SHE HAS BEEN IN RESIDENCE IN MANDO FOR THE PAST TWENTY-TWO MONTHS. HER STATUS WITHIN MANDO HAS BEEN EQUIVALENT TO THAT OF A GUEST OF THE STATE, WITH AN UNLIMITED VISA BUT NO DIPLOMATIC OR OFFICIAL ACCREDITATION. MRS. TORSO WAS BORN ON 29 JUNE 1924

IN PARTOVA, EAST PACT, AND SHE HAS ONE SON, VLADIMIR, WHO RESIDES IN EAST PACT. AT THE PRESENT TIME SHE IS SEPARATED FROM HER SECOND HUSBAND WHO IS A NATIVE OF MANDO. SHE REQUESTS ASYLUM ONLY FOR HERSELF AND GIVES HER REASONS FOR THIS REQUEST AS DESIRE TO FIND SAFETY, SECURITY, AND PEACE OF MIND IN THE WEST. HER CLOSE ASSOCIATION WITH HER FATHER OVER THE LAST TWO DECADES SHOULD PROVIDE AN INTIMATE AND SOUND BASE FOR A SCHOLARLY REVIEW OF THE SOCIO-POLITICAL SITUATION IN EAST PACT FOR THE PAST 20 YEARS.

AES-000032

FM: DEPT. OF STATE
TO: INCO, INC. INTEL. SIM. CTR.
RE: CHINA PROTESTS USE OF U.S. AID BY PHILIPPINES
REF: DIRNSA 11 2100 OCT 00
DTG: 12 1930 OCT 00

NATIONALIST CHINA HAS LODGED A PROTEST WITH THE U.S. STATE DEPARTMENT REGARDING THE USE OF MILITARY AID EQUIPMENT BY THE PHILIPPINE GOVERNMENT DURING THE SEIZURE OF JAPANESE FISHING VESSELS IN THE BASHI CHANNEL. THE BASIS FOR THE CHI NAT INTRUSION INTO THE AFFAIR IS THE CLAIM THAT THE BATAN ISLANDS ARE HISTORICALLY CHINESE.

AES-000035

FM: FBIS
TO: INCO, INC. INTEL. SIM. CTR.
RE: TAIWAN THREATENS U.S. USE OF CCK AIRBASE
REF: DEPT. OF STATE MSG 12 1930 OCT 00
DTG: 12 2200 OCT 00

A FOREIGN BROADCAST INFORMATION SERVICE REPORT INDICATES THAT TAIPEI LEADERS ARE SERIOUSLY CONSIDERING THE ABROGATION OF THE AGREEMENTS WITH THE U.S. OVER THE USE OF CCK AIR BASE BY THE U.S. AIR FORCE. CCK IS OF MAJOR IMPORTANCE TO THE CONTINUED PRESENCE OF U.S. AIR POWER IN THE WESTPAC AREA. THE REASON FOR CONSIDERING CLOSURE OF THE BASE IS SOMEWHAT OBSCURE IN THAT ITS USE IS INCORPORATED IN THE REPUBLIC OF CHINA -- U.S. MUTUAL DEFENSE PACT.

AES-000036

FM: DATT, PHILIPPINES
TO: INCO, INC. INTEL. SIM. CTR.
RE: PHILIPPINES MAY RESTRICT USE OF U.S. BASES THERE
REF: DIRNSA MSG 121930 OCT 00
DTG: 13 0200 OCT 00

DISCUSSIONS WERE ENTERED INTO THIS DATE WITH COL. ROMULO, AN AIDE TO THE PHILIPPINE DEFENSE CHIEF. THE AIDE IMPLIED THAT PRESIDENT MARCOS WILL OPENLY SOLICIT REASSURANCE OF U.S. SUPPORT WITH REGARD TO THE BATAN ISLANDS SOVEREIGNTY CONTROVERSY WITH NATIONALIST CHINA. IT WAS INDICATED THAT MARCOS WOULD CONSIDER ANYTHING OTHER THAN A POSITIVE RESPONSE TO BE AMPLE REASON TO WARRANT A SERIOUS REVIEW OF THE STATUS OF BOTH CLARK AIR BASE AND THE NAVAL FACILITIES OF SUBIC BAY. AS A MINIMUM PHILIPPINE REACTION, THE PROHIBITION OF U.S. AIRCRAFT USING CLARK A.B. IN CONJUNCTION WITH FLIGHTS TO OR FROM TAIWAN WOULD BE EXPECTED.

AES-000039

FM: US NAVAL INTEL CTR.
TO: INCO, INC. INTEL. SIM. CTR.
RE: CHINA/PHILIPPINE NAVAL MOVEMENTS
REF: OPER. INTEL. DEPT. REQ.
DTG: 13 0600 OCT 00

CHINESE NATIONALIST NAVAL DESTROYER NO. T-017 REPORTED TO BE LOCATED 25 NM DUE SOUTH OF SOUTHERN TIP OF TAIWAN MOVING ON A TRUE BEARING OF 125 DEGREES AT 2016 ZULU 13 OCTOBER. REPUBLIC OF PHILIPPINES TORPEDO BOATS (2) P-123, P-267 SIGHTED 30 MILES N-NW OF LINGAYEN ON COURSE TOWARD BALINTANG CHANNEL. 2003 ZULU 13 OCTOBER.

AES-000041

FM: AIRLO, HONG KONG
TO: INCO, INC. INTEL. SIM. CTR.
RE: GARUDA B-707 POSSIBLY DOWN
REF: OPER. INTEL. REPORT REQ.
DTG: 13 1000 OCT 00

FOLLOWING IS A VERBATIM TRANSMISSION OF A HONG KONG NEWS RELEASE DATED 13 OCTOBER, HONG KONG. HONG KONG NEWS HAS REPORTED THAT A GARUDA AIRLINES BOEING 707 IS BELIEVED TO BE DOWN AT SEA SOUTH OF TAIWAN. THE AIRCRAFT, FLIGHT B216 WAS BOUND FOR JAKARTA FROM TOKYO AND WAS LAST HEARD FROM AT A LOCATION 100 MILES N.E. OF HUALIEN, TAIWAN. THE FLIGHT CARRIED 123 PASSENGERS PLUS CREW AND DEPARTED TOKYO INTERNATIONAL AIRPORT AT 1710 ZULU ON 13 OCTOBER. OFFICIALS OF A NATIONALIST CHINESE TRADE COMMISSION WERE REPORTED TO HAVE BEEN ABOARD.

AES-000044

FM: DIRNSA
TO: INCO, INC. INTEL. SIM. CTR.
RE: PHILIPPINE ARTILLERY COMMO. REG. AIR SCHEDULES
REF: ROUTING COMMO. REPORTING
DTG: 13 1200 OCT 00

USN VOICE INTERCEPT OF CONVERSATION BETWEEN PHILIPPINE ARMY COASTAL ARTILLERY POST AT AN UNDISCLOSED LOCATION AND A HEADQUARTERS ELEMENT IN THE MANILA AREA REVEALED THAT SPECIAL INTEREST HAD BEEN GENERATED WITH REGARD TO INTERNATIONAL AIR ROUTES TRAVERSING WATERS ADJACENT TO LUZON. REFERENCES TO FLIGHT NUMBERS AND ETAS TO REPORTING POINTS WERE MADE. THE INTEREST OF A COASTAL ARTILLERY UNIT IN SUCH MATTERS IS UNUSUAL AND ITS PURPOSE OBSCURE. PORTIONS OF THE CONVERSATION REVERTED TO TAGALOG AND HAVE NOT BEEN TRANSLATED.

AES-000047

FM: DEPT. OF TRANSPORTATION
TO: INCO, INC. INTEL. SIM. CTR.
RE: ICAO REQUESTS U.S. RESCUE SEARCH ASSIST
REF: AIRLO HONG KONG MSG 13 1000 OCT 00
DTG: 13 1300 OCT 00

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) OFFICIALS HAVE REQUESTED THE UNITED STATES TO PARTICIPATE IN SEARCH OPERATIONS BEING ORGANIZED TO FIND A MISSING GARUDA AIR 707. THE AIRCRAFT IS BELIEVED TO HAVE DISAPPEARED DURING EARLY MORNING HOURS OF 13 OCTOBER IN THE VICINITY OF BATAN ISLANDS NORTH OF LUZON. U.S. AIRCRAFT MAY USE CLARK AB ON LUZON OR CCK ON TAIWAN IF AGREEMENT IS REACHED WITH THE RESPECTIVE GOVERNMENTS.

Based upon the foregoing sequence of messages which progressively ties together what were, upon first analysis, unrelated events, discrete response arrays may be structured prior to the exercise. Subsequently, the response values for "actions taken" as opposed to predicted responses will be assembled into an activity profile. The following response arrays are related to message DTGs.

<u>DTG</u>	<u>VALUE</u>	<u>ACTIONS TAKEN</u>	<u>RESPONSE</u>
12 0130	a. +4	5	Flags events for Indications watch, and
	b. +3	4	Requests ANALIT from PACOM, and
	c. +2	3	Requests State Department analysis of territorial questions seemingly involved, and
	d. +0	2	Designates the accumulating events as an area of continued interest. Constructs working file to track events.
	e. -3	1	Fails to develop working file
	f. -4	0	Takes no action
12 0300	a. +2	2	Requests biographic data on Maria Torsa, and
	b. +0	1	Checks out locations and relationships of MANDO and EAST PACT
	c. -2	0	Disregards message
12 1930	a. +4	3	Requests PACOM ANALIT, and
	b. +2	2	Requests amplifying information from STATE, and
	c. +0	1	Adds message info to working files
	d. -2	0	Does nothing
12 2200	a. +4	4	Requests further info from STATE, and
	b. +2	3	Tasks NSA for relevant information, and
	c. +0	2	Relays information to C&C duty officer and flags events to date
	d. -2	1	Relays information to C&C element only
	e. -5	0	Does not contact C&C element
13 0200	a. +4	4	Tasks DATT for additional info, and
	b. +2	3	Seeks additional info from STATE, and
	c. +0	2	Adds message info to working files; passes info to C&C element
	d. -3	1	Fails to notify C&C element
	e. -5	0	Fails to add message to working files or pass info to C&C element
13 0600	a. +5	6	Queries CINCPAC for additional info, and
	b. +3	5	Requests amplifying info from NOSIC, and
	c. +0	4	Plots locations of reported events, passes info to C&C element, adds message info to working files. Requests info on any U.S. naval vessels in area.
	d. -3	2	Only plots location of reported events and passes info to C&C element
	e. -6		Fails to notify C&C element but takes other +0 actions

<u>DTG</u>		<u>VALUE</u>	<u>ACTIONS TAKEN</u>	<u>RESPONSE</u>
13 1000	a.	+0	5	Alerts and requests available info from DATT/Manila and Taipei. Flags event as possibly related to previous messages relating to CHINAT/PHILIPPINE controversy. Requests related info from NSA. Requests ANALIT from CINCPAC.
	b.	-3	3	Fails to query NSA and to associate event with previously reported controversy
	c.	-5	2	Fails to query NSA, to correlate event and to request ANALIT
	d.	-10	0	Fails to seek any additional information or to take any relevant action
13 1200	a.	+3	6	Requests STATE to make inquiries in Manila, and
	b.	+2	5	Requests 13AF I&W center for additional information, and
	c.	+0	4	Flags event of downed airlines as "hot news." Correlates intercept info with possible shoot down. Begins to assemble a briefing item. Advises C&C element.
	d.	-5	1	Correlates intercept info with possible shoot down
	e.	-8	0	Fails to take any of above actions
13 1300	a.	+0	2	Passes info to C&C element. Uses data in briefing item which supposes shoot down of a Garuda airliner.
	b.	-2	1	Fails to take one of above actions
	c.	-4	0	Fails to take both actions above

The response arrays which have been presented are so structured that a constant activity level of +0 represents that proper actions are being taken. If it is postulated that the actual analyst's activities were as next indicated, an activity profile may be constructed. (see Figure IV-1)

<u>DTG</u>	<u>RESPONSE</u>	<u>VALUE</u>	<u>NO. OF ACTIONS TAKEN</u>	<u>DTG</u>	<u>RESPONSE</u>	<u>VALUE</u>	<u>NO. OF ACTIONS TAKEN</u>
11-1800	c.	+2	2	12-2200	c.	+0	2
11-2100	b.	+4	2	13-0200	b.	+2	2
11-2100	c.	+2	1	13-0600	b.	+3	4
12-0130	d.	+0	2	13-1000	a.	+0	5
12-0300	a.	+2	1	13-1200	a.	+3	4
12-1930	a.	+4	1	13-1300	a.	+0	2

