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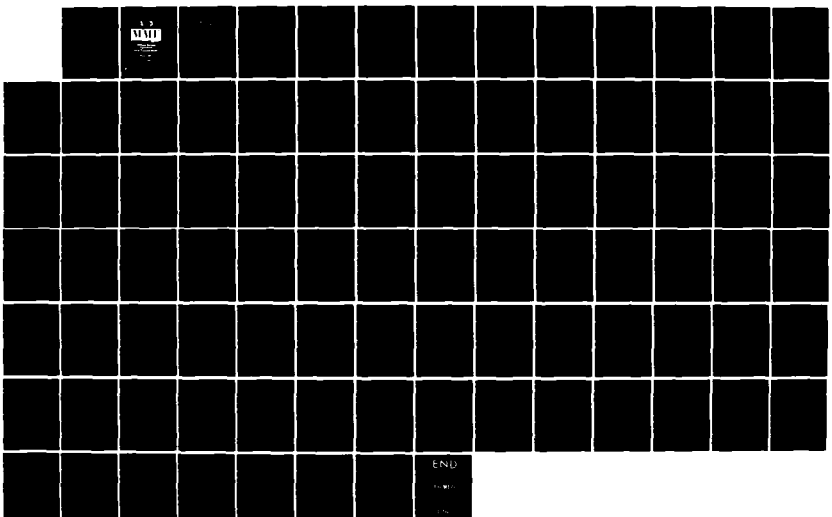

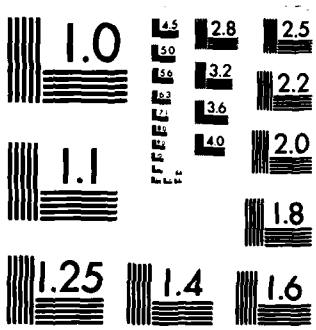

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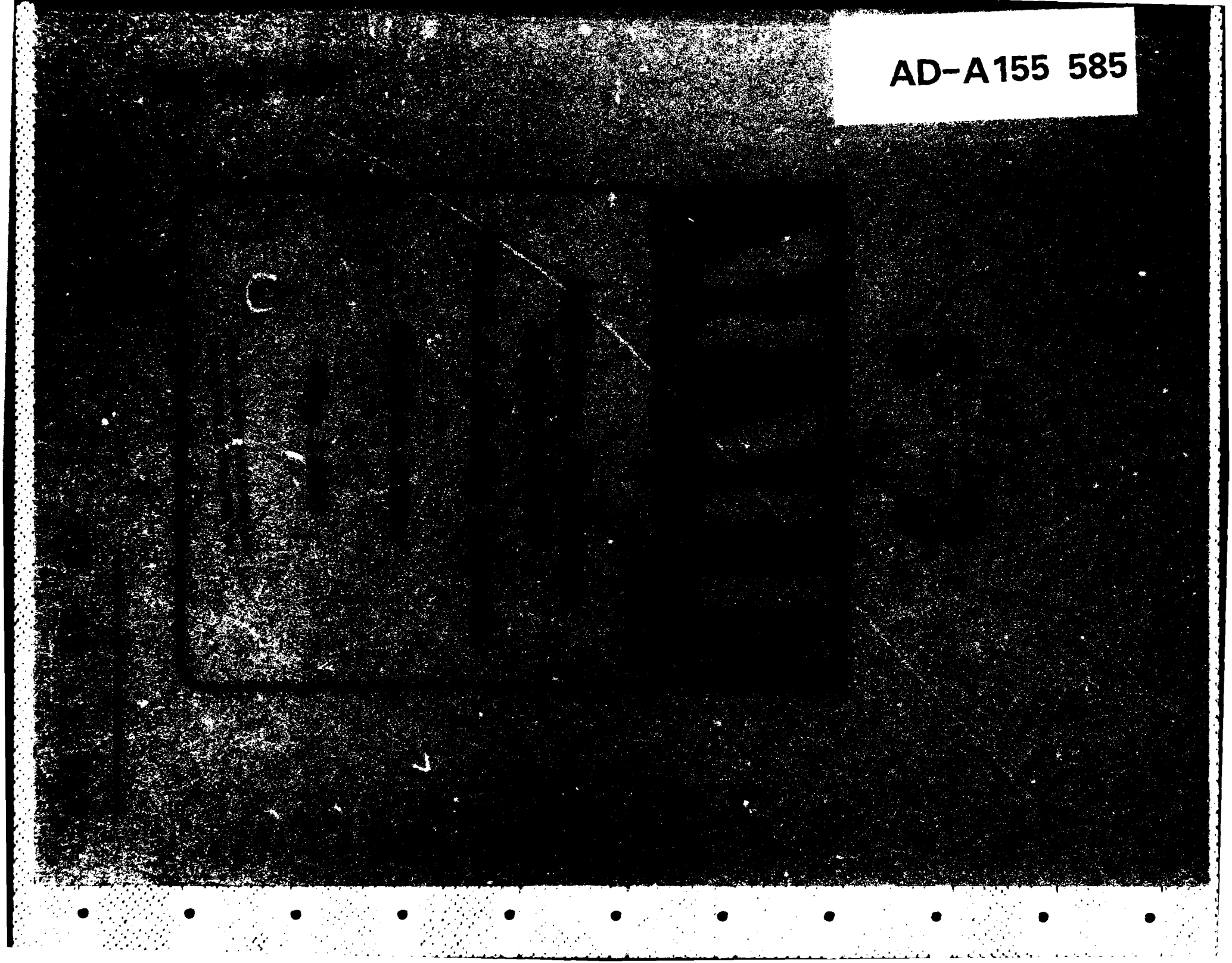

MITRE Technical Report

MTR-3919

Military Message Experiment Final Training Report

David G. Miller

MAY 1980

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ABSTRACT

The experimental phase of the Military Message Experiment was conducted at Camp H. M. Smith, Hawaii, from June 1977 through September 1979. MITRE was responsible for training the users of the automated message handling system used in the experiment. This report covers the training methods and materials used, discusses the experience gained with those methods and materials, and presents a plan for training users of future military message handling systems.

PREFACE

This document is the seventh of eight volumes of the MME Final Report. The volumes of the MME Final Report and their topics are:

Volume	I	Executive Summary
	II	Final Report
	III	User View
	IV	Message System Utility
	V	Sigma Architecture
	VI	Data Analysis and Discussion
	VII	Training
	VIII	Future Systems

The opinions expressed in this volume are those of the author, and do not necessarily represent those of The MITRE Corporation or the MME project sponsors. Information in this report has been used as the basis of conclusions drawn in Volumes I and II. Readers interested in obtaining the remaining volumes of the MME Final Report should contact:

Naval Research Laboratory
Washington, DC 20375
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TABLE OF CONTENTS

Section		Page
	LIST OF TABLES	xi
1	INTRODUCTION	1
	BACKGROUND	1
	THE SYSTEM	1
	THE USER COMMUNITY	2
	GOALS	2
	CHRONOLOGICAL SUMMARY	3
	Preliminary Period	3
	Limited Experimental Use	3
	Full Experimental Use (FEU)	4
	CINCPAC Exercise	4
	Intensive Outgoing Message Use Period	4
	Simulated Exercise	4
2	TRAINING APPROACH AND MATERIALS USED	5
	COMPONENTS OF THE TRAINING PROGRAM	5
	Least Impact on CINCPAC	6
	INTRODUCTORY LECTURE	6
	LESSONS AND EXERCISES	7
	VENDOR-SUPPLIED DOCUMENTATION AND OPERATIONAL AIDS	8
	Primer	8
	Reference Manual	9
	Operational Aids – the PROMPT and HELP Keys	9

TABLE OF CONTENTS (Cont'd)

Section		Page
	DOCUMENTATION PREPARED ON-SITE	10
	User's Guide	10
	Milestones	10
	Outgoing Message Guide	11
	Special Exercise User Instructions	11
	On-Site Handouts	11
3	TRAINING EXPERIENCE	13
	EVOLUTION OF TRAINING WITH TIME	13
	LEVELS OF USER COMPETENCE	14
	The J3 Training Reports	14
	Skill Levels Reached	15
	USE OF THE ON-LINE LESSONS	17
	TRAINING VIA TESTS AND EXERCISES	20
	USER REACTIONS	20
4	CONCLUSIONS	23
	THE TRAINING DIRECTOR	23
	Experimental Situations	23
	Operational Situations	23
	Qualifications of a Trainer	24
	TRAINING COMPONENTS	24
	On-Line Lessons	24
	Documentation	25
	Peer Training and On-the-Job Training	25
	Automated User Aids	25
	The Introductory Lecture	26

TABLE OF CONTENTS (Concl'd)

Section		Page
	ENVIRONMENTAL CONSIDERATIONS .	26
	System Stability	26
	Access to Secure Areas	27
	A RECOMMENDED TRAINING APPROACH	27
LIST OF APPENDICES		
A.	User's Guide to MIlitary Message Experiment	29
B.	Milestones	51
C.	Outgoing Message Guide	61
D.	Exercise Special User Instructions	73
E.	Training-Related User Comments	79
REFERENCES		83

LIST OF TABLES

Table		Page
1	Sigma Lesson Index	8
2	Number of People Receiving Introductory Lecture	14
3	J3 Estimates of User Training Levels	15
4	Skill Level Descriptions	16
5	Skill Levels	16
6	Lesson-Taking Summary	17
7	Lesson Taking by Lesson Number	18
8	Relation of Skill Levels to Lessons Taken	19
9	Relation of Skill Levels to Other Factors	19
10	User Reaction to Training-Related Items	21

SECTION 1

INTRODUCTION

BACKGROUND

The Military Message Experiment (MME) was established to evaluate the utility of an automated message handling system in a military environment. The technology was derived from automated systems then operating on the ARPANET, a computer-communications network developed by the Defense Advanced Research Projects Agency (DARPA). Three developers, experienced in building computer programs which handled messages, were each asked to construct a prototype system. Special design features were required to make the systems useful to military users, and to take into account the special problems imposed by the need to conform with military security regulations. In February 1977 the three prototype systems were evaluated; Sigma, produced by Information Sciences Institute (ISI), was chosen for the experiment.

The experiment was jointly sponsored by DARPA, the Navy, and CINCPAC. Funding was provided by DARPA and the Navy; CINCPAC acted as the host site. The test community was a portion of the Operations Directorate (J3) of the CINCPAC staff. Twenty-four Sigma terminals placed throughout the Directorate were used for as many message handling functions as practical; their use partially replaced the physical handling necessary for messages normally printed on paper and circulated manually.

THE SYSTEM

The system ran on a dedicated PDP-10 computer coupled to a PDP-11 front-end processor. Specially modified Hewlett-Packard 2649A terminals in user offices were connected to the front-end processor, as was a circuit from the Local Digital Message Exchange (LDMX) processor. This circuit was used to transfer traffic of interest to J3 from the AUTODIN network to the MME system. Messages were stored by the PDP-10 computer for a period of approximately four weeks, after which they were archived on magnetic tape. The J3 system users could log on to their Sigma accounts and perform a number of standard operations on their messages, including message routing, reading, filing, annotation, creation, and coordination. Each user account in Sigma had a special file, called Pending, that the system used as a mailbox. Incoming J3 traffic was first routed to the J3 administrative office. From there, message routers used their terminals to distribute messages to appropriate destinations (reference 1).

THE USER COMMUNITY

The J3 users of Sigma could be loosely grouped in three classes: message routers, administrative/clerical personnel, and action officers.

Message routers worked in J301, the J3 administrative office mentioned above. Their function, in the electronic system as well as in the manual system, was to route traffic to appropriate offices within J3. Message routers had little or no interest in the content of a message, except to the extent that it helped them direct it to the correct recipient(s). They did little filing but acted only as a processing stop in the progress of a message from the LDMX to its ultimate recipient(s). Their use of Sigma stressed instructions for forwarding, action assignment, and deletion.