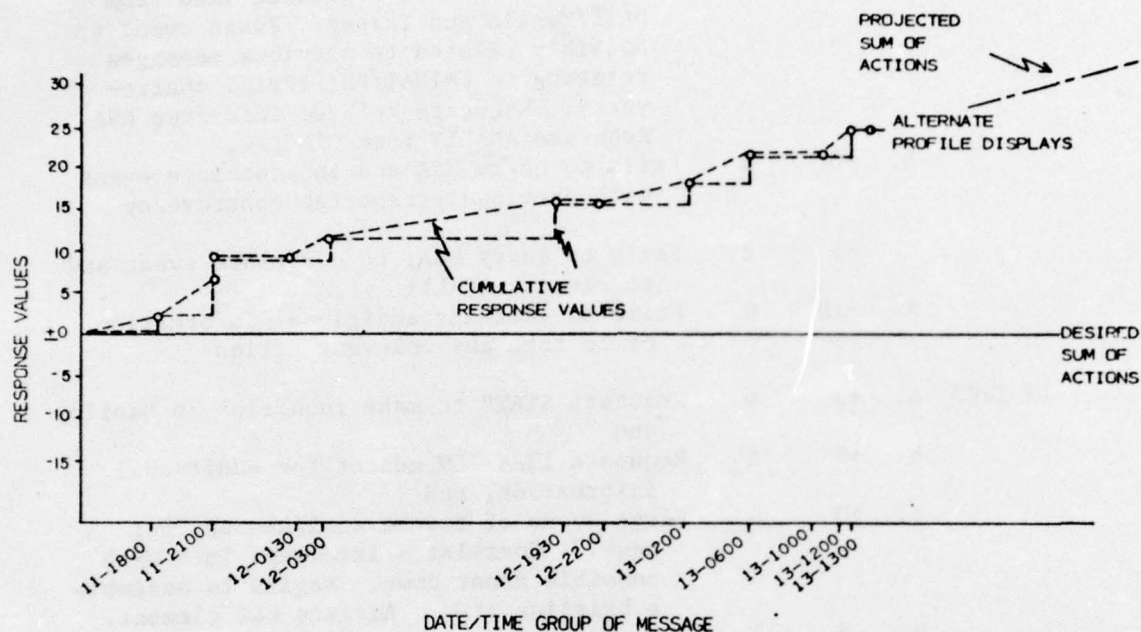


Figure IV-1. Exercise Activity Profile Using Weighted Response Arrays

Assuming for the moment that the arrays of response are valid, the actual exercise profile indicates that the exercise participants are "over-reacting" to the scenario as it is processed. If the Control Team is to maintain exercise activity levels at or near those desired, dampening inputs should be made, in this instance, no later than the 13-1200 time so that the exercise profile will parallel the "desired sum of actions." In this procedure for following the exercise, the actual profile would not, in all likelihood, return to the "desired sum of actions" level; only by taking deficit actions or underreactions for a prolonged period would it so return. Regardless of overreaction in the past, the desired level of exercise activity represented by a horizontal line would be sought.

A second method of computing relative exercise activity levels would be represented thusly (Figure IV-2):

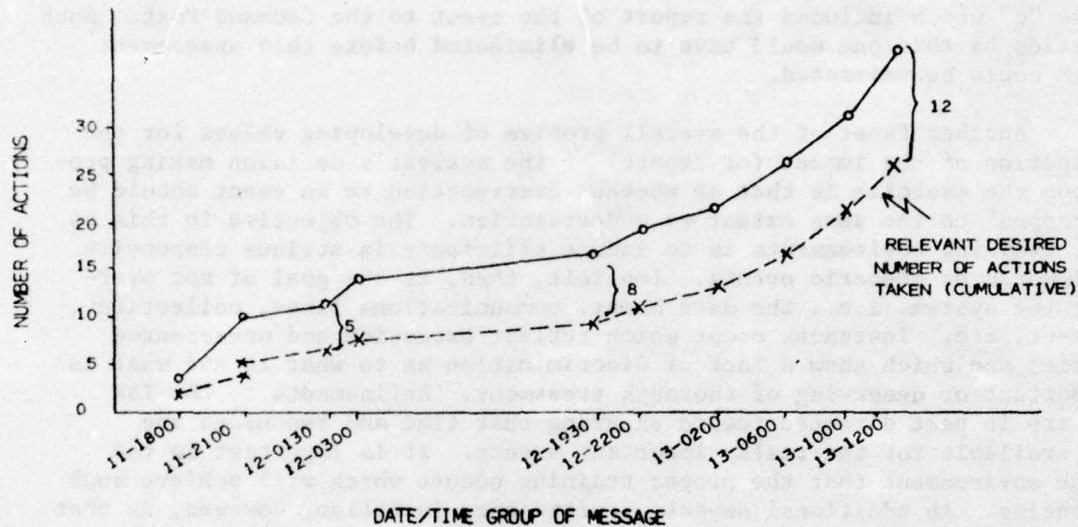


Figure IV-2. Exercise Activity Profile Using Relevant Actions Taken

RELEVANT ACTIONS TAKEN

11-1800	3		12-2200	2	-19
11-2100	5	-8	13-0200	3	-22
11-2100	2	-10	13-0600	5	-27
12-0130	2	-12	13-1000	5	-32
12-0300	2	-14	13-1200	6	-38
12-1930	3	-17			

In this example, the decisions made by the analyst are converted into discrete actions taken. The sum (cumulative) of "programmed actions" versus the actual actions taken are graphically compared. Similar projections may be made in this instance and corrective actions taken to cause the two progressions to parallel one another.

A significant problem arises in this second approach. Referring to the response array for 13-0600, it is apparent that the most significant action to be taken is informing the C&C element of the event. Should response "e" be made, a serious deficiency in appropriate actions taken would occur as indicated by the -6 value assigned in the first approach; but according to the count of actions taken, the weight would be (3) which is greater than for response "d" which includes the report of the event to the Command Post. Such ambiguities as this one would have to be eliminated before this assessment approach could be validated.

Another facet of the overall problem of developing values for the determination of the impact (or import) of the analyst's decision making process upon the exercise is that of whether overreaction to an event should be "handicapped" to the same extent as underreaction. The objective in this as in most training environments is to induce efficiency in actions responsive to real world or scenario events. Implicit, then, is the goal of not overdriving the system, i.e., the data bases, communications lines, collection management, etc. Instances occur which reflect excessive and unwarranted activities and which show a lack of discrimination as to what is and what is not important or deserving of thorough treatment. Refinements to the I&W system are in part directed toward ensuring that time and resources are always available for the really important events. It is important in the exercise environment that the proper training occurs which will achieve such efficiencies. An additional aspect of efficiency in action, however, is that of responding adequately to real world or exercise events. Ensuring adequate response would seem to occupy a priority position with respect to overreactions to event stimulation. Therefore, a review of the typical response arrays previously noted suggests that (+) values should be scaled down and the (-) value responses accentuated both in number and value. With such an adjustment, deficiencies in activity levels will become readily discernible and Control Team ad hoc injects will be stimulative rather than predominantly dampening.

For additional insight into the quantification of decision impact analysis, reference is made to the previous report, RADC TR-75-252, Section V.

C. THE COMPONENT ELEMENTS OF DECISION IMPACT ANALYSIS

Inputs to the equation for the evolvement of decision analysis which may be identified from the preceding message traffic and response arrays are several and of varied types. Each analytical assessment performed by the exercise participant, his decisions and products developed (e.g.,

briefing notes, memoranda, working file entries) along with Control Team Injects are among the dynamic inputs. Assessments may be largely predicated upon the

- o Scenario context in which the event occurs
- o Time structuring of the scenario
- o Availability of collateral information
- o Analyst's particular familiarity with or expertise regarding the event

The Control Team may be expected to respond to or interpret the results of the analytical assessment made with respect to its timeliness, relevance, and adequacy in developing a response value. As was previously noted in RADC TR-75-252, Section V, response handling will initially require Control Team intervention in relaying that value to the AIPERS Decision Analysis Module (ADAM). Such a requirement for human intervention will be necessary because:

- o The analyst's response must be matched against a predicted response array for each major event. Response patterns and procedures are not yet standardized sufficiently to permit matching by key words or phrases. The matching must be done by a Control Team member.
- o A response value is assigned to each predicted response. If the real response is substantially identical to one of those predicted, the value can be read and relayed to the ADAM for plotting. However, if the response is slightly different, or significantly different, the value will be decreased or increased - a Control Team member must assign it a value and relay the value to the ADAM.
- o Unpredicted responses cannot be matched as indicated above. Therefore, the required answers to these responses (request for collection, material, information, etc.) must be authored by the Control Team and fed to the Scenario Processor for entry into the exercise at an appropriate time.

D. SUMMARY

From the work conducted this far regarding the definition, deliniation and integration of decision impact analysis into exercise control procedures, the performance characteristic parameters may be established with

a reasonable degree of certainty. Decision analysis is a deliberate, contextually derived, attention demanding tool for use by an exercise Control Team in ensuring that the objectives of a particular exercise are met. Success in the effective employment of that tool is predicated upon the exhaustive identification of the total spectrum of possible analyst's or watch officer's responses. That spectrum is finite, being restricted by the resources available to the functional area undergoing exercise.

Figure IV-3 illustrates the flow of information within the exercise system relevant to the use of Decision Impact Analysis in the control function. The exercise tracker performs a key role in assisting the Control Team to employ decision analysis because it closes the loop with the analyst. The two components of the exercise message--the text with header information and the anticipated array of responses--are, in effect, split apart or uncoupled as the message enters the exercise arena. The text passes through the scenario processor while its related response array is passed to the ADAM. The latter module compares the weighted array with the specific response, and is then passed to ADAM by the tracker. The comparison effected is made available to the Control Team as is the Tracker output. Using the provided information, the Control Team maintains an exercise activity profile using one or both of the methodologies previously discussed. Using the profile as guidance, intervention into the exercise may be elected or the more subtle, essentially invisible, option of injecting an ad hoc message or messages into the scenario stream may be taken. The effects of Control Team participation may then be metered by the iterative process described above and adjustments to that participation may be made.

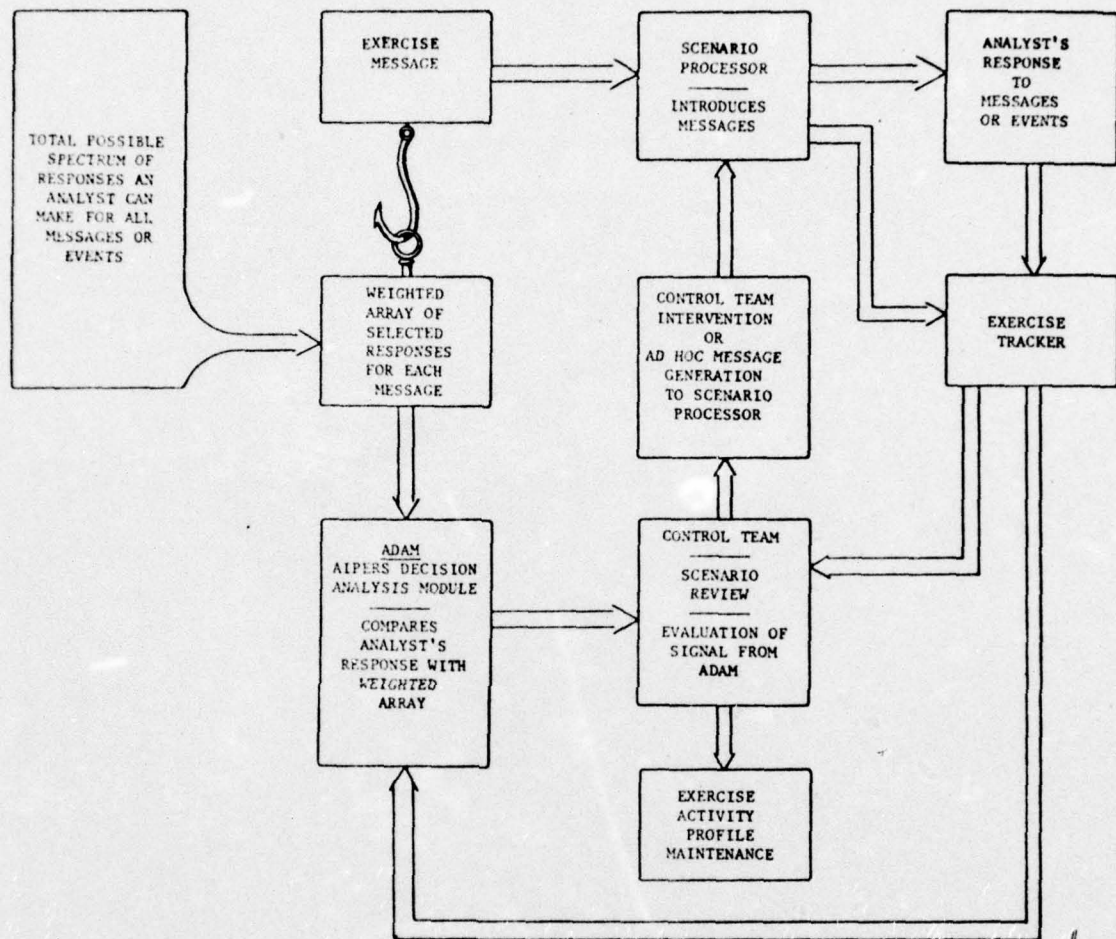


Figure IV-3. The Place of Decision Impact Analysis in AIPERS

CHAPTER V

DEMONSTRATION UTILITY PROTOTYPE
OF
AUTOMATED INTELLIGENCE PROCESSES
EXERCISE AND REVIEW SYSTEM
(AIPERS)

A USER'S MANUAL

10 JUNE 1976

CHAPTER V

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SECTION A

INTRODUCTION

1. PURPOSE AND REFERENCES

a. Background and Purpose

Under the direction of the Rome Air Development Center, the technical staff of INCO, INC., of McLean, Virginia has combined the transfer of advanced Terminal Oriented Support System (TOSS) technology with a selectively targeted R&D effort to produce an innovative automated system for exercise, evaluation and training. The system's evaluation capabilities will enable an indications and warning (I&W) or other functional manager to institute comprehensive check-out procedures to evaluate the adequacy and thoroughness of intelligence support facilities of analysts or watch-officers during simulated crisis conditions. A second major performance characteristic of the exercise system is its utility as a training medium both for the enhancement of analytical skills and for the development of personal proficiencies in operating the automated aids. The degree of automation presently occurring at major I&W centers has warranted the adoption of such a minimal cost exercise system to ensure that the expensive hardware and software support systems are performing efficiently.

The exercise system has been entitled the Automated Intelligence Processes Exercise and Review System or AIPERS. Design of system has progressed in such a way as to make it fully adaptable to other evaluation and training environments such as CPXs, command and control, and reconnaissance - intelligence interfaces.

The primary objectives of the effort to date have been to complete the R&D efforts attendant to automated scenario processing and to initiate those relevant to automated scenario generation, and to develop a Demonstration Utility Prototype (DUP) of AIPERS which will integrate the tracking and control functions previously developed with scenario processing. The latter objective will be used in conjunction with post-exercise evaluative methodologies and tools of measurement.

The purpose of this User's Manual is to provide functional analysts the information required to use the AIPERS Demonstration Utility Prototype (DUP) effectively. The manual includes a brief description of functions now available in the DUP repertoire, and the actions the analyst must perform to interact with the system to use them. Step-by-step procedures and sample CRT displays are shown to guide the analyst through the process of entering data the system needs to perform the functions he selects.

b. References

DUP program descriptions and installations procedures are contained in the following document:

- o AIPERS Interim Program Description,
11 March, 1976

Terminal Transparent Display Language (TTDL) Terminal operation and control features are contained in the following document:

- o TTDL Programmer's/User's Manual,
15 August, 1975 (Revision to be available
16 April, 1976)

Certain error codes which may appear are explained in the following documents:

- o TIMS Programmer's Manual
July, 1975 Revision 2
- o ISC Programmer's Manual
30 June, 1975 Phase 1, Revision 6

SECTION B
CONTROL TEAM TERMINAL FUNCTIONS

1. GENERAL

a. Introduction

The Exercise Control Team is provided various controls for the exercise on an as needed basis. These controls include stopping the exercise, restarting the exercise, reviewing the current scenario message, retrieving and reviewing any scenario message by message ID, adding ad hoc messages to the scenario, deleting messages from the scenario, and reordering scenario messages by modifying time tags.

b. Log On

The Log On procedure for the Exercise Control Team (ECT) is strictly a mechanical initialization function. Establishment of identity and security authorization are not required. Log On procedures are as follows:

- o Position cursor at command line
- o Type in RUN~~BECP~~[2 char screen name]. Hit CTRL A.

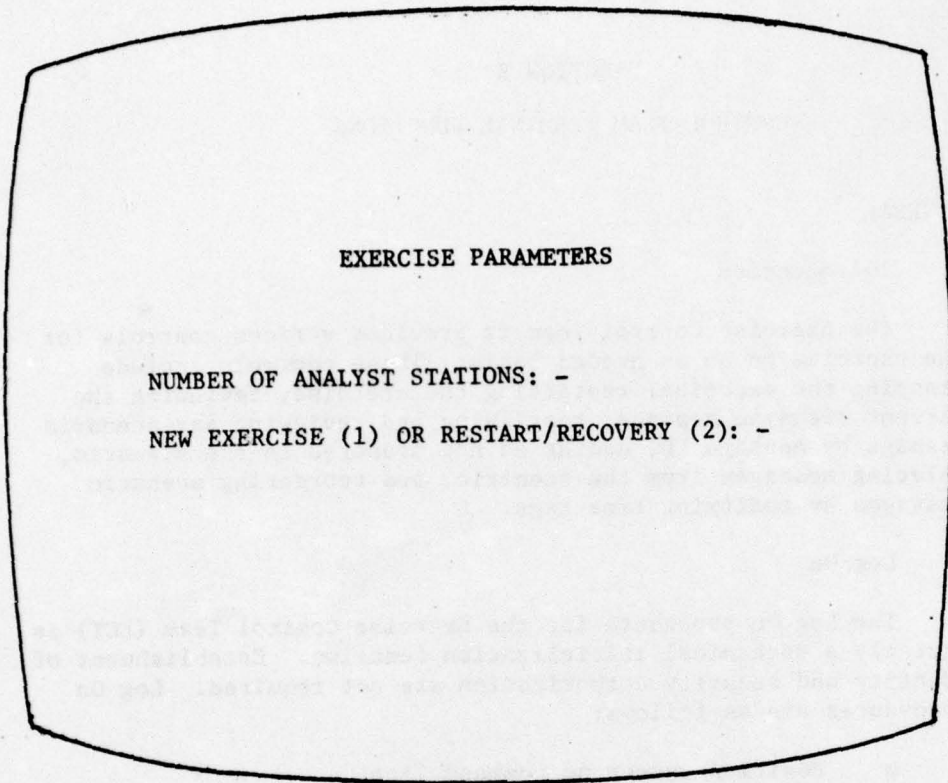
c. Exercise Initialization (Comes Up Automatically)

This will initialize the exercise so that other modules may be loaded. A screen is presented requesting exercise parameters, to wit:

- o Include the number of analyst stations
- o Indicate whether new exercise or restart recovery from a previous exercise.

This display is illustrated in Figure V-1.

The ENTER DATA key is depressed (throughout this document the term "ENTER DATA key" is used as a convention. Different terminal manufacturers use varying terminology, e.g., SEND PAGE, TRANSFER, etc. The corresponding Tektronix 4010 key is ALTMODE).



EXERCISE PARAMETERS

NUMBER OF ANALYST STATIONS: -

NEW EXERCISE (1) OR RESTART/RECOVERY (2): -

Figure V-1. Exercise Configuration Display

At this point, the exercise begins and the ECT assumes its function of controlling the exercise. The menu of control team functions is presented, as illustrated in Figure V-2.

To select any function, only the number to the left of the function must be entered. From this point on, exercise control consists of choosing a function, performing the function, and being returned to the function menu.

2. CONTROL FUNCTIONS

a. Function 1: Stop the Exercise

At any point in time, the demonstration may be stopped by entering "1", and the equivalent for the given terminal of ENTER DATA. Files are closed and the programs are terminated and unloaded. It should be noted that the depression of the ENTER DATA when no function has been selected will have the same effect.

CONTROL TEAM FUNCTIONS MENU

1. STOP THE EXERCISE
2. REVIEW THE CURRENT SCENARIO MESSAGE
3. REVIEW THE MESSAGE LOG
4. REVIEW ANY SCENARIO MESSAGE
5. ADD A NEW MESSAGE TO THE SCENARIO
6. DELETE A MESSAGE FROM THE SCENARIO
7. MODIFY A SCENARIO MESSAGE
8. CHANGE A SCENARIO MESSAGE TIME TAG

INPUT DATA: 5

IF YOUR CHOICE REQUIRES A PARAMETER, SPECIFY THE
MESSAGE ID HERE: AES-----

Figure V-2. Exercise Control Team Functions Menu Display

b. Function 2: Review the Current Scenario Message

This is the message which the Scenario Processor is currently displaying at the analyst stations. Selection of "2" enables the ECT to identify and review this message. If no message is currently being displayed, the ECT is so informed. Otherwise, the message, including header and text, is formatted for display; the time tag and current status bits of the message are also displayed.

In the example shown in Figure V-3, there is no current message. Figure V-4 illustrates the display of the current scenario message.



THERE IS CURRENTLY NO MESSAGE DISPLAYED AT THE ANALYST STATIONS.

Figure V-3. No Current Scenario Message Display

AES-020400

FM: ANYWHERE
TO: INCO, INC. INTEL. SIM. CTR.
RE: ANY SUBJECT
REF: WHICH REFERENCES IF ANY
DTG: 03 2043 MAR 76

THIS IS A SAMPLE MESSAGE. IT INCLUDES ONLY ONE TEXT
SECTION.

TIME TAG - 00:05:30

T2 PAGE 1 MORE FPG PGB PGF ENT

Figure V-4. Current Scenario Message Display

MESSAGE STATUS:

ALREADY SENT TO ANALYST(S)

ACTIVE

INITIAL SCENARIO MESSAGE

ORIGINAL TEXT

ORIGINAL TIME TAG

T2 PAGE 2 END FPG PGB PGF ENT

Figure V-4. Current Scenario Message Display (Continued)

73

c. Function 3: Review the Message Log

The Message Log is a file of 74 character records generated by the Scenario Processor. Each record consists of the Message ID and the "RE" header line from the message. When reviewing the Message Log, the function builds a list of each message that has been sent to the analyst station plus the "RE" line. In the example shown in Figure V-5, there are no messages in the log. Figure V-6 illustrates the display created after six messages have been processed by the Scenario Processor.

d. Function 4: Review any Scenario Message

This function requires the entry of the six character message ID parameter as well as the function number ("4"). This ID identifies the specific message to be reviewed. The entire message including header, text, time tag, and status is displayed. This is identical to Function 2, except that a specific message is identified. A sample message for review is illustrated in Figure V-7.

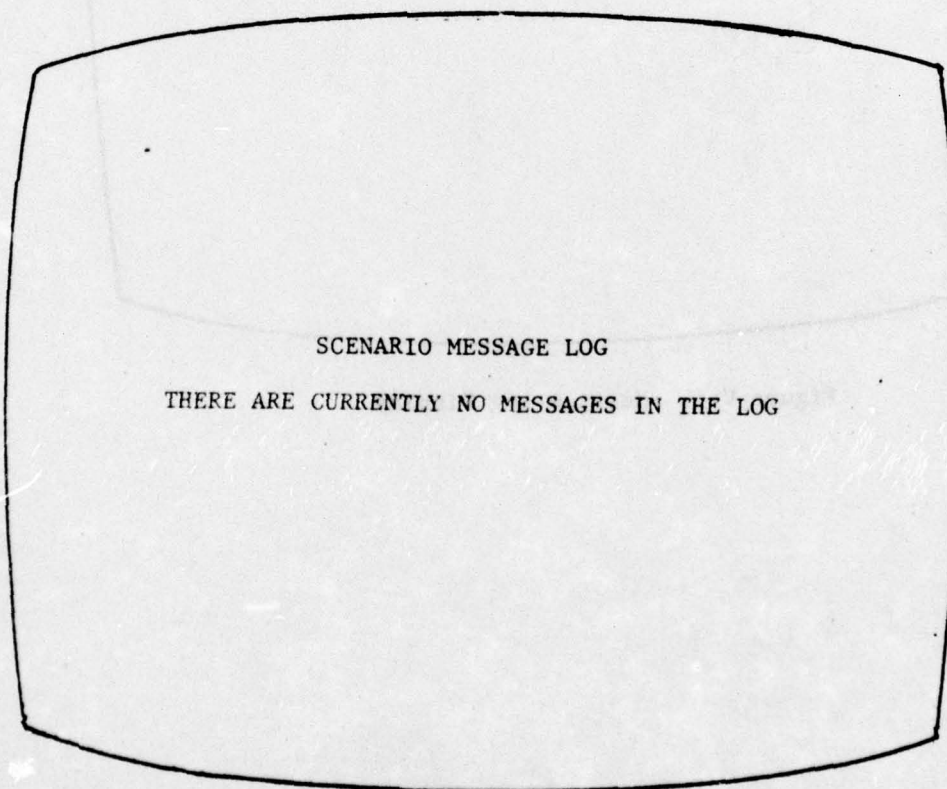


Figure V-5. Empty Message Log Display

SCENARIO MESSAGE LOG

AES-040600 RUSSIAN INVASION OF N. IRELAND

AES-010701 N. IRELAND ATTACK OF POLAND

AES-000300 ENGLAND LEAVING NATO

Figure V-6. Message Log Display

AES-010000

FM: ANYWHERE
TO: INCO, INC. INTEL. SIM. CTR.
RE: ANY SUBJECT
REF: WHICH REFERENCES, IF ANY
DTG: 03 2130 MAR 76

THIS IS THE TEXT OF THE MESSAGE. THIS IS THE NEW LINE. ALL
EXTRANEIOUS INPUT FIELD CHARACTERS WILL BE REMOVED FROM THE
TEXT BY THE EDITOR.