Administrative/clerical personnel were usually responsible for maintaining office message files, and for retrieving messages from them when requested to do so by action officers. Usually their interest in a message's content was confined to what they needed to know for effective filing. In some cases they were responsible for preparing drafts of outgoing messages under an action officer's direction and for seeing that the draft was sent to other offices for coordination and/or release. Thus the administrative/clerical personnel needed to know the instructions for filing, retrieving, and drafting messages, and for routing the drafts to other offices before their release.

Action officers were responsible for taking whatever action the contents of the message required. As a group they could be subdivided into watchstanders and staff officers. Watchstanders worked shifts in jobs which had to be manned around the clock. Their principal duty with regard to messages was to monitor current operations in the Pacific, and to take action on important traffic which arrived after normal office hours. Staff officers handled traffic which did not need immediate action -- by far the largest portion. Thus the watchstanders needed to be alerted to the arrival of important messages, and needed to prepare reports for the commander to see on his arrival in the morning. Staff officers were more concerned with providing continuity for current projects, and thus were more involved with filing and with outgoing message preparation. These differing job requirements caused the two subgroups to emphasize different instruction sets.

GOALS

The formal goals of the Military Message Experiment are listed in its Test Plan (reference 2). Two of the nine listed goals are pertinent to this paper: to develop and document a process for introducing a military message system into an operational command; and to determine the nature of training requirements for implementation of a military message system. This report is particularly concerned with one aspect of the user interface: training the user. The experiment shed some light on questions such as "Are on-line lessons an effective teaching device in introducing new computer-based systems to military users?" Data to answer questions of this type was collected by automatically recording instruction usage while users were on the system, and by interviewing users before the experiment ended.

Succeeding sections will discuss first the training approach and materials used during the MME, and then the training experience gained during the experiment. The last section offers some conclusions and recommendations for training users of future military message handling systems.

CHRONOLOGICAL SUMMARY

In discussing the user training undertaken during the MME, it is convenient to divide the experiment into several time periods: preliminary use, from spring 1977 when the hardware and software was first installed until about May 1978; limited experimental use (LEU), from May 1978 until the system met the acceptance criteria; full experimental use (FEU), which started in February 1979; a CINCPAC exercise; a period of intensive outgoing message use; and a simulated exercise. The phases of the experiment were not mutually exclusive; the two exercises and the period of intensive outgoing message use occurred during FEU.

Preliminary Period

During the preliminary period the system was used primarily by project personnel for testing and debugging purposes. About June 1977 a few "friendly users" were trained -- people who had been designated by J3 as points of contact, or who were expected to be frequent users. This included several key clerical personnel, both in the operating divisions of J3 and in J301, the administrative office responsible for message distribution. They understood that the system had not yet reached adequate levels of reliability and responsiveness. One of the benefits of the early training was that these users reported bugs to us, and suggested improvements for inclusion in later versions of the system. Another advantage was that they helped us conduct system tests by entering a series of carefully scripted instructions at prearranged times.

During the latter part of the preliminary period, starting about December 1977, new users were added to the system at a faster rate. At various times the system appeared to be approaching the levels of reliability and responsiveness required for LEU; as a result many more people were given the introductory lecture and urged to begin taking the on-line lessons. However, various problems delayed the start of LEU until May 1978, so that many of those who had been introduced to the system during the preliminary period had no need for Sigma until much later (and a few of them were transferred before ever using it).

Limited Experimental Use

LEU began in May 1978, and continued until February 1979. Personnel in the participating divisions of J3 were urged to use Sigma for as many message handling tasks as they could without impeding their daily work. It was understood that the manual system would continue to be the primary message handling tool.

Full Experimental Use (FEU)

In February 1979 J3 decided that Sigma had come close to meeting the criteria to become the principal message handling tool in the participating divisions. Primarily availability and reliability considerations, the criteria established the maximum downtime tolerable during specified intervals. On 22 February J3 directed (rather than urged, as during LEU) that Sigma be used whenever possible for message handling. Certain tasks, such as coordination of outgoing messages with staff officers who did not have Sigma terminals, were excepted. The manual system was still operated, both as a backup system and as the principal system for the excepted tasks. The first few months of FEU saw the heaviest use of Sigma, but as the end of the experiment drew near there was a gradual decrease in use of Sigma and a corresponding increase in reliance on the manual system.

CINCPAC Exercise

In March 1979 CINCPAC took part in an exercise -- a carefully scripted simulation of crisis conditions. Special groups of officers were formed to deal with exercise matters, such as a sharply increased volume of incoming and outgoing traffic. During this exercise the manual system was used for message handling, but a couple of Sigma terminals were made available to the exercise players who had used Sigma in their daily work. Some exercise people who had not previously used the system were given a modest amount of training, so that if the opportunity arose they too could utilize Sigma.

Intensive Outgoing Message Use Period

In the waning months of the experiment the project staff concluded that, for a number of reasons, there had not been enough use of Sigma's outgoing message generation and coordination features. To overcome this deficiency in experimental data the project staff, in cooperation with J3, designated a two-week period in August 1979 as one in which J3 users were urged to do as much message drafting and coordination as they could using Sigma, rather than manual methods.

Simulated Exercise

One of the important questions about a military message system is "Does it have military utility during crisis conditions?" As the end of the experiment approached, quite a bit of data had been collected on use of Sigma during peacetime, or routine, operations, but very little data had been collected on its utility during crisis conditions. Because no exercise was scheduled to take place in the time remaining, it was decided to rerun, at a faster pace, certain portions of the exercise that had been conducted in March. However, this time Sigma was to be the only message handling vehicle, and enough terminals were provided so that each participant could have one. In September 1979 this exercise was carried out. The taped messages that had arrived during the earlier exercise were used as the source of incoming traffic. Since this exercise was much shorter than its March predecessor, only a few people, most of them experienced Sigma users, were involved.

SECTION 2

TRAINING APPROACH AND MATERIALS USED

COMPONENTS OF THE TRAINING PROGRAM

The training program designed for J3 had four main components: an introductory lecture, on-line lessons and exercises, printed documentation, and individual training sessions.

The purpose of the introductory lecture was to introduce new and potential users to Sigma in a way that would explain the objectives of the experiment to them and motivate them to use the system. The lecture was intended to overcome any tendency to think the automated system was just something else to learn -- a complex stumbling block for users to surmount to get their job done. It was not intended to train users, but to prepare them for training -- to bring them to the level at which they would be able to log on and take lessons. The lecture is discussed in more detail later in this section. A version of it used in January 1978 was printed in an earlier training report (reference 3).

The lessons were expository in nature, and discussed aspects of commonly used instructions. Exercises allowed users to practice instructions that were being taught in the lessons in a tightly controlled environment, using messages and files especially designed for that purpose. Great care was taken to see that lesson takers could not accidentally damage operating files and messages while taking lessons. Lessons and exercises are discussed in more detail later in this section. Sample lesson and exercise texts have been previously published (reference 3).

Some printed documentation had a role in training as well as serving as a reference source for operations. ISI published a Primer for the use of Sigma (reference 4), as well as a detailed reference manual (reference 5). These documents are discussed in detail later in this section; excerpts from each of them were previously published (reference 3). In addition to formally published material, printed handouts were distributed from time to time to some or all of the users.

Another aspect of the training approach involved supplying users with individual training sessions when they required them. These sessions were either general in nature, dealing with all aspects of the system, or tailored to fit the needs of a particular user's job. In some cases the trainer merely watched the user performing his message handling duties and made occasional suggestions; in others the trainer studied the office functions, distributed handouts and conducted follow-up sessions.

Least Impact on CINCPAC

The experiment had to be designed to achieve its goals while disrupting J3 operations as little as possible. It was vital, of course, not to impair J3's ability to do its job -- conducting military operations in the Pacific. This meant that needed capabilities must be kept operating, and people could not be taken away from their jobs for training frequently or for extended periods.

The on-site staff consisted of people from diverse sources: CTEC Incorporated; The MITRE Corporation; NavTelCom; Naval Research Labs; Bolt, Beranek, and Newman; and ISI. The training director was part of the project staff rather than someone from the user community, and so could devote full time to the experiment. Thus the possibility of a change partway through the experiment, which could have happened had a military person been assigned the job and then undergone normal rotation to another assignment, was eliminated. By working closely with other project personnel he achieved a level of expertise that might not have been possible for a J3 staff member with other duties. The trainer was also responsible for responding to user questions throughout the day, and he stayed on-site throughout the experiment.

Another important feature of the training, designed to reduce operational impact on the user, was the decision to make heavy use of an on-line tutor rather than formal classroom training. A perceived advantage of on-line lessons was that they would avoid the air of pedagogy present in a classroom, which middle and senior grade officers might have found irksome. With an on-line tutor, users could take lessons in their own workspace at a time convenient to them. This meant too that the office need not be understaffed while people were excused to go to class; if something came up requiring the attention of the lesson-taker, he could leave the terminal to attend to office business, and then resume the lesson. Another advantage of on-line lessons was that a user could proceed at his own pace. If he felt the need to retake a lesson, he could do so without embarrassment. Conversely, if he was learning the material quickly, he could proceed to advanced lessons without having to wait for fellow class members to reach his level.

INTRODUCTORY LECTURE

The introductory lecture was the first point of contact most users had with the MME, apart from word-of-mouth information and rumors. It gave the experiment staff an opportunity to indoctrinate users by telling them a little about the background of the experiment, discussing and demonstrating some of the features of the system, and bringing users to the level at which they could log on and start taking lessons.

The lecture had four parts: introduction and goals; the Sigma system; the terminal; and help for the users. The first part discussed project background and goals in terms similar to those given above. The second part summarized how Sigma worked. Since many potential users might not have had much experience with data processing systems, Sigma's most helpful features were highlighted. Then, to insure that the user's expectations were realistic, some of the things Sigma was not good at were stressed, to try to forestall users' disappointment when they found out the system couldn't do everything. The intent was to help clarify to the user the

things Sigma could do for him, and the things that he would have to continue to do for himself. The purpose of the third part of the lecture was to familiarize the user with the mechanics of operating the terminal -- to explain what the various lights and keys were used for, and how information was displayed for his use. This part usually finished with a quick demonstration -- logging on, followed by a few typical instruction entries. In this part users were also shown how to start taking lessons. Finally they were told how to get help -- what instructions they could enter or keys they could push to get it while they were on-line, where to look in the documentation, and whom to call if none of those actions solved their problems.

Lectures were given to individuals and groups of up to seven people, five being typical in the earlier days of the experiment when there were many new users to be trained. The lecture was given in front of an MME terminal which contained a special circuit board driving a large-screen monitor for easier visibility, since the HP-2649A terminal screen was too small for comfortable viewing by more than a couple of observers. The lecture took about an hour and a half to deliver. Afterward the attendees were told that Sigma accounts would be opened for them. They were given a handout, discussed below and previously published (reference 7), with information on logging on and taking lessons. They were also given the text and copies of slides used in the lecture and copies of the reference manual, if they wanted them. Later, when primers became available, they were given to attendees.

As the lectures were being given they seemed to be fairly well received, although later interviews disclosed widely varying reactions. A few users asked a lot of questions, but most seemed to accept what was told them without many questions. One asked to hear the lecture a second time, since a long time had elapsed between the first delivery and the time he wanted to become active on the system. As time went on the amount of material covered grew smaller. As the experiment drew to a close, and the prospective users being trained only expected to use Sigma for a short time, the lecture evolved into a hands-on session for the new user.

LESSONS AND EXERCISES

The lessons (table 1) contained written information about various aspects of Sigma, displayed on a terminal screen. At certain points in some lessons the lesson-taker was asked if he would like to carry out a training exercise. If he did (and users were urged to do all the exercises), he issued an instruction -- "EXERCISE 1", for example. This temporarily replaced the lesson material with text illustrating a Sigma operational instruction. The exercise discussed the instruction's syntax and semantics and asked the user to try it out. He then issued the instruction, and possibly some ancillary ones to set up files, messages, or text objects required. Once the instruction was executed the affected Sigma item (file, message, or text object) was shown, so that the user could see the effect of his actions. He could cause his terminal display to alternate between the Sigma object and the exercise text. The exercise text might have him carry out further instructions, and called his attention to certain characteristics of the displayed object. When finished with the exercise he could return to the lesson at the point where he had left off. He could continue the lesson, or stop and return to it later; but in the latter case he would have to scroll ahead to his place in the lesson; Sigma would not remember his stopping place for him.

Table 1. Sigma Lesson Index

Lesson 1:	A General Description of the Sigma Service
Lesson 2A:	Beginning to Use the Sigma Service
Lesson 2B:	Beginning to Use the Sigma Service
Lesson 3A:	The Filing Service - Basic Filing Techniques
Lesson 3B:	Advanced Filing Techniques
Lesson 3C:	Special Files
Lesson 4:	Message Reception and Distribution
Lesson 5A:	Text Objects
Lesson 5B:	Editing Instructions for Text Objects
Lesson 5C:	Editing Instruction Keys
Lesson 6:	Message Drafting
Lesson 7:	Message Review and Coordination

The system was protected from the lesson-takers in several ways. In the first place, users had to close out normal Sigma objects before taking a lesson. For example, Sigma would not allow one to take a lesson while working on an operational message file. Special objects were used for illustrative purposes in the exercises. In an exercise only needed instructions could be used; others were rejected, except those used to change the display from Sigma objects to exercise text, and to return to the lesson. Finally, when the user left the lesson, the work he did was undone, and the special objects used in the exercises were restored to their previous state.

VENDOR-SUPPLIED DOCUMENTATION AND OPERATIONAL AIDS

Primer

ISI created a Primer (reference 4) for use by those not needing or ready for the detail of the more technical Reference Manual. It was written in a conversational style, and was meant to be easier to read for those who had not yet learned the system well, or who did not appreciate the more technical level of the reference manual.

The Primer covered the basic Sigma system. Following an introduction came a discussion of the terminal; logging on and logging off; sections on messages, message files, text objects, selectors and miscellaneous instructions; and finally a brief discussion of the Reference Manual and the on-line lessons. The Primer's only published edition was dated November 1977; as new features were added to the system after that, it became somewhat out of date.

The Primer was written by someone not directly involved in Sigma's design or construction, and it attempted to answer for the user the same questions the author had when she tried to learn to use Sigma. The section on accessing Sigma led the user through every step required, and gave illustrations of how the terminal should have appeared after each of those steps. The size of the Primer was 4 1/2 by 5 1/2 inches, making it convenient to leave near the terminal or carry around. It was used frequently by new CINCPAC users.

An excerpt from the Primer was shown in the previous training report (reference 3).

Reference Manual

The Sigma Reference Manual (reference 5) was a 67-page compilation of detailed information about Sigma. It served more as a means of finding out the fine points of instructions to carry out than of learning which instructions to use. Approximately the first half of the document discussed Sigma's features, while the last half presented the details of the instructions in alphabetical order.

The first half of the manual had several sections: introductory material; information on the formats used to create or display messages; a discussion of the file system; a discussion of the Alert feature, which calls attention to the arrival of important messages; information on message drafting, review, and coordination; and an explanation of the terminal, with sections on how information was displayed on the screen and how the keys were used. The second half began by discussing parameters used in some of the instructions, and then had sections on each of about fifty different instructions. An excerpt from the Reference Manual was included in the previous training report (reference 3).

Operational Aids - the PROMPT and HELP Keys

Sigma provided its users two special terminal keys -- labelled PROMPT and HELP -- that they could use for support during operations.

The PROMPT key responded by displaying in a special format all alternate forms of the instruction being typed or, if the instruction line was empty, all instructions legal in the given situation. The information was succinct -- one line with the syntactical information and one line of explanatory material. The user could put the cursor on an instruction and press PROMPT again to see a slightly more detailed explanation of each of the terms used in the syntactical definition. When he wished the screen to return to its pre-PROMPT state, he pressed the PROMPT key once more.

The HELP key showed the user an on-line form of the Reference Manual. It enabled him to switch the display from one topic to another (in effect, turning pages in the manual). By moving the cursor to certain locations on the display screen and pressing the HELP key the user could turn to a selected topic, return to a previous topic, or type in a new topic and turn to it. When finished browsing, he could return the screen to its regular display by pressing the CANCEL key.

DOCUMENTATION PREPARED ON-SITE

From time to time written material was generated and prepared on-site and distributed to some or all of the users. Five examples of this material are described here: the User's Guide; the Milestones; the MME Outgoing Message Guide; special user's instructions for the exercise; and various special handouts.

User's Guide

Shortly before full experimental use began, J3 and the project staff jointly decided that a new level of documentation was needed. The Reference Manual and the Primer had both been found to be useful documents, but neither approached the use of Sigma from a functional point of view. That is, with the possible exception of material on message drafting and coordination, neither took the user step-by-step through the functions he performed in his daily work. This was only natural, since ISI, which wrote both documents, had not had an opportunity to observe J3 at work over an extended period of time.

To fill this gap, J3 and the project staff jointly wrote a "Users Guide to Military Message Experiment" (included as Appendix A of this report). The approach used in writing the guide was to show the user the sequences of Sigma instructions he could issue to carry out specific message handling tasks. The result was a compact (24-page) guide which was used extensively by J3 personnel.

The tasks were compiled by merging the message handling chores normally performed in several different J3 offices. Probably no task (except logging on and off) was performed in all offices, nor was there any one office in which all tasks were done. The tasks covered in the guide included logging on and off; taking lessons; filing messages; displaying J3 readboards (lists of important messages and other forms of communications, prepared daily by watchstanders for the director of J3); using Sigma's Alert procedure (which notified users of the arrival of important messages); drafting and coordinating outgoing memos and messages; and readdressing incoming messages.

Milestones

Shortly before the J3 staff began extensive use of Sigma, a need to gauge the progress of new users became apparent. Although one could tell from Sigma's automatically generated records who was taking lessons and who was not, it was not easy to tell whether people had been able to apply their knowledge to J3's ordinary message handling tasks.

To help monitor the proficiency of J3 users, J3 and the project staff set up a series of "milestones" (Appendix B) -- sequences of instructions designed to ensure that each user had carried out a few simple tasks in handling messages. A member of J3 examined the weekly session transcripts (records of instructions executed during each user session), and then prodded those who hadn't yet complete the milestones, until finally nearly all the frequent Sigma users (except higher-ranking officers) had completed them.

Outgoing Message Guide

To help prepare users for the period of intensive use of outgoing messages described in Section 1, the project staff prepared an "MME Outgoing Message Guide" (Appendix C). This document was based on the sections of the User's Guide that dealt with outgoing messages, but was edited, expanded, and brought up to date to include information on new features that had been added to Sigma to make outgoing message preparation easier.

Special Exercise User Instructions

During the simulated command post exercise held in September 1979 Sigma was to be the only means that the exercise participants could use for handling messages. For this exercise a short set of special user instructions was put together (Appendix D). Its emphasis was strictly functional -- that is, it covered a small number of tasks that we expected the participants to have to do frequently, and spelled out in some detail the instructions that a user could issue to carry them out. The tasks included logging on, reading incoming messages, filing them, using selectors and the alert feature, generating outgoing messages, and building such special exercise items as logs of pending matters and situation reports.

On-Site Handouts

Another small document prepared on-site contained a discussion of taking lessons on Sigma which had been published in the previous training report (reference 3). This handout was produced because some of the early trainees were having difficulty remembering all the things they were expected to do to get logged on and start taking lessons. It was distributed at all but the first few introductory lectures, and copies were distributed to some users who had attended lectures before the handouts were available.

At a later stage of user training we gave the users special expository material that suggested ways Sigma could be used to do the job required in their individual offices. Some of this material was published in the previous training report (reference 3).

SECTION 3

TRAINING EXPERIENCE

During the experiment approximately 200 CINCPAC users received some sort of Sigma/MME training. This section presents some results of that training. After a brief description of how the training changed as the experiment proceeded, information based on data collected and interviews conducted will be discussed. Among the results, skill levels reached are correlated with other factors, and some user reactions to the training are included.

EVOLUTION OF TRAINING WITH TIME

During the course of the experiment the type of training users received gradually changed. In the preliminary period most information came from the experiment staff, particularly from the training officer. Sigma was then neither as reliable nor as responsive as it later was, lesson-taking was sometimes awkward, and on-the-job training was at its least rewarding. The users had to rely more on documentation and on information from the experiment staff and from experiment liaison people within J3. Some statistics on lesson-taking during the preliminary period have been published (reference 3).

As LEU approached individual training sessions were held with some users. From 10 May 1978 until 28 June 1978 the training director sat in on eleven J301 message routing sessions for periods ranging from one to three hours. Since routing messages to their ultimate recipients was viewed as a critical step in the use of the system during LEU, it was particularly important to get that off to a good start. Three different people carried out the routing, and gradually all three learned the instructions they needed well enough to do their job effectively.

As time passed users were better able to learn from the system itself by means of on-line lessons, on-the-job training and information from other users. At the same time a wider variety of written material was available (for example, the User's Guide and various special handouts). In the last couple of months of the experiment some of the new users who stood watches in the CINCPAC command center received virtually all their instruction by on-the-job training and by instruction from their peers, rather than from the experiment staff, who were preoccupied with setting up special events such as the simulated exercise and the period of intensive outgoing message use.

Table 2 summarizes the number of users introduced to the system by means of the introductory lecture during each phase of the experiment. Note that not everyone was introduced to the system this way; 175 people received the lecture, while training data was kept on 207 individuals.

Table 2. Number of People Receiving Introductory Lecture

Period	Number
Preliminary Period	88
Limited Experimental Use	51
Full Experimental Use (exclusive of exercises)	25
CINCPAC Exercise	9
Simulated Exercise	2
Total	175

The introductory lecture was changed more than any other training component. Initially conceived as a one and one-half hour presentation by the trainer to a group of users with a short demonstration by the trainer at the end, it gradually evolved into a forty-five or sixty minute session with the user sitting at the terminal and the trainer helping him to decide which keys to press. Part of the reason was that near the end of the experiment there were fewer new users to introduce, and it was easier to find the time to spend with them individually. But also it seemed clear that the individual hands-on sessions were better received and benefited the users more.

LEVELS OF USER COMPETENCE

Two attempts were made to grade users according to the level of competence they reached in using Sigma. One was made by J3, to determine who needed more practice using Sigma or additional training. The second was made by the training director, as an attempt to correlate the level of skill with various factors that might have influenced it. Neither attempt made use of written or oral examinations or specific observations of users as they worked. That sort of activity was not appropriate in the working environment of a group of middle to senior grade officers.

The J3 Training Reports

From November 1978 until June 1979 J3 issued a series of "MME Training Reports", usually at weekly intervals. The reports were circulated to all Sigma users by means of messages created and distributed on Sigma. Users were divided into four categories: fully trained, partially trained, marginally trained and untrained. The grading was done by a Chief Petty Officer in a J3 division responsible for liaison with the experiment staff. Users were graded as untrained after they had received the introductory lecture but before they began to appear on the weekly summaries of Sigma usage. After their names began to appear on the weekly summaries they

were moved into the marginally trained category. Their further progress depended on how frequently they used the system, and on how the instructions they were issuing compared with those in the milestones (discussed in Section 2) established for their particular office. Deciding how to categorize each user thus required much subjective judgment by the Chief, who was herself a very competent user.