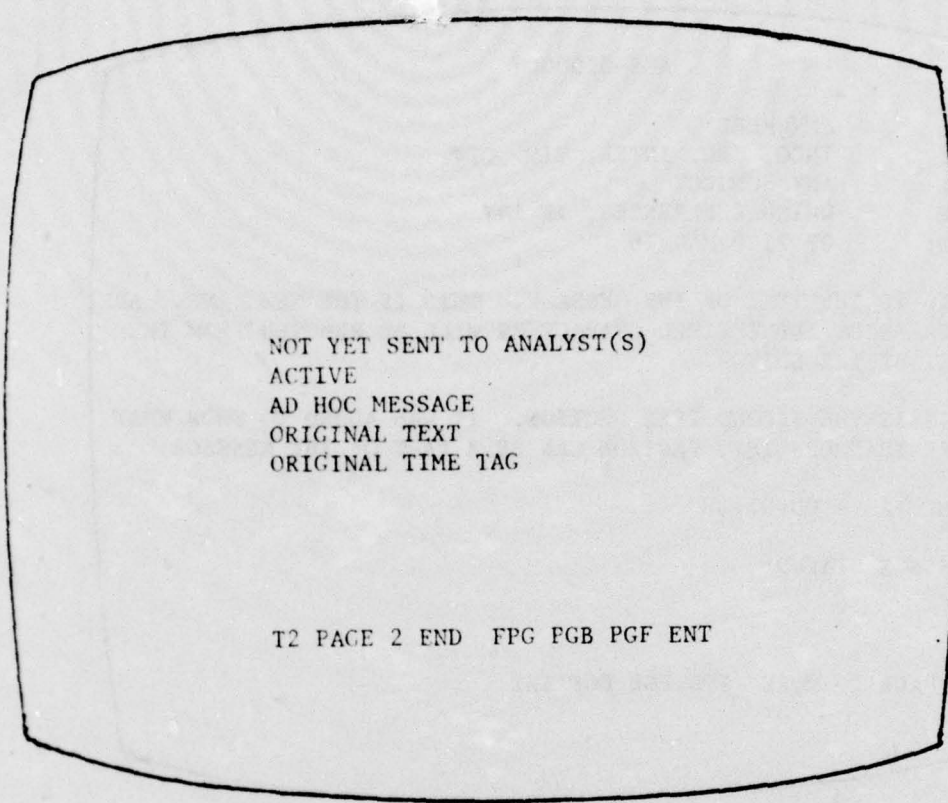
THIS IS THE SECOND TEXT SECTION. IT WAS ADDED TO SHOW WHAT
MORE THAN ONE TEXT SECTION CAN BE A PART OF THE MESSAGE

TIME TAG - 00:01:00

MESSAGE STATUS:

T2 PAGE 1 MORE FPG PGB PGF ENT

Figure V-7. Review Scenario Message Display



NOT YET SENT TO ANALYST(S)
ACTIVE
AD HOC MESSAGE
ORIGINAL TEXT
ORIGINAL TIME TAG

T2 PAGE 2 END FPG PGB PGF ENT

Figure V-7. Review Scenario Message Display (Continued)

e. **Function 5: Add a New Message to the Scenario**

When this function is selected, the first thing to appear on the screen is the Message Editor Functions menu (see Section D of this chapter). The Message Editor will be waiting for input in the form of both header and text. The editor then builds, reviews, and edits the new message. Control is passed back to "a new message" function, which determines if the message is complete. If not, an error screen is displayed. A "Time Tag Entry" screen is then displayed. A time tag in hours/minutes/seconds from the start of the exercise is requested. This display is illustrated in Figure V-8.

This time tag is compared to the current message time tag. If the new message time tag has expired (i.e., is less than the current message time tag), the ECT is requested to reenter a valid tag. Should the ECT not be able to come up with a tag which the program considers valid (a "loop" situation develops), an invalid character in the time tag field will cause return to the Control Function menu.

When a valid time tag is accepted, the message ID is assigned, the message is added to the Message Library, and the time tag is added to the Message Time List (MTL) file. **Note** that a time tag may not be equal to one already in the MTL file.

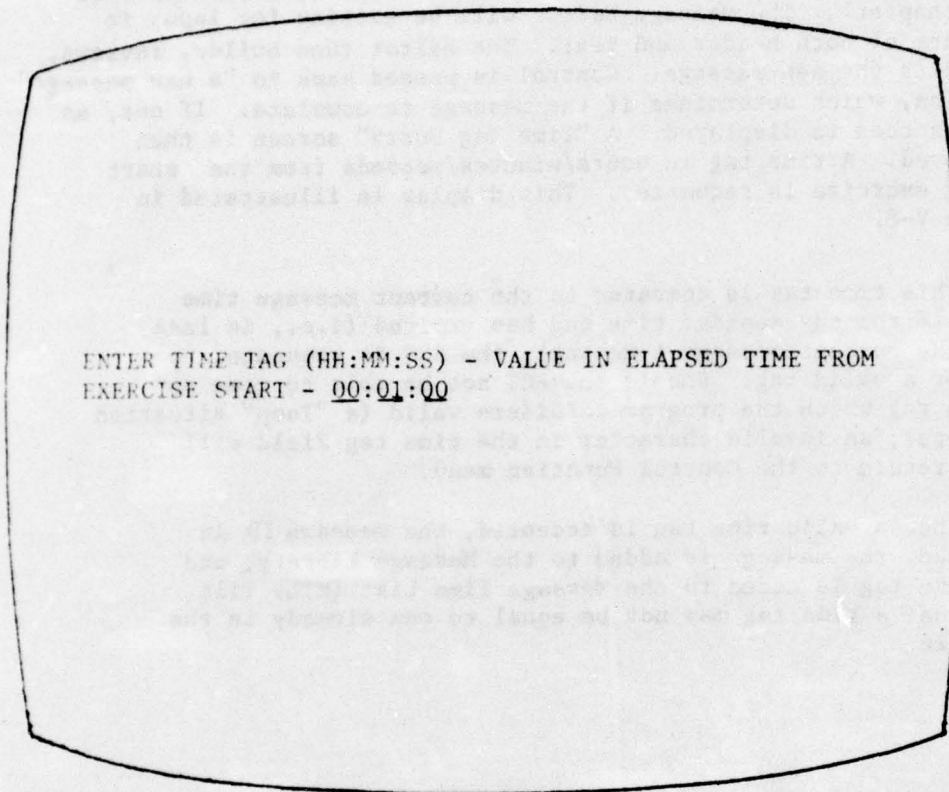
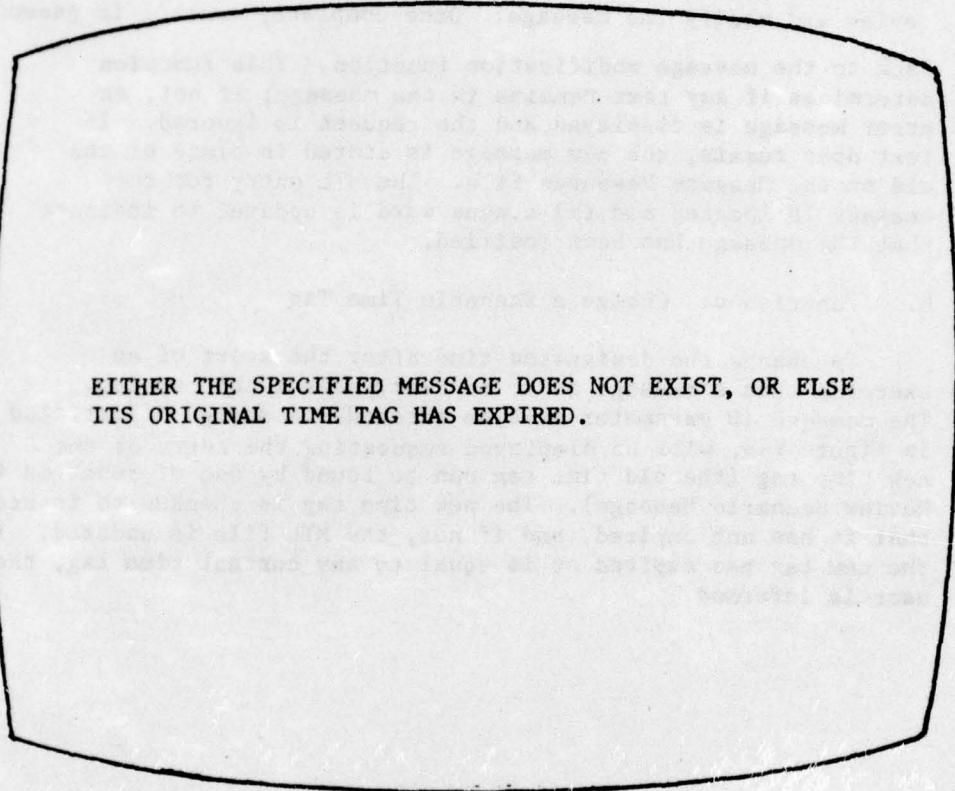


Figure V-8. Enter Time Tag Display

f. Function 6: Delete a Message from the Scenario

This function requires the entry of the Message ID parameter as well as the function number. The function scans the MTL and, if it finds such an ID, marks it deleted without actually removing the entry. A status bit is set to indicate that the message was deleted. If the message ID is not found, an error message appears on the screen. Otherwise, the Control Team functions menu is returned to the Screen. The error display is illustrated in Figure V-9.



EITHER THE SPECIFIED MESSAGE DOES NOT EXIST, OR ELSE
ITS ORIGINAL TIME TAG HAS EXPIRED.

Figure V-9. Delete Scenario Message Error Display

g. Function 7: Modify a Scenario Message

This function requires the entry of the ID of the message to be modified. The message is retrieved if possible, from the Message Resource File. An error screen is returned if the message cannot be found. If found, the text will be accessed and formatted properly for the Message Editor (see Section D of this chapter). Control is passed to the Message Editor, which allows the ECT to review and modify the message. Once complete, control is passed

back to the message modification function. This function determines if any text remains in the message; if not, an error message is displayed and the request is ignored. If text does remain, the new message is stored in place of the old on the Message Resource File. The MTL entry for the message is located and the status word is updated to indicate that the message has been modified.

h. Function 8: Change a Scenario Time Tag

To change the designated time after the start of an exercise that a message is to be sent, select this option. The message ID parameter must be entered. A screen illustrated in Figure V-8, will be displayed requesting the entry of the new time tag (the old time tag can be found by use of Function 4: Review Scenario Message). The new time tag is checked to insure that it has not expired, and if not, the MTL file is updated. If the new tag has expired or is equal to any current time tag, the user is informed.

SECTION C

ANALYST STATION FUNCTIONS

1. GENERAL

a. Introduction

This section describes the functions which may be employed by the analyst at his exercise work station. The analyst work station in the DUP consists of a CRT terminal. The CRT is broken into two screens. The upper half of the screen is reserved for the display of the current scenario message. The lower half of the screen is devoted to typical analyst functions such as current message acknowledgement and accessing of various resources such as data bases. The format of the analyst work station terminal screen is illustrated in Figure V-10. Manipulation of the terminal between the two screen areas as well as paging displays is discussed in Section E.

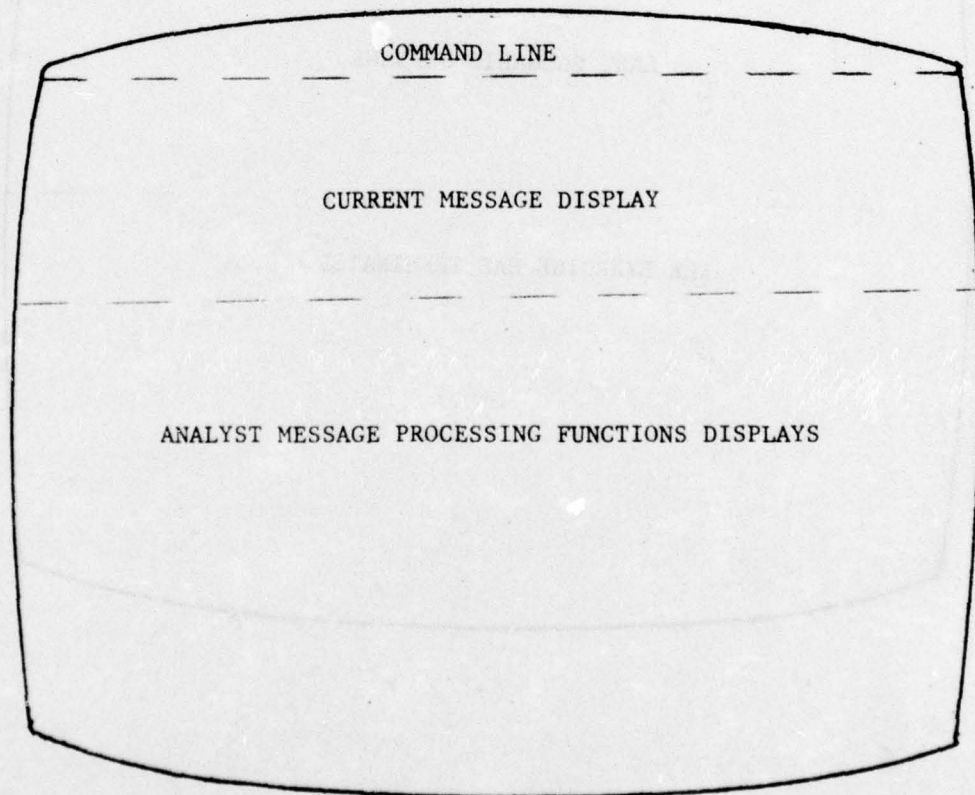


Figure V-10. DUP Analyst Work Station Screen Format

b. Access

Access to the two portions of the DUP analyst work station screen is gratuitous; that is, no log on sequence is required. The top screen area may be accessed immediately upon forwarding of the first scenario message by the scenario processor. The lower portion of the screen is accessible upon forwarding of the analyst functions selection menu. All access to both screen areas is terminated once the exercise termination message is transmitted to the lower screen area. This is illustrated in Figure V-11.

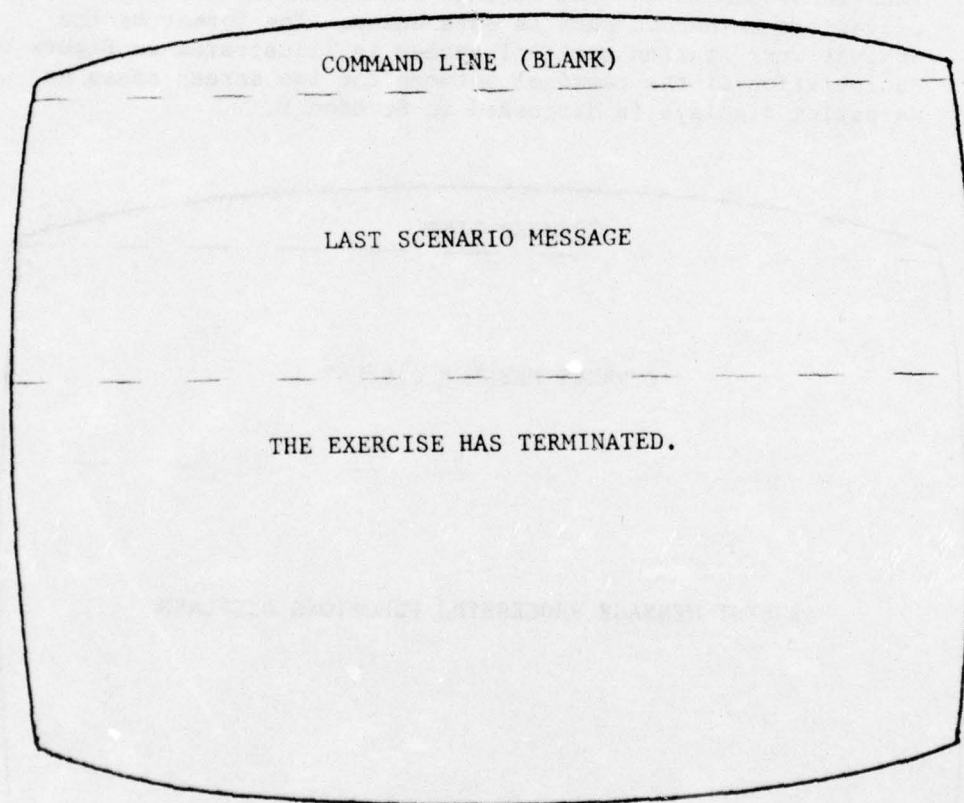


Figure V-11. Analyst Work Station Exercise Termination Display

2. ANALYST MESSAGE REVIEW FUNCTION

All scenario messages are forwarded to the analyst work station by predetermined time tag. Each message is formatted into a display and transmitted to the upper half of the analyst terminal screen. Each time a new message is transmitted, it replaces the previous message in the display area. A sample message in the analyst station message display area is illustrated in Figure V-12. Once the message has been written to the top screen area, it is available for review by the participating analyst. If the message consists of multiple pages, it can be paged forward and backward using the terminal paging function keys (see Section E).

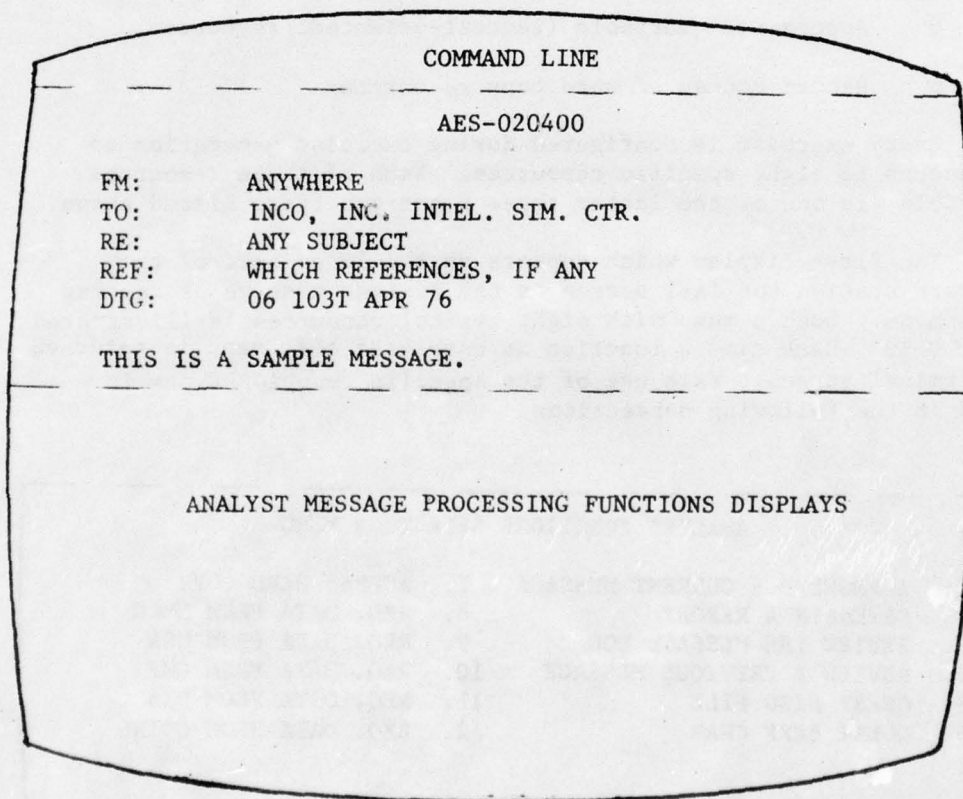


Figure V-12. Sample Scenario Message Display

3. ANALYST MESSAGE PROCESSING FUNCTIONS

A variety of message processing functions are available for use by the participating analyst through the lower half of the work station terminal screen. These functions include:

- o Acknowledge the current message
- o Generate a report
- o Review the message log
- o Review a previous message
- o Access queryable resources
- o Access non-queryable (request-oriented) resources
- o Record access of hard copy resources

Every exercise is configured during exercise generation to provide access to eight specific resources. Each of these resources is accessible via one of the latter three functions types listed above.

The first display which appears on the lower half of the analyst work station terminal screen is the analyst message processing functions menu. Such a menu with eight typical resources is illustrated in Figure V-13. Each time a function is completed this menu is returned to the terminal screen. Each use of the specific function types is described in the following subsections.

ANALYST FUNCTIONS SELECTION MENU

1. ACKNOWLEDGE CURRENT MESSAGE	7. ACCESS HARD COPY
2. GENERATE A REPORT	8. REQ. DATA FROM NMCC
3. REVIEW THE MESSAGE LOG	9. REQ. DATA FROM NSA
4. REVIEW A PREVIOUS MESSAGE	10. REQ. DATA FROM CMF
5. QUERY BIOG FILE	11. REQ. DATA FROM DIA
6. QUERY PERF CHAR	12. REQ. DATA FROM COINS

INPUT DATA:---

Figure V-13. Analyst Message Processing Functions Menu Display

a. Acknowledge the Current Message

This function allows the analyst to acknowledge that he has read the message in the current message display of his work station (the top half of the terminal screen). To acknowledge the current message, the analyst enters "1" in the "INPUT DATA" area followed by the equivalent for the given terminal of ENTER DATA. When this function is selected, the analyst is informed that the current message has been acknowledged by the display illustrated in Figure V-14. Once ENTER DATA is struck, the Analyst Functions Menu is returned to the lower half of the terminal screen.

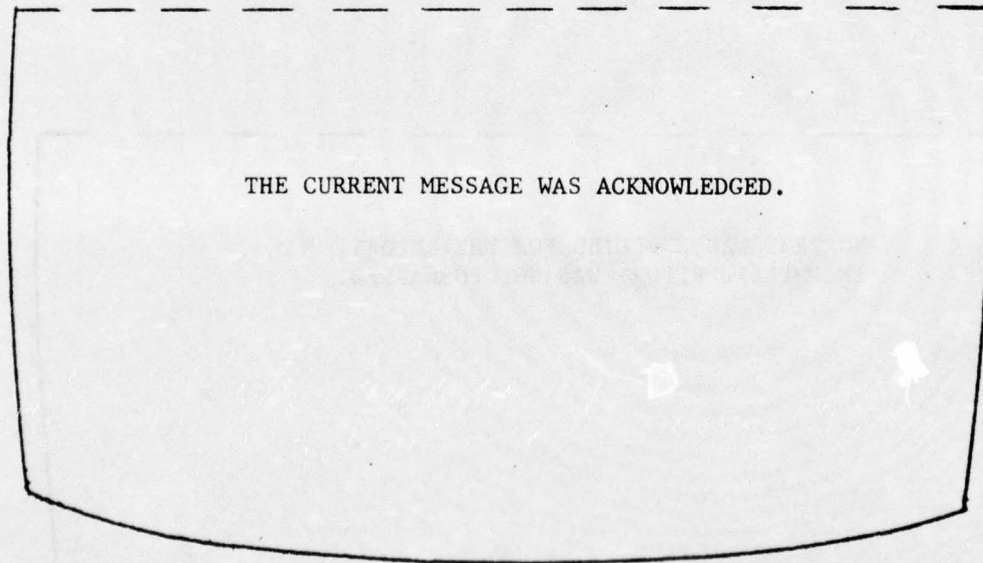
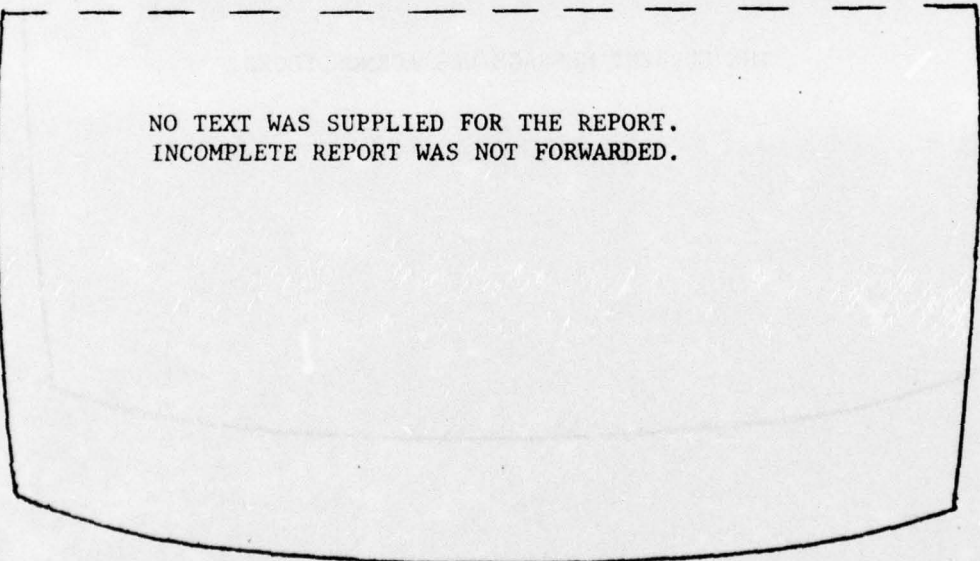