Table 3 summarizes the users' training status at a few selected times, as shown in the J3 reports. Some of the fluctuations in figures were due to transfers into and out of the test group during the experiment. Others were caused by deletion of one or two small offices from the test group.

Table 3. J3 Estimates of User Training Levels

Training Status	Number of Trainees				
	30 Nov 1978	13 Jan 1979	10 Mar 1979	12 May 1979	30 June 1979
Trained	25	41	62	94	90
Partially Trained	6	12	19	8	0
Marginally Trained	25	36	18	2	0
Untrained	44	20	4	3	9
Totals	100	109	103	107	99

Skill Levels Reached

While preparing this report, the training director assigned a skill level to each of 201 users who at one time or another were considered part of the test community (including those who used Sigma only during exercises), and who had some opportunity to use Sigma. The assignment of skill levels was based on the training director's contacts with the users, and on a review of system usage statistics. As it was arbitrary and subjective, the skill levels themselves are difficult to define with any precision (table 4). Table 5 summarizes the distribution of the skill levels.

Table 4. Skill Level Descriptions

Level 1:	Individual rarely used the system.
Level 2:	Used system infrequently for short sessions.
Level 3:	Used system once or twice a week for simple tasks.
Level 4:	Used system more often but not daily; reviewed incoming messages, may have done some filing and retrieving.
Level 5:	Usually had a daily session or more; knew Sigma well in the areas of tasks he normally performed.
Level 6:	A frequent and talented user; may have used Sigma in innovative ways.
Level 7:	An expert user; understood most of Sigma very thoroughly; often thought of new ways to use it.

Table 5. Skill Levels

Level	Number of Users
1	51
2	45
3	32
4	23
5	21
6	21
7	8
Total	201

USE OF THE ON-LINE LESSONS

As mentioned in Section 2, we expected that one of the principal methods of training the users would be the on-line lessons that were part of Sigma. The following paragraphs discuss apparent user reactions to these lessons, both from data that was automatically collected and from interviews later held with users.

Table 6 presents some lesson-taking statistics. Whenever a user took a lesson Sigma automatically made a record in a session transcript file, which was printed weekly. Using these records, we kept track of the lesson-taking activities of 207 potential users. Cases where a user took a particular lesson more than once are not reflected in Table 6. In the table it can be seen, for example, that 19 people took exactly three of the lessons, while 82 people took three or more.

As table 6 shows, only 56% of the potential users took any lessons at all. There is a plateau of lesson-takers out to about five lessons, beyond which the number decreases sharply, except for the eleven users who took them all. This suggests that most people lost interest in the lessons after taking relatively few of them.

Table 6. Lesson-Taking Summary

Total Lessons Taken	Total Lesson-Takers	Cumulative Lesson-Takers
12	11	11
11	1	12
10	2	14
9	3	17
8	4	21
7	8	29
6	5	34
5	15	49
4	14	63
3	19	82
2	18	100
1	16	116
0	91	207
Totals	207	207

Table 7 presents information on lesson taking by individual lesson. For the contents of the lessons, see table 1 in Section 2.

As tables 6 and 7 show, although the average number of lessons taken for all users was 2.6, among those who took any lessons it was 4.7. As would be expected, more people took the lower-numbered lessons. The data seem to suggest, however, that the lesson numbering itself might have had an effect on which lessons were taken. For example, several more people took lesson 4 than took lesson 3C. It may be that many users were not aware that there were lessons such as 3C, since if a user were to ask for lesson 3, he was shown lesson 3A. While the presence of the numbered and lettered lessons was made known to the users in several ways (documentation, introductory lecture, the HELP key on the terminal, and in the lessons themselves), they may have forgotten in the course of taking the lessons. It would have been better to have used a sequence of plain numbers.

Table 7. Lesson Taking by Lesson Number

Lesson Number	Number of Takers
1	104
2A	94
2B	66
3A	67
3B	41
3C	29
4	40
5A	29
5B	18
5C	18
6	23
7	19
Total	548

Table 8 correlates the skill levels with the number of lessons taken. It can be seen that there is a very high correlation (0.96) between the skill level and the number of lessons taken. While it might be argued that taking on-line lessons helped these users reach their higher levels of skill, there may also be some other factor in the makeup of this group of users that causes variables to be high.

Table 9 presents statistics on skill levels as a function of rank, position, interest, etc. Watchstanders probably scored higher than others because they had long sessions and devoted a larger fraction of their time to processing incoming messages. Higher grade officers had more non-message responsibilities, and therefore devoted less time to learning to use the system.

Table 8. Relation of Skill Levels to Lessons Taken

Skill Level	Average Number of Lessons Taken
1	0.9
2	1.9
3	2.4
4	3.3
5	4.0
6	5.2
7	7.9

Table 9. Relation of Skill Levels to Other Factors

Factor	Number	Average Skill Level
All Personnel	207	3.0
Officers	124	3.3
Enlisted Personnel	70	2.4
Civilian Personnel	12	2.7
Grade 4 Officers (Major, LtCdr.)	37	4.1
Grade 5 Officers (Lt. Col., Commander)	58	3.4
Grade 6 Officers (Colonel, Navy Captain)	25	2.3
All Marine Corps Personnel	11	3.2
All Air Force Personnel	67	3.5
All Navy Personnel	51	2.7
All Army Personnel	66	2.7
All Watchstanders	49	3.9
All Message Routers	13	3.1
All Those Interviewed	48	4.9
Interviewees with Training Opinions	33	5.1

TRAINING VIA TESTS AND EXERCISES

Certain J3 users had an opportunity to augment their Sigma experience by taking part in Sigma testing and in CINCPAC exercises. The tests were part of an attempt in the experiment's early stages to monitor the effect of various hardware and software improvements being made to Sigma. From one to twelve users were required. There were enough project personnel for the tests requiring few users; for the larger tests more people were needed, however, so some J3 people were asked to help. Moreover some terminals were located in workspaces that normally required special clearances for access, and it was often easier to ask the J3 people in the office to take part in the test than to make special arrangements to bring in outsiders.

The tests usually consisted of preset lists of instructions to be executed. The J3 users participating in the tests benefited from the practice obtained in using the system and from executing sequences of instructions that they might not otherwise use. This broadened their knowledge of Sigma. During exercises, similarly, some users were required to use Sigma for things which did not come up during their daily work. One or two exercise participants who had not previously been enthusiastic users of Sigma were required to use it during the exercise. They became much more frequent users afterward, having discovered for themselves that the system could do useful things.

USER REACTIONS

A series of interviews was conducted to record the users' opinions about automated message handling in general and Sigma in particular. A few interviews took place during the course of the experiment as certain frequent users left the command; most were done in August 1979 by people brought especially from the mainland for the purpose. In all, 48 of these interviews were written up. During 33 of them some mention was made of training, documentation, or some of the user aids provided by Sigma or by the experiment staff. Table 10 summarizes these opinions in numerical form. The opinions were given a subjective numerical rank by the training director on a scale ranging from 4 (very positive) through 0 (neutral) to -4 (very negative). The opinions in their raw state are given in Appendix E, with user identification removed. Some of them were responses to direct questions by the interviewer, while others were volunteered. The latter may be a little more negative than the solicited answers, since more users may have used the interviews to provide constructive criticism than to praise features they liked.

Note that the features which received the highest ratings were those based on personal contact and those dealing with aids specific to the users' jobs. The more formal, lengthy training items received lower ratings.

Table 10. User Reaction to Training-Related Items

Item	Number Responding	Average Opinion
Peer/On-the-Job Training	12	2.0
The User's Guide	4	1.8
The Primer	13	1.3
Dealings with Staff	4	1.0
Learning Only Necessary Parts	6	0.8
The Introductory Lecture	10	0.8
Ease of Learning Sigma	11	0.7
The Reference Manual	9	0.6
The Lessons	30	0.2
Training in General	8	-0.1
The HELP Feature	13	-1.0
The PROMPT Feature	11	-1.0
The Exercises	2	-1.5

SECTION 4

CONCLUSIONS

Using as a guide the experience gained during the MME, some conclusions can be drawn about individual components of the MME training approach. This section first discusses the role of the training director, and then the effectiveness of lessons, documentation, user aids, and the Introductory Lecture. Finally, the conclusions are integrated into a training plan for installing a message handling system in a hypothetical but typical military environment.

THE TRAINING DIRECTOR

Experimental Situations

In the experimental environment of the MME, having the project supply a training director worked out very well. He was able to devote full time to the experiment, since he was not burdened with collateral military duties. Furthermore he knew the system well before it was installed, and was able to keep up with changes as it evolved during the experiment. Knowing the system much better than any of the users was, of course, a more pronounced advantage in the experiment's early phases. Later some users reached a level of skill more than adequate to qualify them to teach the system to others.

Operational Situations

When a standard message handling system becomes available for major military commands, the situation will be quite different from that of the experiment. The system should be evolving slowly if at all, so it will not be as important to have an outside expert to keep up with the changes. Furthermore, except during the installation period, training need only be done to accommodate people who are transferring into the command, or who are changing their job assignments within it. This suggests that once some sort of dynamic equilibrium is reached, training would not require enough effort to warrant assignment of a full-time person.

In the beginning, however, when a standard system is being installed, the situation will be like the MME. It will then be important to have a person who knows the system very well devote all his time to the large amount of initial training necessary. This suggests an outsider who already knows the system and is capable of training many new users.

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Once the initial training is done and a core of users have become reasonably adept at using the system, there would be advantages in reducing the trainer's position to a part-time level, dispensing with the outside trainer and having training duties carried out by someone from the user population. It would be less expensive in that there would be no full-time trainer to pay. More important, the part-time military trainer would be better than an outsider at providing functionally oriented training, since he would better understand the work of the command. During the latter stages of the MME we found this sort of training by peers -- those who understand both the system and the jobs to be done -- a very effective component of user training.

Qualifications of a Trainer

The trainer should be very well acquainted with the system. He should be able to answer nearly all the questions about system use without having to look in the documentation, and without having to experiment with the system to see how it reacts in the given circumstances. That level of knowledge builds users' confidence in the trainer. He should be experienced in using man-machine systems so that he understands the difficulties people encounter when they are first exposed to such systems. A data processing background would be helpful for possible insight into how the system works and how difficult it is to modify. Affability is desirable, so that the trainer can build good rapport with the users, both those who are enthusiastic about the system and those who are not. Finally, a military background would be very useful, especially after the training completes its first surge and swings toward solving the problems of using the message handling system to carry out the command's normal tasks. Hence the person responsible for ongoing training should if possible be drawn from the staff of the operating command.

TRAINING COMPONENTS

On-Line Lessons

The on-line lessons were generally well received by those who used them, but some specific changes could have enhanced their value. A common complaint was that they were not interesting enough, or were too wordy. This could be helped by increasing the amount of interaction between the student and the tutor -- that is, requiring shorter stretches of reading interspersed more frequently with actions by the student and responses by the system. Such user-originated actions and the corresponding system reactions could be made integral and necessary to each lesson rather than optional, as in Sigma. This would eliminate the extra complexity of getting from a lesson to an interactive exercise and back. The restriction that all other objects (files and messages, for example) be closed before lesson-taking started could have been simplified by having the message system ask the user if it is all right to close all files and messages so lesson taking could begin. Users felt that procedural information on lesson-taking and the content of the various lessons should be made even more accessible than it was in Sigma, although in fact all they had to do was type the word "Lesson" in the instruction line and push a key labeled "HELP."

The lessons should cover all the system features. In a relatively stable system this should not be a problem; in Sigma, evolving under experimental conditions, not all the new features that were added to the system were covered in the lessons. Finally, the lessons should be sequentially numbered with integers only, so none would be missed because they had identifiers such as 3C.

Documentation

As table 9 has shown, the Sigma documentation was viewed favorably, the order of preference being User's Guide, Primer, and then Reference Manual. This reflects the fact that the User's Guide contained information that helped the user do specific frequent tasks without having to learn much more than he needed. The Primer appealed to people just learning to use Sigma, since it was written in a non-technical style by someone who was herself just learning to use it. The Reference Manual was technical and found use among those who wanted to learn the system thoroughly, or who wondered about specific details of certain instructions.

All these documents played a part in training the users. The MME experience, however, suggests that more effort should have been spent on the Primer at the expense of the Reference Manual. Most of the MME's early effort went into production and maintenance of the Reference Manual, the most technical of the documents, at a time when the users needed less technical and more basic information about such topics as logging on and the appearance of the screen. Once most users had mastered the basics, the most popular document was the functionally-oriented User's Guide. Little could have been done to prepare this guide ahead of time, however, since its preparation required knowledge of the specific system and the user's work requirements.

Peer Training and On-the-Job Training

Users learning by their own use of the system, and by being shown how to use it by fellow workers, played a bigger role in user training than anticipated. As table 9 has shown, this type of training got an unexpectedly favorable rating from those who mentioned it.

In most CINCPAC offices the training by fellow users was supplied very informally -- whenever a user had a question, or whenever someone saw a newer user trying to do something. In at least one office, however, most training of new users was done internally on a fairly formal basis. A senior member of the office (who happened to be an expert user) laid out tasks for the new users to do so they could quickly become proficient in the specialized tasks the office performed. Most of that office's contacts with the experiment staff were funneled through this senior user, who became the center of a little automated message handling community within his own office. Unfortunately he was transferred from CINCPAC at about the time FEU started, and use of Sigma in his office lessened.

Peer training has great potential for new installations, provided that enough users can be trained well enough initially to form a trained cadre that the other new users can use as a resource. This type of training works especially well for training new people who transfer into an office after the system has been established there for some time.

Automated User Aids

Sigma automated user aids took the form of the HELP and PROMPT features described in Section 2. As table 9 shows, typical user reaction to these features was slightly negative, and the interviews indicated that users found them confusing. The PROMPT information was displayed using a formal notation which may have been confusing to many users, few of

whom had any formal data processing background. In addition the PROMPT feature only displayed information about instructions legal in the given situation (with regard to what object was currently being displayed); if the instruction was not legal, some rather cryptic error messages were presented. The feature would have been more useful if the syntactical information on instructions had been presented in something closer to everyday English, and if the system had given a more helpful response when the request for a prompt dealt with an instruction that could not be legally executed at that point in the user's interaction with the system.

The slightly negative opinion on the HELP feature seems more puzzling. It was easy to use; all a user had to do was push the "HELP" key with a blank instruction line to get information on how to use the feature, and then he could read through the information presented. Apparently the mechanism for displaying textual information about the system needed to be made even easier than it was. Some of the negative attitude may have arisen because the information displayed was from the Reference Manual, which itself received a lower rating than other documentation. It may partly have been due to disappointment that the display duplicated, rather than augmented, the written material.

The Introductory Lecture

It certainly seems reasonable that a new user should be given some sort of formal presentation by someone intimately familiar with the system. The disappointingly small positive rating some recipients gave the introductory lecture during interviews, however, indicates that it could have been done more effectively than it was. As described in Section 2, the lecture in the initial stages was given to groups of five or so, and took an hour and a half. There was no user participation -- only the lecturer speaking, showing vugraphs, or giving a demonstration. By the end of the experiment it was found much more effective to have only one attendee at a time, to have an account on the system already set up for him, and to let him have hands-on experience. Perhaps even when many people must be introduced to the system a short lecture (15 minutes or so) could be given to a large group, followed by individual hands-on sessions of an hour or so. This would undoubtedly get new users off to a better start.

ENVIRONMENTAL CONSIDERATIONS

System Stability

Often schedules for installating new systems are far too optimistic. Even if the software is stable, any installation depending on successful operation of a series of interfaces between complex systems may require much time to debug. A message handling system's incoming message flow, for example, moves from the transmitting network through the receiving computer then over a communications link to a possibly different message system computer, and over various communications links to the user's terminals. Any of the links may require multiplexing and demultiplexing equipment, as well as crypto gear. Usually a series of such delicate links requires a long shakedown. In the understandable desire to get started with training, which must necessarily start well ahead of the time a system is to be operational, it is tempting to begin when service may still be unreliable. Unfortunately this can have deleterious long-term effects. Some

users, already apprehensive about learning to use a complex new system, may be easily frustrated by its unexpected misbehavior. During the MME we felt that some users lost confidence in the system for this reason, and a few of them never regained it.

Access to Secure Areas

It is important that the training director have ready access to user spaces where terminals are located, so that he can quickly respond to calls for help and mold the training to fit the type of work he sees going on in individual offices. If having such access requires special clearances for the trainer, the applications should be started far enough in advance to make sure they have been granted by the time they are needed.

A RECOMMENDED TRAINING APPROACH

To be able to specify an effective training approach one should know the circumstances in which the training is to be done. There is no way all circumstances can be foreseen, so it is convenient here to assume a set of typical conditions, and specify for those conditions a training approach that takes into account the experience gained during the MME.

The assumed conditions are: the message handling system being installed will not be greatly modified during its use. The documentation needed, except for functionally oriented material, can be prepared ahead of time. An outside training specialist can be provided for the initial rush of new users, as discussed at the beginning of this section. And there will be no unusual problems in accessing the users or scheduling their training sessions.

Given these conditions, the training can be divided into two phases: an initial training period, during which many users must be rapidly introduced to the system and none of them knows much about it; and a lower-level stable training period, when the only new users are arriving through normal personnel rotation and many of the trained users have become quite knowledgeable about the system. Depending on the number of users and the system's complexity, the first phase might be expected to last for a period of something like three months.

In the initial phase, the first step should be to give a short presentation -- 15 minutes or so -- to large groups of users, as many as can be assembled at once. The presentation should be repeated for those who were unable to attend it the first time. It should provide information of a general nature: background, objectives, and a brief description of the message handling system. The users should be told that accounts have been set up for them on the system and that, as soon as they show up for a private, one-hour-or-so hands-on session with the trainer, they will be given their passwords so that they can use the system. Primer-level documentation should then be distributed, and users should be scheduled for their private one-hour sessions.

At the individual hands-on session the user should be seated at a terminal and shown how to log on. Then he should be shown how to do very simple things, such as read incoming messages. He should be encouraged to issue the necessary instructions himself, the trainer pushing as few keys as possible. During this session the trainer should show the user (by having him execute the proper instructions) whatever features the system has for automated training and

for operational aids. If the system has on-line lessons and/or operational aids, their construction should take into account the experience gained from the MME, in the ways suggested earlier in this section. As part of the hands-on session the user should be told how to get hold of more detailed documentation, such as a Reference Manual, if he cares to. He should also be told that as time goes by he will be given functionally-oriented information prepared by some of his more experienced fellow workers, or perhaps jointly by his fellow workers and the trainer.

In the second phase, when many users know the system fairly well, the emphasis should be on applying average users' skills to the work of their office. The more skillful user or users should be given the job of preparing functionally-oriented documentation to distribute to the rest. Ideally this documentation should be tailored for individual offices. Someone -- perhaps one of those writing the functional documentation -- must be chosen to conduct introductions and one-hour hands-on sessions for the steady trickle of new users.

This training approach is flexible enough to be readily adapted for use at most major military commands, while using the experience gained during the MME. It is not yet clear when a standard message handling system will become ready for use. The validity of the approach, however, should not diminish with the passage of a few years.

APPENDIX A

USER'S GUIDE TO THE MILITARY MESSAGE EXPERIMENT

LOG-ON PROCEDURES

- If machine not ON, turn power ON.
- If machine already ON, press "CNTL" and "RESET" key simultaneously.

-- LOG ON

- LOG ON NAME: Type in office code and press " ↓ " key to move cursor down.
- LOG ON PASSWORD: Type in office code Password and press " ↓ " key to move cursor down.
- SECURITY: Type in highest level of security required.
- IDENTITY: Type in your last name and press " ↓ " key to move cursor down.
- ID PASSWORD: Type in personal password.
- Press "EXECUTE" key (NOTE: News is displayed in bottom window.)
- Press "CLEAR VIEW" key (to remove news).

TO TAKE ON LINE LESSONS

- Make sure the Display area of the screen is blank by pressing "CLEAR VIEW" key and then "FINISH" key until it is.
- Type "LESSON 1" on instruction line.
- Press "EXECUTE" key and press it again when asked to confirm.
- Press "DOWN WINDOW" key to move cursor into lesson field.

- Press "ROLL UP" key to scroll through lesson.
- Type "QUIT" on instruction line when lesson is completed.

NOTE: Appendix 1 lists the contents of each lesson.

TO DISPLAY AND READ FILES

PENDING FILE PROCEDURES *(Messages sent to your office code)*

- If cursor is not on the instruction line, press "UP WINDOW" to move it there.
- Type "DI FI PE" to display pending file.
- Press "EXECUTE" key twice (once after the confirm request). PENDING FILE index will appear on screen.

-- To Review Pending File index:

- Press "DOWN WINDOW" key to move cursor into file index area.
- Press "ROLL UP" key to scroll through file index.

-- To Display each message successively:

- Type "FIND 1" to find the first entry in the file.
- Press "DISPLAY ENTRY" key to display first message.
- Press "ROLL UP" key to scroll through message.
- Press "SHIFT" key and "DISPLAY NEXT" key simultaneously to display next message.
- Press "SHOW FILE" key to return to pending file index display.

NOTE: To show both file index and message on a split screen, press "SHIFT" and "VIEW NEXT" keys simultaneously. File index will remain on screen and message will appear in bottom half of screen. Use the "UP WINDOW" or "DOWN WINDOW" key to move the cursor to the screen you wish to work with.

-- To Display messages selectively:

- Press "ROLL UP" key to scroll through file.
- Press "↓" key to move cursor to desired message.

- Press "HERE" key to mark a particular entry.
- Press "DISPLAY ENTRY" key to display message.
- Press "SHOW FILE" key to return to pending file index display.

NOTE: To show both file index and message on a split screen press "SHIFT" and "VIEW NEXT" keys simultaneously. File index will remain on screen and message will appear in bottom half of screen. Use the "UP WINDOW" or "DOWN WINDOW" key to move the cursor to the screen you wish to work with.

-- To review messages by a selected category:

- To select originator, type "RESTRICT FROM "command name"."
- To select date time group, type "RESTRICT DTG Z DEC78."
- To select for action, type "RESTRICT ACTION "J3"."
- To select something awaiting coordination, type "RESTRICT FOR_CHOP."
- To select a subject, type "RESTRICT SUBJ "actual subject"."

NOTE: Ensure quotation marks are used for restricts on originators, action, and subjects. Ensure for_chop is connected by an underline.

-- After restricting a category of messages press "SHIFT" key and "BACKUP ONE" key simultaneously to display the file that was on the screen before the restriction.

DATEFILE PROCEDURES

- If cursor is not on the instruction line, press "UP WINDOW" key to move it there.
- Type "DI DATEFILE 8 DEC 78."
- Display messages successively, selectively or by selected categories using procedures described for "PENDING FILE."

MYPENDING FILE PROCEDURE (Messages sent to you personally.)

- If cursor is not on the instruction line, press "UP WINDOW" key to move it there.
- Type "DI MY" to display MYPENDING file.
- Press "EXECUTE" key twice. MYPENDING file index will appear on screen.
- Display messages successively, selectively or by selected categories using the procedures described for "PENDING FILE."