Figure V-14. Current Message Acknowledgement Display

b. Generate a Report

This function is selected by entering a "2" into the Analyst Functions Menu input field followed by ENTER DATA. It allows the analyst to build a report in the form of a message and transmit it to the appropriate authorities. When this function is selected, the first thing to appear on the screen is the Message Editor Functions menu (see Section D of this chapter). The Message Editor will accept input in the form of both header and text; and will allow the message/report to be built, reviewed, and edited as necessary until it is ready for forwarding. Control is returned from the Message Editor to the "Generate a Report" function, which determines whether the report contains any text. If no text is present, an error message (illustrated in Figure V-15) is transmitted to the screen and the reporting function is terminated. Otherwise, the message/report is forwarded, the analyst is informed of this action (see Figure V-16), and control is returned to the functions menu.



NO TEXT WAS SUPPLIED FOR THE REPORT.
INCOMPLETE REPORT WAS NOT FORWARDED.

Figure V-15. Incomplete Report Error Display

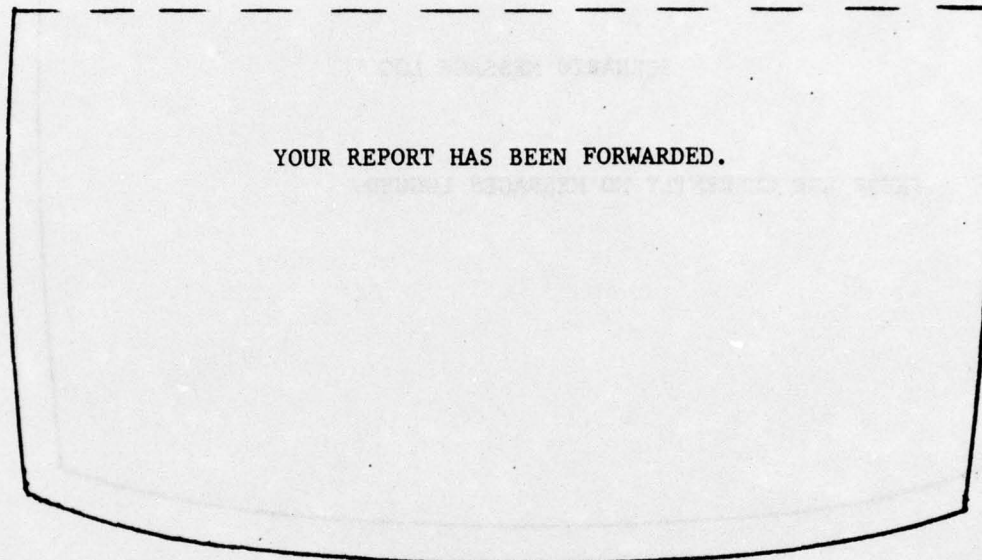


Figure V-16. Completed Report Forwarding Display

c. Review the Message Log

The Message Log is a file, generated by the Scenario Processor, which contains an entry for each scenario message which has already been transmitted to the analyst station. Each entry in this Log consists of the Message ID (e.g., AES-020471) followed by the message header "RE" line. The analyst function to review the Message Log is selected by entering "3" in the Analyst Functions menu followed by ENTER DATA. Figure V-17 illustrates the display which is returned if no entries have yet been made in the Log. Figure V-18 illustrates a typical display generated from a log with several message entries.

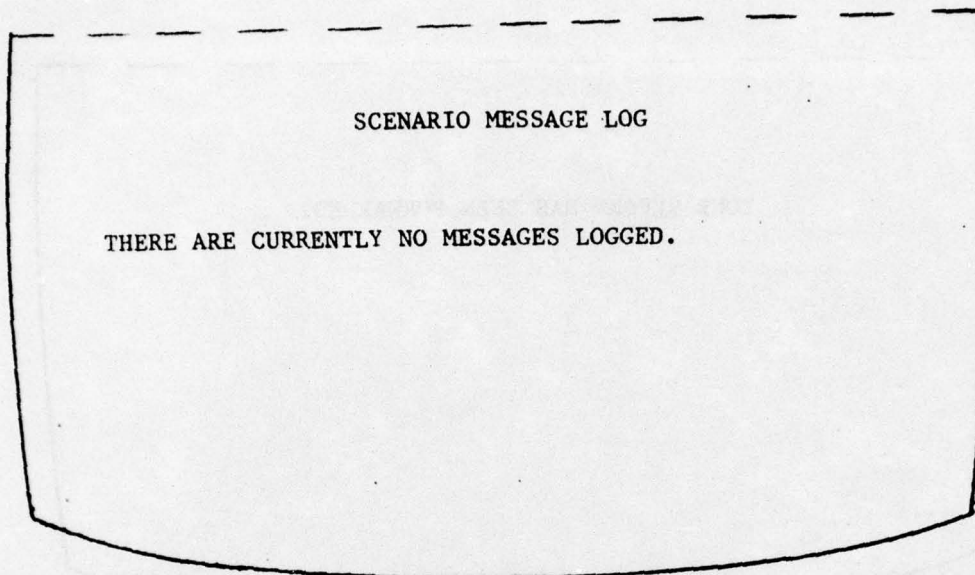


Figure V-17. Empty Message Log Display

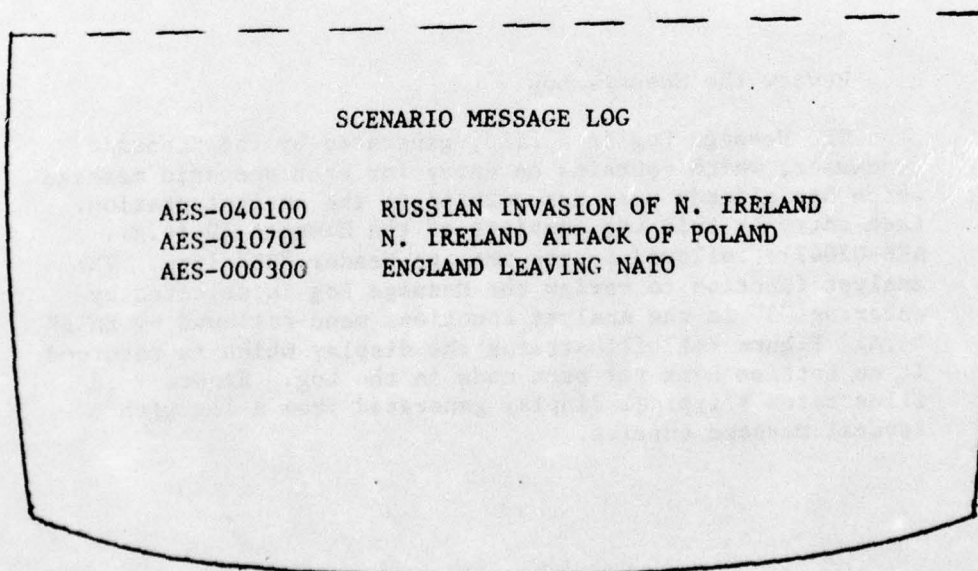


Figure V-18. Message Log Display

d. Review a Previous Message

This function allows the analyst to recall a previously displayed scenario message for review on the lower half of his terminal screen. The function is initiated by entering a "4" into the input field of the Analyst Functions menu followed by ENTER DATA. Once initiated, the function requests the message ID of the message to be reviewed. The display which requests the message ID is illustrated in Figure V-19. After acquiring the message ID, the requested message is formatted and displayed on the lower half of the terminal screen illustrated in Figure V-20. If an invalid message ID is supplied, then an error message, illustrated in Figure V-21, is returned.

MESSAGE ID OF MESSAGE TO BE REVIEWED:

AES-_____

The image shows a terminal screen with a dashed border. Inside, there is a text prompt "MESSAGE ID OF MESSAGE TO BE REVIEWED:" followed by a line of text "AES-_____".

Figure V-19. Message ID Request Display

AES-010000

FM: ANYWHERE
TO: INCO, INC. INTEL. SIM. CTR.
RE: ANY SUBJECT
REF: REFERENCES, IF ANY
DTG: 02 1745 MAY 76

THIS IS A SAMPLE MESSAGE.

Figure V-20. Message Review Display

AES-Q3Z2P1

THE ABOVE MESSAGE DOES NOT EXIT.

Figure V-21. Message Review Error Display

e. Query a Data File

The query function is used to access queryable resources such as data files. For example, to query a file of biographic information using the functions menu in Figure V-13, the analyst enters "5" in the "INPUT DATA" area of the functions menu display followed by ENTER DATA. Once this is accomplished, a display containing the name of the resource, an input field for the ID of the message which prompted the query, and an input field for the actual data request is sent to the analyst station terminal screen. Such a display is illustrated in Figure V-22. Once this display is sent to the terminal screen, the analyst must enter both the pertinent message ID and text indicating the type of information he is seeking, followed by ENTER DATA. Then, based upon the message ID, the resource is searched for an appropriate reply to the query. If no query was anticipated to the chosen file prompted by the specified message, then the analyst terminal screen receives a display stating that no data are available. Otherwise, if a query reply is found, the reply is formatted and transmitted to the terminal screen. Once ENTER DATA is struck following the display of either of these screens, the function is terminated, and the analyst functions menu is returned to the screen.

QUERY BIOG FILE

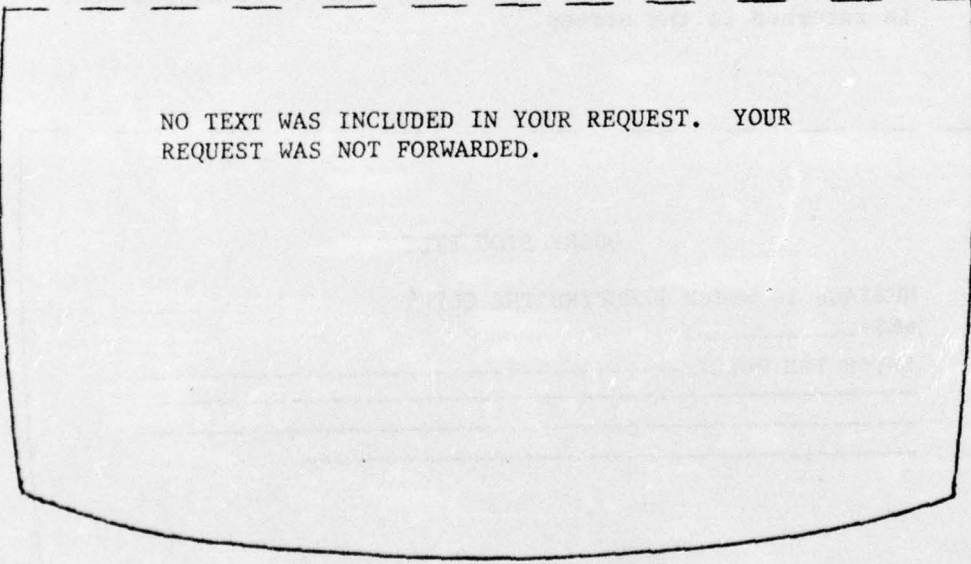
MESSAGE ID WHICH PROMPTED THE QUERY:
AES-----

ENTER THE QUERY:-----

Figure V-22. Sample Data File Query Display

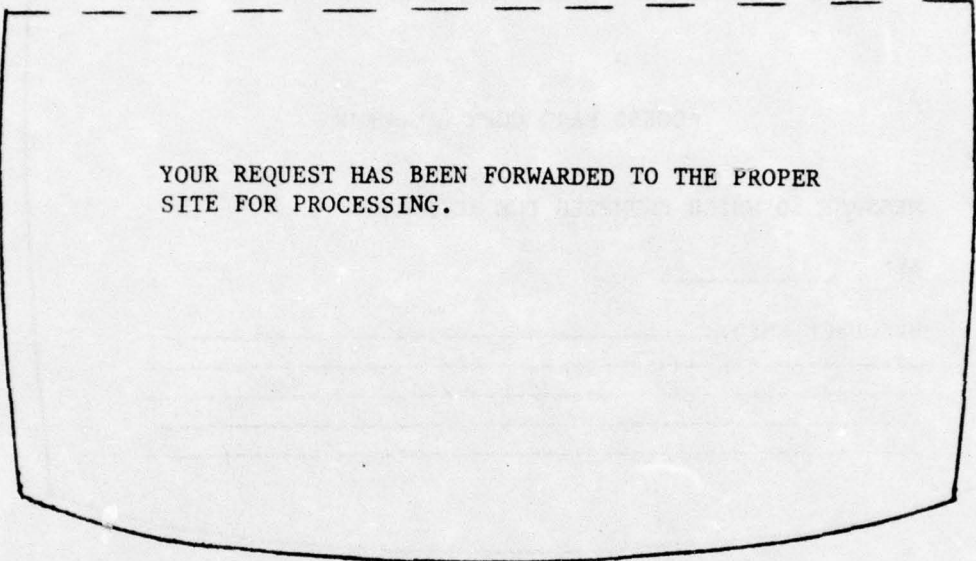
f. Request Data from a Resource

The request data function is used to access resources which are not queryable (as a data file is queryable). Such resources include agencies, commands, collection facilities, etc. For example, to request data from the Collection Management Facility (CMF) using the functions menu illustrated in Figure V-13, the analyst would enter "10" into the "INPUT DATA" field followed by ENTER DATA. Once a request function is activated, control is passed to the Message Editor for the purpose of formatting a message containing the specific request. (see Section D for instructions on the use of the editor.) When control is returned to the request function from the editor, the message is examined. If the message contains no text then an error display is sent to the terminal (see Figure V-23) and the function is terminated. Otherwise, the message is transmitted, and the analyst station is notified (see Figure V-24).



NO TEXT WAS INCLUDED IN YOUR REQUEST. YOUR
REQUEST WAS NOT FORWARDED.

Figure V-23. Data Request Error Display



YOUR REQUEST HAS BEEN FORWARDED TO THE PROPER
SITE FOR PROCESSING.

Figure V-24. Data Request Termination Display

g. Log Hard Copy References

This function logs "hard copy" (non-automated) references made by the analyst during the exercise. Using the functions menu illustrated in Figure V-13, the analyst would activate this function by entering "7" into the "INPUT DATA" field followed by ENTER DATA. A display is returned to the terminal screen which requests the ID of the message which prompted the hard copy reference, and the reference material(s) used. This display is illustrated in Figure V-25. Once the analyst fills in the two input fields and strikes ENTER DATA, the message "HARD COPY RESOURCE RECORDED" is sent to the terminal screen.

ACCESS HARD COPY RESOURCE

MESSAGE ID WHICH PROMPTED THE ACCESS:

AES- _____

RESOURCE USED: _____

Figure V-25. Hard Copy Resource Log Display

SECTION D

ON-LINE MESSAGE EDITOR FUNCTIONS

1. GENERAL

a. Introduction

The On-Line Message Editor is capable of modifying the header and text of existing messages as well as constructing and editing new messages entered from an on-line terminal. The editor is modularly structured so that the editing functions required for each different application can be serviced without extensive modification to the basic editor. The Message Editor assumes that all messages consist of a five line header and one or more sections of text.

b. Access

The Message Editor is called when required by one of the DUP Functions, and when called, displays a selection menu of Message Editor Functions as shown in Figure V-26.

MESSAGE EDITOR

SELECT AN EDITING OPTION:

1. ENTER/REVIEW THE MESSAGE HEADER	2. REVIEW THE CURRENT MESSAGE TEXT
3. ADD A TEXT SECTION	4. ADD A LINE TO A SECTION
5. DELETE A TEXT SECTION	6. DELETE A LINE FROM A SECTION
7. REPLACE A TEXT SECTION	8. REPLACE A LINE WITHIN A SECTION
9. TERMINATE MESSAGE EDITING	

INPUT DATA: 1__

Figure V-26. Editor Functions Menu

Upon completion the Message Editor returns control to the function which called it.

2. EDITOR FUNCTIONS

a. Function 1: Enter/Review the Message Header

A message header consists of five lines: a "from" line, a "to" line, a "re" line, a reference line, and a date/time group line. When this function is selected, a display is built containing the header of the current message. The "from" line may contain up to 72 Characters. The "to" line may contain up to 60 characters. The "re" and reference lines may also have up to 60 characters, and the date/time group line has 14 characters which may be set up as follows:

DAY TIME MONTH YEAR
DDTTTMMYY

This syntax is not checked however.

The header may now be altered as desired. Depression of the ENTER DATA key will cause the altered header to be stored and the Message Editor selection menu will be re-displayed. Figure V-27 illustrates a sample header display.

REVIEW AND/OR MODIFY HEADER FIELD CONTENTS

FM: ANYWHERE

TO: INCO, INC. INTEL. SIM. CTR.

RE: ANY SUBJECT

REF: WHICH REFERENCES, IF ANY

DTG: 03 2130 MAR 76

Figure V-27. Message Header Entry/Modification Display

AD-A031 742

INCO INC MCLEAN VA

F/G 9/2

AUTOMATED INTELLIGENCE PROCESSES EXERCISE AND REVIEW SYSTEM (AI--ETC(U)

AUG 76 L A BURCHAM, M MILLS, D J DAVIS

F30602-75-C-0283

UNCLASSIFIED

1048-A002

RADC-TR-76-251

NL

2 OF 2

AD
A031742



END

DATE

FILMED

12-76

b. Function 2: Review the Current Message Text

This is the counterpart of the Review Message Header Function, except that no alteration of message text can occur. This function rennumbers the text sections (in the case of a multi-part message) beginning with 10 and thereafter in increments of 10. Each text section is displayed along with the section number as the user pages through the message by use of the appropriate function key. The ENTER DATA key returns the user to the selection menu. Figures V-28 and V-29 illustrate examples of two possible responses to the selection of this function.

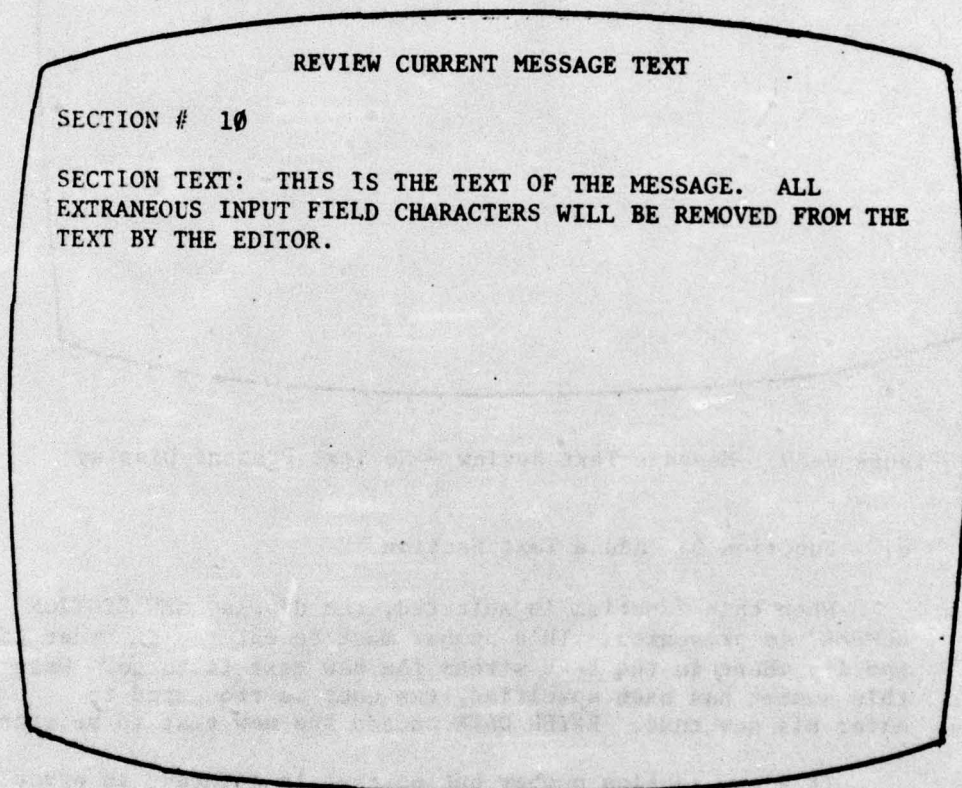


Figure V-28. Message Text Review Display

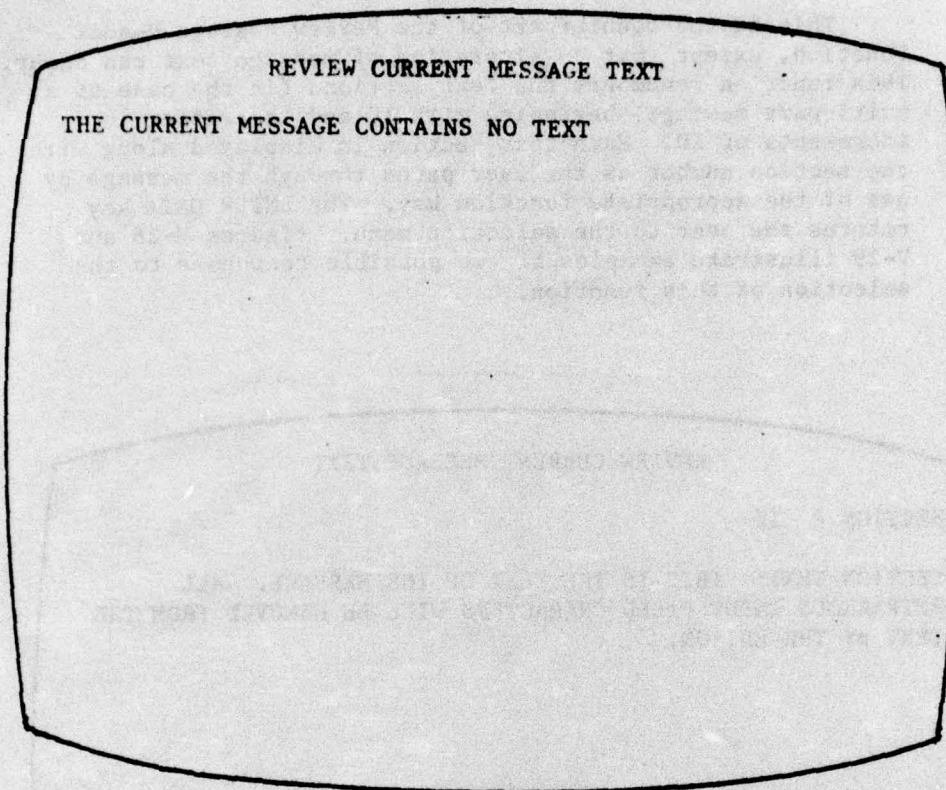


Figure V-29. Message Text Review - No Text Present Display

c. Function 3: Add a Text Section

When this function is selected, the display NEW SECTION NUMBER? is presented. This number must be entered in order to specify where in the text stream the new text is to go. When this number has been specified, the user is requested to enter his new text. ENTER DATA causes the new text to be stored.

If a new section number but no text is entered, an error screen will be displayed. Likewise, text with no section number will generate an error message. If a message, through text addition, grows too big (i.e., exceeds program buffer space), an error message to this effect will be displayed, and the new text will be ignored.

The two samples illustrated on Figure V-30 partially illustrate the operation of this function:

ADD A SECTION OF TEXT TO THE MESSAGE

NEW SECTION #: 10

NEW TEXT:

T2 PAGE 1 MORE FPG PGB PGF ENT

THIS IS THE TEXT OF THE MESSAGE ALL EXTRANEIOUS INPUT FIELD
CHARACTERS WILL BE REMOVED FROM THE TEXT BY THE EDITOR

T2 PAGE 2 MORE FPG PGB PGF ENT

Figure V-30. Add a Text Section Displays

d. Function 4: Add a Line to a Section

This function will request the Control Team user to input:

- o The 80 character (or fewer) line to be added
- o The number of the section to which the line is to be added
- o The 80 characters (or a sufficient number to identify the line) following which the new line is to be added. If this field is left blank, the new line will be inserted at the beginning of the section.