NOTE: To show both file index and message on a split screen press "SHIFT" and "VIEW NEXT" keys simultaneously. File index will remain on screen and message will appear in bottom half of screen. Use the "UP WINDOW" or "DOWN WINDOW" key to move the cursor to the screen you wish to work with.

OTHER FILES (Files you created for personal use.)

- Typed "DI FI XXX" to display the file you named XXX.
- Press "EXECUTE" key twice. XXX File will appear on screen.
- Display messages successively, selectively or by selected categories using procedures described for "PENDING FILE."

TO READ THE READBOARDS

READBOARD FILE PROCEDURE

- Type "DI RBI" to display readboard file.
- Press "EXECUTE" key twice (once after the confirm request). Readboard file index will appear on screen.

-- To Review Readboard File Index:

- Press "DOWN WINDOW" to move cursor into file index area.
- Press "ROLL UP" key to scroll through file index.

-- To Display Each Message Successively:

- Type "FIND 1" to find first entry in the file.
- Press "DISPLAY ENTRY" key to display first message.
- Press "ROLL UP" key to scroll through message.
- Press "SHIFT" key and "DISPLAY NEXT" key simultaneously to display next message.
- Press "SHOW FILE" key to display readboard file index.

-- To Display Messages Selectively:

- Press "ROLL UP" key to scroll through file.
- Press "↓" key to move cursor to desired message.

- Press "HERE" key to mark a particular entry.
- Press "DISPLAY ENTRY" key to display message.
- Press "PRINT DISPLAY" key to print message on hard copy printer.
- Press "SHOW FILE" key to return to file.
- Press "ROLL UP" key to continue scrolling through readboard file.

READING THE REMAINING FOUR READBOARDS FILES

- Repeat the steps in the section above, substituting RB2, RB3, RB4, and RB5 successively for RB1.

TO PRINT MESSAGE

-- Use procedure described in *PENDING FILE to display entry.*

-- Press "PRINT DISPLAY" key to print message on printer associated with your terminal.

TO DELETE MESSAGES FROM ANY FILE

SINGLE MESSAGE DELETION

- Press " ↓ " key to move cursor down to message to be deleted.
- Press "HERE" key to mark message.
- Press "DELETE ENTRY" key.

MULTIPLE MESSAGE DELETION

- Press "UP WINDOW" key to move cursor to instruction line.
- Type "DEL EN 2-4" (for example).
- Press "EXECUTE" key, and press it again when asked to confirm.
- If asked to acknowledge for security, press "YES" key.

NOTE: Messages from the date file cannot be deleted.

CREATING A NEW FILE FOR MESSAGES

- Move cursor to instruction line.
- Display file of interest (Pending, MyPending, etc.).
- Type "CR FI XXX SS" (creates a new secret file called XXX).
- Press "EXECUTE" key, and press it again when asked to confirm.
- Type "MOVE EN 5-7 XXX" (This moves the entries and deletes them from the original file.)

  -OR-

  Type "FI EN 5-7 XXX" (This moves the entries without deleting them from the original file.)
- Press "EXECUTE" key, and press it again when asked to confirm.
- If asked to acknowledge for security, press "YES" key.

TO DELETE THE NEW MESSAGE FILE

- Type "DE FI XXX" to delete the new file. This will delete the messages it contains as well.
- Press "EXECUTE" key, and press it again when asked to confirm.

TO USE SIGMA'S ALERT FEATURE

-- TO BUILD AN ALERT_SELECTOR

- Suppose you wish to be alerted when either FLASH precedence messages or messages for chop arrive. The first step is to build a special selector called the Alert_Selector.
- Move the cursor to the instruction line.
- Type "CREATE SELECTOR ALERT_SELECTOR UUUU (Z or FOR_CHOP)."
- Press "EXECUTE" key and press it again when asked to confirm.

  NOTE: Now, whenever a FLASH message, or a message for chop arrives, you will be alerted. You could, of course, have chosen some other set of restrictions a message must meet in order to alert you. To review what these restrictions can be, see the section called (SELECTOR) in the chapter entitled Parameter Descriptions in the Sigma Reference Manual, or Review Lesson 3B.

-- TO PROCESS ALERT MESSAGES

- When a message arrives which satisfies your Alert_Selector, the terminal will emit a "Beep" if you are logged on.

- The next time your Flash line (top line of the screen) is updated (one minute or less) it will contain the entry "ALERT 1." (If the message arriving is the only current Alert message.)

- Press the "ALERT ON/OFF" key to see the Alert List, which contains a citation for the incoming Alert messages as well as those previously received which have not been deleted. This action will bring the Alert List into the View Window, without disturbing the contents of the Display Window. The previous contents of the View Window, if any, are temporarily removed.

  NOTE: The Alert List looks like a file, except that there are no entry numbers.

- Press the "ALERT ON/OFF" key to return the previous contents to the View Window.

  NOTE: If you are not logged on when alert messages arrive, they will not be added to your Alert List and no flash line notification will be given. To see if any Alert messages have arrived since your last LOGON, see the Pending File Duplication section below.

-- TO DISPLAY AN ENTRY IN THE ALERT LIST

- Using the cursor control keys, move the cursor to the message you wish to display.

- Press the "HERE" key.

- Press the "DISPLAY ENTRY" key.

  NOTE: The Alert message should appear in the Display Window.

-- TO HOUSEKEEP THE ALERT LIST

NOTE: When an Alert message arrives, it is put at the bottom of the Alert List, even if you are viewing the list. There is only room for 10 entries in the Alert List. If an eleventh entry arrives, it will be put at the bottom, and the top entry will be removed in a minute or two.

- Type "RESET ALERT" to remove the entries from the Alert List.

- Press "EXECUTE" and confirm again when asked. The entries are deleted from the Alert List, and the Alert Count is removed from the Flash Line.

-- TO MODIFY THE ALERT_SELECTOR

- Type "DEL SEL ALERT_SELECTOR" to delete current Alert_Selector.
- Press "EXECUTE" key and press again when asked to confirm.
- Then create a new Alert_Selector as described above.

  NOTE: You may override your present Alert_Selector by creating one as outlined above, and acknowledging "YES" when Sigma asks you if you want to overwrite the old one.

OTHER THINGS YOU MAY DO TO ENTRIES IN THE ALERT LIST

- You may also execute the function keys "VIEW ENTRY", "COPY ENTRY", "REPLY ENTRY", and "PRINT ENTRY", by pressing the "HERE" key and then using one of the above commands.

  NOTE: Viewing will replace the Alert List with the message viewed.

- Press "ALERT ON/OFF" key to get the Alert List back.

PENDING FILE DUPLICATION

NOTE: These incoming messages also go to your Pending File, as they always have. If you are afraid that some Alert messages may have been cleared from your Alert List before you saw them (either because the list got too long, or because it was reset) or you were not logged on when the Alert message arrived, you can still see the messages in your Pending File.

-- TO DISPLAY ALL ALERT MESSAGES IN THE PENDING FILE

- Type "DI FI PE."
- Press "EXECUTE" key and press again when asked to confirm.
- Type "RESTRICT WITH ALERT_SELECTOR" to get all Alert messages that have not been deleted from your Pending File.
- Press "EXECUTE" key and press again when asked to confirm.

  NOTE: New messages coming into your Pending File will be automatically added to the end of the file; it is no longer necessary to "FINISH" the file and redisplay it.

- Hold the "SHIFT" key down and press "BACKUP ONE" to return to normal.

-- TO DISPLAY ALL ALERT MESSAGES SINCE LAST LOG-ON

- Type "DI FI PE."
- Type "RESTRICT RECENT."
- Press "EXECUTE" key and press again when asked to confirm.
- If there are any recent entries, type "RESTRICT WITH ALERT_SELECTOR" to get all Alert messages that have arrived since your last LOGON.
- Press "EXECUTE" key and press again when asked to confirm.
- To return to the pending file, type "BACKUP ALL."
- Press "EXECUTE" key and press again when asked to confirm.

TO CREATE AND RELEASE AN INFORMAL NOTE

-- CREATING NOTES

- Type "CREATE NOTE UU" in the instruction line (if the note is classified, type in "CC" or "SS" for Confidential or Secret).
- Format will appear on screen.
- Press " ↓ " key to move the cursor to the "TO" line.
- Type in the individual's name or the office code that you wish to send the note to.
- Press " ↓ " key to move the cursor to the "CC" line.
- Type in the individual's name or the office code(s) that you wish to send copies of the note to.
- Press " ↓ " key to move the cursor to the "subject" line.
- Type in the subject.
- Press " ↓ " key to move the cursor to the "reference" line.
- Type in references.
- Press " ↓ " key to move the cursor to the 'Text" line. Press the "RETURN" key twice to move cursor down two lines.

- Type in text. (To insure that the format of the text remains the same when a hard copy is printed, you must double space; press the "RETURN" key twice between each paragraph or indent a space from the left hand margin.)

- To release the note, hold the "SHIFT" key down and press the "RELEASE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay office codes or names that are entered in the "TO" and "CC" lines.

- If you are happy with Sigma's interpretation of the office codes and names in those lines, press the "YES" key.

- If you are not happy with Sigma's interpretation of the office codes or names, press the "NO" key, correct the office code or name, and repeat the "RELEASE MESSAGE" steps.

TO DRAFT A MEMO OR MESSAGE AND SEND IT FOR CHOP

-- TO CREATE THE MEMO OR MESSAGE

- Type "CR MES MEMO UU" on the instruction line for a memo. (If the memo is classified, type CC or SS.)

OR

Type "CR MES AUTODIN UU" on the instruction line for a message. (If the message is classified, type CC or SS.)

- Press "EXECUTE" key and press it again if asked to confirm.

- A partially filled-in template will appear on the screen.

-- TO DRAFT THE MEMO OR MESSAGE

NOTE: If you need to leave the terminal prior to completing the draft, press "FINISH" key. A citation to the draft will appear later in the pending file.

- If necessary, press the "↓" key to move the cursor to the "BRIEFING MEMO" line.

- Type in this field any information you want to pass to those who will chop or release this action. Things you type here will accompany action only up to the point where it is released.

- *If it is a message, press the "↓" key to move the cursor to the* "PRECEDENCE" line. If you wish, you may edit this line with the "DEL" keys and the letter keys.

- Press the "↓" key to move the cursor to the "TO" line.

- If you are drafting a memo, type in the names of the individual(s) or office(s) that you wish to send the memo to (for example, J31 J34 ISHII).

- If you are preparing a message, type in the addressees. To open new lines, press the "RETURN" key.

- Press the " ↓ " key to move the cursor to the "INFO" line.

- Type in the names of office(s) or individual(s) (or addressees for a message) you wish to receive info copies of the memo or message.

- If it is a message, Press the " ↓ " key to move the cursor to the "EXEMPT" line.

- Type any addressees you want to exempt from any AIG's you may have used above.

- Press the " ↓ " key to move the cursor to the "CLASSIFICATION" line.

- NOTE: The left-hand portion of this field (the classification) is not editable. However, you may insert material in the right-hand portion which will appear as part of the Classification Line. You may type E F T O (E-space-F-space-T-space-O) for EFTO messages, if the message is Unclas EFTO. You may also type things like J34/ /J341 to indicate who at CINCPAC prepared the message.

- Press the " ↓ " key to move the cursor to the "SUBJECT" line.

- Type in the subject of the memo or message.

- Press the " ↓ " key to move the cursor to the "REFERENCE" line.

- Type in the references. You may use the "RETURN" key to create new lines for additional references.

-- TO FILL IN THE TEXT FIELD

- Press the " ↓ " key to move the cursor to the "TEXT" line.

- Type in text. (To insure that the format of the text you enter remains unchanged, either indent each new line one space from the left-hand margin, or double space between each line.)

- Press the "UPDATE" key to insure your text format is correct before leaving the text field.

- If it is a message, press the " ↓ " key to move the cursor to the Downgrade Instruction Line. Enter the proper downgrading, if required.

- If it is a message, temporarily skip the "CHOP" and "RELEASE" lines and go to the "ORIGINATING OFFICE" line. This line will have J3 entered in it, but you may change it to either DDO or JRC.

- Press the " ↓ " key to move the cursor to the "DISTRIBUTION" line. Type the list of office codes you wish to receive back copies when the message is released. You need not enter the office code you are logged in under.

-- TO SEND THE DRAFT TO THE FIRST CHOPPERS

- Press the " ↓ " key to move the cursor to the "CHOP" line.

- Enter the names of the offices or individuals that you wish to CHOP on your memo or message (for example, J341 J34 MILLER). You may also enter the office code you wish to release your message in the "RELEASE" line.

- Use the cursor control keys to move the cursor beneath a name or office code in the "CHOP" or "RELEASE" lines that you wish to get a copy for chop on the first round of coordination. Press the "HERE" key to make a mark on that name or office code. Repeat this for each name or office code you wish to receive a copy of the first round.

  NOTE: If you do not mark the name or office code, the addressee will not get a copy for chop or for release when you press the "COORDINATE MESSAGE" key.

- Hold the "SHIFT" key down and press the "COORDINATE MESSAGE" key. A request to acknowledge YES or NO should appear. Sigma will redisplay the names of offices or individuals that you have marked in the "CHOP" and "RELEASE" lines. If it recognizes them, it will highlight them. If not, it will add an asterisk to them.

- If you are happy with Sigma's interpretation of the addressees in the "CHOP" and "RELEASE" lines (and in the "TO" and "INFO" lines if it is a memo), press the "YES" key. Otherwise, press the "NO" key, correct the addresses and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

- For_Chop and For_Release citations for the message will be delivered to the MyPending Files for those users whose names or the Pending File for those office codes you marked in the "CHOP" and "RELEASE" line respectively.

TO CHOP ON A MEMO OR A MESSAGE

-- MEMO/MESSAGE SELECTION PROCESS

- Display your Pending or MyPending Files using the procedures described above.

- Type "RESTRICT FOR_CHOP" on the instruction line.

- Press "EXECUTE" key and press again when asked to confirm.

NOTE: If you have no memos or messages for chop, you will be told that "Your selector returned no entries." The rest of these instructions apply only if you do have entries.

- To display the first memo or message sent to you for chop, hold the "SHIFT" key down and press the "DISPLAY NEXT" key. A memo or message should appear on the screen. You may scroll through the various parts of the message by pressing the "ROLL UP" or "ROLL DOWN" keys as needed.

-- TO SEE THE WORK OF OTHER CHOPPERS

- You may, if you like, see what other choppers have had to say about the message so far. To do this, examine the "CHOP" field of the office that sent you the message. If any chopper's status is 'CHOPPED YES" or "CHOPPED NO", you may examine the changes they have made.

- Type "VIEW VERSION (Chopper's Code)" in the instruction line (J341, for example).

- Press 'EXECUTE" key and press again when asked to confirm.

NOTE: His version will appear in the View Window, and you can scroll it to compare it with the version sent to you. You will only see his comments if he made them accessible to you.

-- TO PUT COMMENTS ON THE MEMO OR MESSAGE

- If you wish to make a comment on some part of your version of the message (in the Display Window), move the cursor to the area where you want the comment to go.

- Press the "HERE" key.

- Move the cursor to the instruction line. Type "COMMENT" (access specification)", where Access Specification is "PUBLIC" if you wish everyone to see the comment, "PRIVATE" if you wish no one but those who log on under your office code to see it, or "J341" if, for example, you wished only your office code and J341 to be able to see it.

- Press "EXECUTE" key and press again when asked to confirm.

- Move the cursor to the comment field now displayed on your version of the memo or message, and type in your comment. You may use more than one line if necessary. It is not necessary to press the "EXECUTE" key to have this comment recorded.

NOTE: These comments are viewable by others (including the one who sent it to you for chop) only if they do a View Version instruction for your version and if you chose to make the comments accessible to them. The comments become available as soon as you do a "FINISH" or a "CHOP YES/NO."

-- TO EDIT YOUR VERSION OF THE MEMO OR MESSAGE

- Instead of, or in addition to, putting comments on the memo or message, you may edit your version. This editing may be done in most message fields (Sigma will refuse editing in protected fields).

  Move the cursor to the field you wish to edit. Use the two delete keys (not the "DELETE ENTRY" function key above) for character deletion. Use the typewriter keys to insert new characters. For more powerful editing features, review Lesson 5C.

- If you decide not to keep the editing you have done, type "ABORT" in the instruction line. Press "EXECUTE" key and press again when asked to confirm.

- The editing you have done becomes a permanent part of your version if you press the "FINISH" key or if you press the CHOP YES/NO" keys (see below).

-- TO CHOP YES OR NO ON THE MEMO OR MESSAGE

- To chop no, press the "CHOP NO" key.

- To chop yes, press the "CHOP YES" key.

NOTE: When you chop on a memo or message, it will disappear from your screen. A citation showing how you have chopped will be sent to the person who sent the memo or message to you for chop. He will be able to see that you have edited the draft and your comments, if you made them accessible to him, by doing a View Version with your user ID.

-- TO SEND THE MEMO OR MESSAGE ON FOR FURTHER COORDINATION

- You may, if you choose, send the message on to someone else for coordination or for release. To do this, enter his office code in the "CHOP" line or the "RELEASE" line, whichever is appropriate. Do this for all users you wish to get copies for chop or release.

- Move the cursor beneath each office code you have entered that you wish to get copies the next time you press the "COORDINATE MESSAGE" key. Mark the name by pressing the "HERE" key. Each name or office code so marked will get a copy when you execute the "COORDINATE MESSAGE" instruction, and those not marked will not get copies.

- Hold the "SHIFT" key down and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay the names of offices or people that you have marked in the "CHOP" and "RELEASE" lines. If it recognizes them, it will highlight them. If not, it will add an asterisk to them.

- If you are happy with Sigma's interpretation of the addressees in the "CHOP" and "RELEASE" lines (and in the "TO" and "INFO" lines, if it is a memo), press the "YES" key. Otherwise, press the "NO" key, correct the addressees and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

- For_Chop and For_Release citations for the messages will be delivered to the My-Pending Files of whose users whose names or the Pending File for whose office codes you marked in the "CHOP" and "RELEASE" lines, respectively.

- In effect, you have created another round of coordination in which you are the originator, and the names you inserted are the choppers. When they chop yes or no, notification will come to you.

- This second round of coordination may be initiated whether or not you have chopped on the message yourself.

TO HANDLE A CHOPPED MEMO OR MESSAGE

-- TO CHECK TO SEE IF YOU HAVE INCOMING "CHOPPED" MEMOS OR MESSAGES

- Type "DI FI PE" to display pending file or "DI FI MYP" to display MyPending File.

- Press "EXECUTE" key and press again when asked to confirm.

- Type "RESTRICT CHOPPED" in the instruction line.

- Press "EXECUTE" key and press again when asked to confirm.

  NOTE: If you have no chopped memos or messages, you will be told that "Your selector returned no entries."

  NOTE: The citation for the chopped memo or message will indicate who the chop is from and whether he chopped "YES" or "NO."

  To display the first chopped memo or message, hold the "SHIFT" key down and press the "DISPLAY NEXT" key. A memo or message should appear on the screen in the Display Window. Note that this is your version of the memo or message, not the chopper's.

-- TO VIEW THE WORK OF THE CHOPPER

- Type "VIEW VERSION (Chopper)" in the instruction line, where (Chopper) is the office code that chopped on the memo or message (J341, for example).

- Press "EXECUTE" key and press again when asked to confirm.

NOTE: The chopper's version of the memo or message will appear in the View Window. If the chopper has either changed the text in his version, or has added a comment to the memo or message, the first line of his version will contain the highlighted word EDITED. If that word does not appear, it means that the chopper neither changed his text nor added a comment. Of course, even if he did add a comment, he may not have made it accessible to you.

- You may compare the chopper's version with your own version by scrolling the Display Window (containing your version) and the View Window (containing the chopper's version) separately. There is no easy way of finding the differences in the versions.

-- TO MODIFY YOUR VERSION

- You may wish to modify your version of the memo or message to reflect the editing or comments done by the chopper.

- One way of editing is by using the two "DEL" keys (not the "DELETE ENTRY" function key) to remove old characters, and using the typewriter keyboard to insert new ones. For more powerful editing features, review Lesson 5C.

  NOTE: If you wish to copy large blocks of text from the chopper's version into your version, you may find it helpful to use the "COPY TEXT" instruction. The next few steps discuss "COPY TEXT."

- Move the cursor to the beginning of the text in the View Window that you wish to copy.

- Press the "HERE" key.

- Move the cursor to the end of the block of text you wish to copy. You may have to use the "ROLL UP" key to do this.

- Press the "HERE" key.

- Move the cursor to the location in the Display Window where you wish the block of text to be inserted.

- Hold the "SHIFT" key down and press the "COPY TEXT" key.

-- TO SEND THE MEMO OR MESSAGE FOR FURTHER COORDINATION

NOTE: After you have incorporated changes from several choppers into your version of the memo or message, you may wish to distribute it for further coordination.

- To do this, examine the Chop Line in your version. Enter any office codes you need that are not already there.

- Move the cursor beneath each office code you have entered that you wish to get copies the next time you press the "COORDINATE MESSAGE" key. Mark the name by pressing the "HERE" key. Each name or office code so marked will get a copy when you execute the "COORDINATE MESSAGE" instruction.

- Hold the "SHIFT" key down and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay the names of offices or people that you have marked in the "CHOP" line. If it recognizes them, it will highlight them. If not, it will add an asterisk to them.

- If you are happy with Sigma's interpretation of the addressees in the "CHOP" line (and in the "TO" and "INFO" lines if it is a memo), press the "YES" key. Otherwise, press the "NO" key, correct the addressees and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

  NOTE: *For_Chop* citations will be delivered to the Pending Files of those users whose office codes you marked in the "Chop" line.

-- TO SEND THE MEMO OR MESSAGE ON FOR RELEASE

NOTE: When you think the memo or message is ready to be sent to the person you think should release it, make sure that his office code is entered in the "RELEASE" line of your version.

- Move the cursor to the "RELEASE" line, and place it beneath the office code of the releaser.

- Press the "HERE" key.

- Hold the "SHIFT" key down and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. If Sigma recognizes the office code you marked, it will highlight it. If not, it will add an asterisk to it.

- If you are happy with Sigma's interpretation of the Releaser office code, press the "YES" key. Otherwise, press the "NO" key, correct the office code, and repeat the "HERE" marking and "COORDINATE MESSAGE" steps.

  NOTE: A For_Release citation will be delivered to the Pending File of the Releaser. He may release the memo or message, or he may chop No on it just as though he were a chopper.

- When your message is released, your version of it will say so. Look for the word "PREPARATION" near the beginning of the version to be replaced by the "TRANSMITTED."

- If instead of Release, the releaser chops No, you will receive a chopped citation which you can handle by the procedures outlined above.

TO PROCESS A MEMO OR MESSAGE SENT TO YOU FOR RELEASE

-- TO CHECK TO SEE IF YOU HAVE INCOMING MEMOS OR MESSAGES FOR RELEASE

- Type "DI FI PE" to display Pending File.
- Press "EXECUTE" key and press again when asked to confirm.

  NOTE: If you have no memos or messages for release, you will be told that "Your selector returned no entries."

- To display the first memo or message sent to you for release, hold the "SHIFT" key down and press the "DISPLAY NEXT" key. A memo or message should appear on the screen. You may scroll through the various parts of the message by pressing the "ROLL UP" or "ROLL DOWN" keys as needed.