The character string "/END/" entered in the "FOLLOWING THE LINE" input field will cause the new line to be placed at the end of the section.

A missing or illegal section number will generate an error message, as will a text line for the new line to follow which does not exist. If the message has grown too big, the user is informed and the new line is ignored. A display associated with this function is illustrated in Figure V-31.

ADD A LINE TO A TEXT SECTION

ADD THE LINE: THIS IS THE NEW LINE

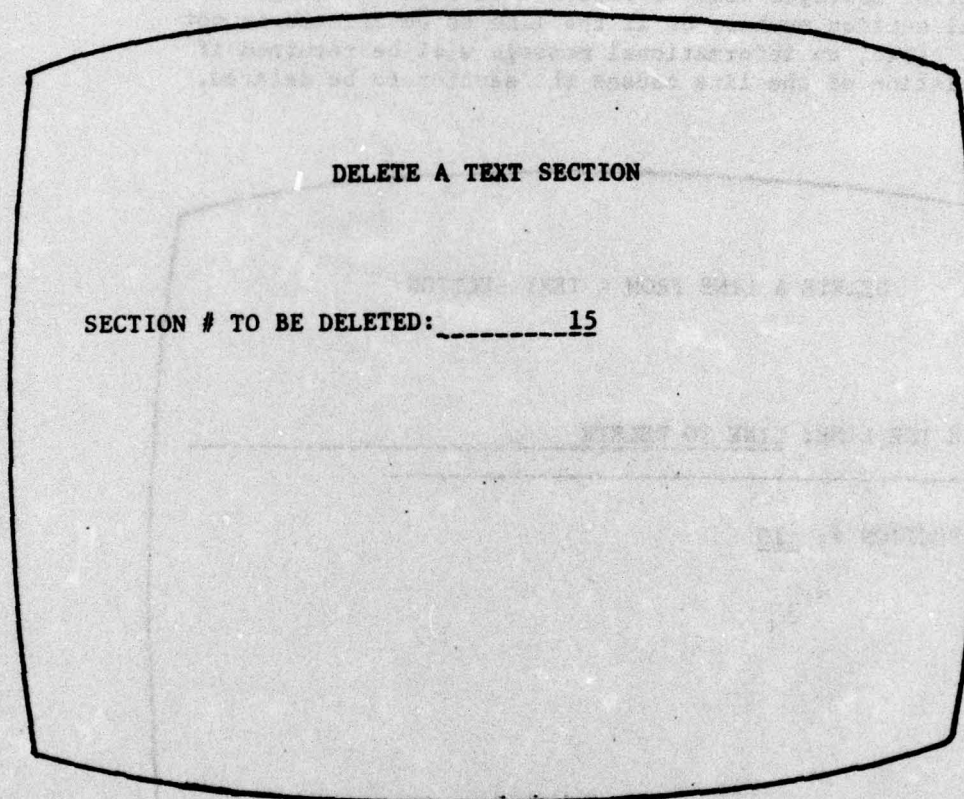
FOLLOWING THE LINE: MESSAGE

IN SECTION #: 10

Figure V-31. Sample Add a Line Display

e. Function 5: Delete a Text Section

When this function is specified, a display appears requesting the section number to be deleted. This display is illustrated in Figure V-32. When this number is entered and ENTER DATA is pressed, the section is deleted and the selection menu is returned. A non-existent section number causes an error message.



DELETE A TEXT SECTION

SECTION # TO BE DELETED: _____15

Figure V-32. Delete a Text Section Display

f. Function 6: Delete a Line from a Section

This function will request the input of up to 80 characters of the line to be deleted and a section number. The Delete a Line display is illustrated in Figure V-33. When these are entered and ENTER DATA keyed, the line will be located and deleted and the selection menu will be returned. Note that only the first occurrence of the specified line will be deleted.

Error messages will be returned in case of illegal text, an illegal section number, or if the line to be deleted is not found. Also, an informational message will be returned if the deletion of the line causes the section to be deleted.

DELETE A LINE FROM A TEXT SECTION

DELETE THE LINE: LINE TO DELETE

FROM SECTION #: 10

Figure V-33. Delete a Line From a Section Display

g. Function 7: Replace a Text Section

Upon selection of this function, the user will be requested to enter the section number of the section to be replaced, and, on the next page, the replacement text. (see Figure V-34.) Error messages will be generated if the section number is illegal; if no text is entered; or if the message, through this replacement, would become too large.

REPLACE A SECTION OF TEXT WITHIN THE MESSAGE

REPLACED SECTION #: 12

NEW TEXT:

T2 PAGE 1 MORE FPG PCB PGF ENT

Figure V-34. Text Section Replacement Displays

THIS IS THE REPLACEMENT TEXT FOR SECTION 12.

T2 PAGE 2 MORE FPG PGB PGF ENT

THIS IS THE REPLACEMENT TEXT FOR SECTION 12.

T2 PAGE 2 MORE FPG PGB PGF ENT

Figure V-34. Text Section Replacement Displays (Continued)

h. Function 8: Replace a Line within a Section

Selection of this function will cause a screen to be displayed inviting the user to enter the line to be replaced (80 Characters or fewer), the line to replace it (80 characters or fewer), and either the section number or the word "ALL" if it is desired that the specified line be replaced in all text sections. (see Figure V-35.) Having done this and having keyed ENTER DATA, the desired action will be taken. Note that all occurrences of the string to be replaced will be replaced, either in a single text section or in the entire message.

Error displays will be returned if the message becomes too large, if the text string to be replaced cannot be found, or if the section number does not exist.

REPLACE A LINE OF TEXT

REPLACE THE LINE: TEXT STRING A

BY THE LINE: TEXT STRING B

IN SECTION # (OR 'ALL'): ALL

Figure V-35. Replace a Line Within a Section Display

1. Function 9: Terminate Message Editing

The selection of this function followed by an ENTER DATA indicates that the user has completed editing a message. Control will be returned to the program which called the message editor. It should be noted that whenever the selection menu is displayed and ENTER DATA is pressed when no option has been selected, the same action will occur.

SECTION E

PHYSICAL CHARACTERISTICS OF THE TEKTRONIX 4010 TERMINAL

1. GENERAL

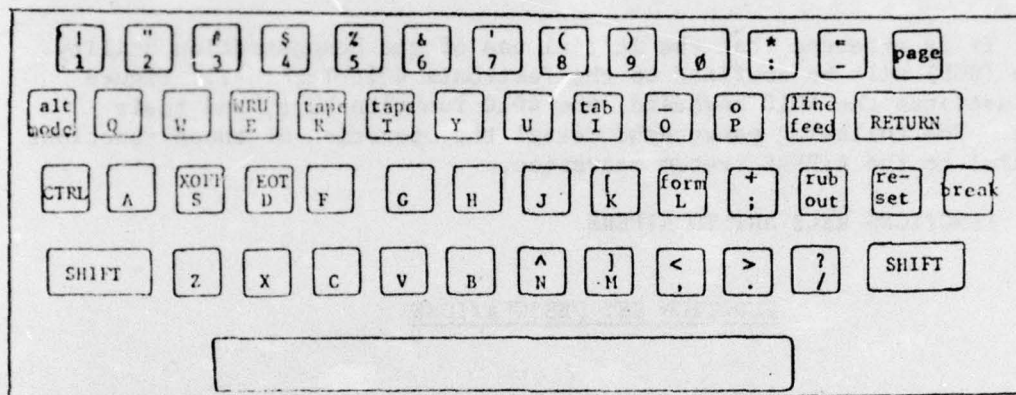
It is expected that the initial use of the Demonstration Utility Prototype (DUP) will be confined to the Tektronix 4010 Terminal. Figure V-36, illustrates the 4010 keyboard, the 4010 function keys, and their operation. The following paragraphs detail the operation of those functions keys crucial to the AIPERS system operation.

2. FUNCTIONS RELEVANT TO AIPERS

FUNCTION KEY DESIGNATIONS

	S9B		LTP	
CTRL	38	A	1 252	ENTER COMMAND MODE
CTRL		B	2	
CTRL		C	3	RSX CONTROL INPUT
CTRL		D	4	
CTRL	37	E	5 251	SELECT OPTION UNDER CURSOR [OR SEL# IF GIVEN]
CTRL		F	6	
CTRL	28	G	7 253	MOVE CURSOR TO NEXT S.A.
CTRL		H	8	MOVE CURSOR TO PRIOR INPUT FIELD
CTRL	29	I	9 254	MOVE CURSOR TO NEXT INPUT FIELD
CTRL	33	J	10 241	MOVE CURSOR TO S.A. 'HOME'
CTRL	33	K	11 242	MOVE CURSOR DOWN IN S.A.
CTRL	33	L	12 244	MOVE CURSOR RIGHT IN S.A.
CTRL		M	13 226	FIRST PAGE OF S.A.
CTRL		N	14 275	PREVIOUS PAGE OF S.A.
CTRL		O	15	
CTRL	34	P	16 255	ENTER DATA
CTRL		Q	17 221	ENTER CROSS HAIR SELECTION MODE[& CROSS HAIR DATA]
CTRL		R	18	
CTRL		S	19 0	TURN OFF MODE[VALID ONLY IN X HAIR & COMMAND LINE ENTRY MODE]
CTRL		T	20	
CTRL	35	U	21 256	CLEAR FIELD
CTRL		V	22	
CTRL		W	23	
CTRL		X	24	RSX CONTROL INPUT
CTRL		Y	25	
CTRL		Z	26	

CTRL	33	SHK	27	243	MOVE CURSOR UP IN S.A.
CTRL	33	L	28	245	MOVE CURSOR LEFT IN S.A.
CTRL	36	M	29	22	GRAPHIC MODE[FOLLOWED BY FULL ECHO]
CTRL		N	30	274	NEXT PAGE OF S.A.
CTRL		SHO	31	Ø	ALPHA MODE[LEAVE GRAPHIC MODE]



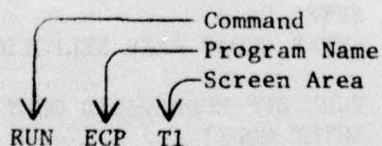
4010 Keyboard Keys

Figure V-36

a. CTRL A Enter Command Mode

Once the exercise system software is installed, the Control Team terminal screen will be blank with the cursor positioned at the command line.

The Command:



is entered from the Keyboard. CTRL A is then entered to activate the command. This causes the Exercise Control Processor to begin the exercise.

b. CTRL G Move Cursor to Next Screen Area

For the Control Team terminal, this key will only be needed to move the cursor from the command line to the working screen area after the first display appears on the screen. (This is the screen which requests exercise parameter.)

c. CTRL F First Page of display

CTRL N Prior Page of display

CTRL SH N Next Page of display

These three function keys allow the terminal user to page back and forth through multiple-page displays.

d. CTRL H Move cursor to prior input field

CTRL I Move cursor to next input field

These two keys are used during the process of entering data into input fields which are present on the current page of the current display

e. CTRL J Move cursor to Screen Area "HOME"

CTRL K Move cursor down in Screen Area

CTRL L Move cursor right in Screen Area

CTRL M Move cursor to first input field in next line

CTRL SH K Move cursor up in Screen Area

CTRL SH L Move cursor left in Screen Area

The above function keys, as well as those on the preceding pages, allow repositioning of the cursor in input fields. Note that if no input fields are present in the screen, then these function keys are inoperative. Also note that cursor positioning does not affect data already entered into input fields by the terminal user.

CTRL J moves the cursor to the first character position on the first input field on the current screen page.

CTRL K and CTRL SH K move the cursor vertically, down and up, respectively, in the screen area. The horizontal position of the cursor (its position within the line) is not affected unless the terminal tries to move the cursor to a display-only field.

CTRL M moves to the first input field in the next line.

CTRL L and CTRL SH L move the cursor horizontally, right and left, respectively, in the screen area. The vertical position of the cursor is not affected.

f. CTRL N Clear Input Field

CTRL R Rewrite Screen

CTRL N allows the terminal user to clear the input field in which the cursor is positioned, or the current line of the input field if the field takes up more than one line.

CTRL R rewrites the current display with all input fields intact. It is useful for deleting extraneous characters from the screen which have been "typed over."

g. CTRL P

ENTER DATA

ALT MODE

Once input fields in a display are filled in to the terminal user's satisfaction, either CTRL P or ALT MODE cause the data and control to be returned to the processing program.

h. CTRL C RSX Control Input

CTRL X RSX Control Input

Both CTRL C and CTRL X should be avoided at all costs. They cause terminal control to be returned to the system, away from TTDL and the exercise.