-- TO RELEASE THE MEMO OR MESSAGE

- Before you release the memo or message, you may wish to modify it. You may do this by using the two "DEL" keys (not the "DELETE ENTRY" function key) to remove unwanted characters, and using the typewriter keyboard to insert new characters. For more powerful editing features, review Lesson 5C.
- To release the memo or message, hold the "SHIFT" key down, and press the "RELEASE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay office codes that are entered in the "Distribution" or "Originating Office" lines if it is a message; and in the "TO" and "INFO" lines if it is a memo.
- If you are happy with Sigma's interpretation of the office codes in those lines, press the "YES" key. If you have release authority, the memo or message will be released. If you do not have release authority, an error message will appear.
- If you are not happy with Sigma's interpretation of the office codes, press the "NO" key, correct the office codes, and repeat the "RELEASE MESSAGE" steps.

-- TO CHOP NO ON THE MEMO OR MESSAGE

NOTE: If you do not wish to release the message, you may wish to return it to the person who sent it to you with a Chop No indication.

- Before chopping NO, you may wish to edit the memo or message. If so, use the techniques described above in the section on Releasing.
- You may wish to put a comment on the memo or message that the person who sent it to you for release can see. If so, put the cursor in the area of the message you wish to comment on.

- Press the "HERE" key.

- Move the cursor to the instruction line and type "COMMENT (Access Specification)", where Access Specification is "PUBLIC (if you wish everyone to be able to see the comment); or the office code that sent you the memo or message for release (if you wish only the two of you to be able to see it).

- Press "EXECUTE" key and press it again when asked to confirm.

- Move the cursor to the comment field now displayed on your version of the memo or message and type in your comment.

- Press the "CHOP NO" key. The person who sent you the memo or message for release will receive a citation showing him that you chopped no on it.

TO READDRESS A MESSAGE

-- TO SELECT THE MESSAGE TO BE ADDRESSED

NOTE: Normally you will be going through a file and reading messages when you discover one that should be readdressed.

- If the message you wish to readdress is in the Display Window, move the cursor to the instruction line and type "READDRESS MESSAGE." Press the "EXECUTE" key and press again when asked to confirm.

- If instead you have a file in the Display Window and see a citation to the message you wish to readdress, move the cursor to the desired message and press the "HERE" key. Then press "READDRESS ENTRY" key.

NOTE: In either case, a readdressal template, with most of the message fields completed, will appear in the Display Window.

-- TO FILL IN THE READDRESSAL TEMPLATE

- If necessary, press the " ↓ " key to move the cursor to the "BRIEFING MEMO" line.

- Type in this field any information you want to pass to those who will receive this message.

- Press the " ↓ " key to move the cursor to the "PRECEDENCE" line. If you wish, you may edit this line with the "DEL" key and the letter keys.

- Press the " ↓ " key to the move the cursor to the "FROM" line. If you wish, you may edit this line with the "DEL" key and the letter keys.

- Press the " ↓ " key to move the cursor to the "TO" line.
- Type in the addressees. To open new lines, press the "RETURN" key.
- Press the " ↓ " key to move the cursor to the "INFO" line.
- Type in the addressees whom you wish to receive info copies of the message.
- Press the " ↓ " key to move the cursor to the "EXEMPT" line. Type here any addressees you want to exempt from any AIG's you may have used above.
- Temporarily skip the "CHOP" and "RELEASE" lines and go to the "ORIGINATING OFFICE" and "DISTRIBUTION" lines.
- Press the " ↓ " key to move the cursor to the "ORIGINATING OFFICE" line. This line will have J3 entered in it, but you may change it to either DDO or JRC.
- Press the " ↓ " key to move the cursor to the "DISTRIBUTION" line.
- Type the list of office codes you wish to receive back copies when the message is released. You need not enter the office code you are logged in under.

-- TO SEND THE DRAFT TO THE FIRST CHOPPERS

- Press the " ↓ " key to move the cursor to the "CHOP" line.
- Enter the names of the offices or individuals that you wish to chop on your readdressal (for example, J341 J34 MILLER). You may also enter the office code you wish to release your readdressal in the "RELEASE" line.
- Use the cursor control keys to move the cursor beneath a name or office code in the "CHOP" or "RELEASE" lines that you wish to get a copy for chop on the first round of coordination. Press the "HERE" key to make a mark on that name or office code. Repeat this for each name or office code you wish to receive a chop on the first round.

  NOTE: If you do not mark the names or office codes, they will not get a copy for chop or for release when you press the "COORDINATE MESSAGE" key.
- Hold the "SHIFT" key down and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay the names of offices or individuals that you have marked in the "CHOP" and "RELEASE" lines. If it recognizes them, it will highlight them. If not, it will add an asterisk to them.
- If you are happy with Sigma's interpretation of the addressees in the "CHOP" and "RELEASE" lines, press the "YES" key Otherwise, press the "NO" key, correct the addressees and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

- For_Chop and For_Release citations for the message will be delivered to the Pending Files of those users whose names or office codes you marked in the "CHOP" and "RELEASE" lines, respectively.

-- TO RELEASE THE READDRESSAL

- Hold the "SHIFT" key down and press the "RELEASE MESSAGE" key. A request to acknowledge Yes or No should appear.

- Press the "YES" key. If you have Autodin message release authority, the message will be released.

LOG-OFF PROCEDURES

- Press "UP WINDOW" to move the cursor to Instruction Line.

- Type "L."

- Press "EXECUTE" key and press it again when asked to confirm. This will clear the terminal for the next user.

APPENDIX B

MILITARY MESSAGE EXPERIMENT (MME)
Limited Experimental Use

Milestones

The following milestones are designed to provide MME participants with a sequence of functions that will help prepare them for the Military Message Experiment. Each participant is required to receive an introductory lecture and complete a series of seven lessons that are available on the MME.

J31, J32, J33, J34 Divisions

1. Milestones

   a. Display Pending File

      (1) !Display Next Entry!
      (2) !Delete Entry!
      (3) !Display Entry!
      (4) !Show File!
      (5) Scroll through Pending File
      (6) Delete Entry 1-20 or so (leave some entries in file)
      (7) !Delete Next Entry!
      (8) !Print Entry!/!Print Next Entry!
      (9) Forward Entry J30A

   b. Create File _____ SSS

   c. Display Pending File

      (1) Move Next Entry _____. (File created 1b.)
      (2) !Delete Entry!

   d. Display MYPENDING File

      (1) !Display Next Entry!

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e. Display DATEFILE SEP 78

(1) Restrict SEL SUBJ "PORT VISIT"
(2) Create File Port_Visit
(3) !File Directory!
(4) FILE - PORT_VISIT
(5) !BACKUP ONE!
(6) Restrict SELECTION ACTION "J3"
(7) Forward Entry 3____ (to another Division)
(8) Display FILE PORT_VISIT
(9) Delete FILE PORT_VISIT

f. Display DATEFILE____SEP 78

(1) Restrict UNCLAS
(2) Restrict O (IMMEDIATE) (NOTE: USE LETTER "O" NOT ZERO)
(3) Create Selector U_O
(4) !Selector Directory!
(5) Backup All
(6) Restrict with U_O

g. Create Message Note UU

(1) To: ISHII
CC: MILLER, J31, J32, J33, J34
SUBJ: USER COMMENTS
TEXT:

(a) Report problems related to using the MME system.

(2) !Release Message!
(3) !Release Message! (If necessary)

h. Create Message Memo SSSS

(1) TO: J30
CC: J31, J32, J33, J34
SUBJ: TEST MEMO
TEXT: (Enter Text)

CHOP: Enter appropriate CHOP List:

- Include J34, MILLER in Chop List.
- Print copy for coordination with divisions without MME terminals.
- !COORDINATE MESSAGE! (Twice if necessary)

(Within a few days a chopped version of the memo should appear in your pending file.)

(2) TO: J3
CC: J30, J31, J32, J33
SUBJ: TEST MEMO
TEXT: (Enter Text)

CHOP: Enter appropriate chop list:

- Include J34, MILLER in Chop List.
- Print copy for coordination with divisions without MME terminals.
- !COORDINATE MESSAGE! (Twice if necessary)

2. Create Message AUTODIN SSSS

a. For Release by J30

(1) TO: CINCPAC HONOLULU HI
SUBJ: TEST MESSAGE
TEXT: (Enter Text)
CHOP: Enter appropriate chop list:

- Include J34, MILLER in Chop List.
- !COORDINATE MESSAGE! (Twice if necessary)

b. For Release by J3

(1) TO: CINCPAC HONOLULU HI
SUBJ: TEST MESSAGE
TEXT: (Enter Text)
CHOP: Enter appropriate chop list:

- Include J34, MILLER in Chop List.
- Print copy for coordination with divisions without MME terminals. (J35, J36)
- !COORDINATE MESSAGE! (Twice if necessary)

3. Coordination (Choppers)

a. Display Pending File
b. Restrict For_Chop
c. Display appropriate entry

d. !Chop Yes!
e. !Display Next Entry!
f. Comment PUBLIC/!CHOP NO!

4. Draft Modification (Originator)

a. Display Pending File
b. RESTRICT CHOPPED
c. Display the Entry
d. View Version _____ (Enter the office code that chopped the message. For example, if J32 and J33 chopped the instruction would be View Version J32.)
e. Edit draft in display window as necessary. (Draft in display window is your original draft.)
f. Scroll viewed version to chopper's new paragraph. Put HERE marks before and after new paragraph. Put cursor in text field of your original draft (display window).
g. !COPY TEXT!

5. Coordination of Modified Version (Originator)

a. Enter appropriate chop list. (If there is an office code that has chopped previously but is not required to chop the modified version enter a "C" before their office code. SIGMA will not recognize that code and a copy will not be sent for coordination, i.e., CJ33. This procedure will eliminate unnecessary copies being coordinated and also indicates that the office chopped on the message previously.

6. Re-coordination of Draft Modification (Choppers)

a. Display Pending File
b. Restrict FOR_CHOP
c. !Display Next Entry!
d. !CHOP YES!

7. Final Version to J30 (Originator)

a. Display Pending File
b. RESTRICT Chopped
c. !Display Next Entry!
d. Add J30, ISHII, MILLER, MCKEE to chop list
e. Type a "C" before all office codes that have chopped the message. (Include divisions that were coordinated with by using the printed copy, i.e., CJ31, CJ32, CJ33, CJ34, CJ35, CJ36, J30, ISHII, MILLER, MCKEE.)

f. !COORDINATE MESSAGE! (Twice if necessary)

8. After MILLER and MCKEE receive the final version of the message in their MYPENDING FILE, they will create a memo and coordinate it with you for chop. You can chop by:

a. Display Pending File
b. Restrict For_Chop
c. !Display Next Entry!
d. !Chop Yes!
e. !Display Next Entry!
f. Comment PUBLIC/!Chop No!

9. Create Text AAA UUU

a. Type in text:

MEMORANDUM
FROM:
TO:
SUBJ:
REF:
ENCL: (1)
(2)

1. THIS IS A TEST.

b. Put HERE marks around text.

HERE THIS IS A TEST HERE

c. Move cursor to SUBJ: line.
d. !COPY TEXT!
e. !FINISH!
f. !TEXT DIRECTORY!

J30A

1. Functions.

a. Display PENDING FILE

(1) !Display Next Entry!
(2) Comment Public on MESSAGE
(3) FORWARD message J30
(4) DELETE all others:

(a) DELETE ENTRY 1-_ (Next to last entry)
(b) !Delete Next!

2. Create Message Note UU.

   a. TO: J30
      CC: J3, J34, MILLER
      SUBJ: USER Comments
      TEXT:

      (1) Report problems related to using the MME system.

   b. TO: _____ (Division Chief)
      CC: J30, J34, MILLER
      SUBJ:
      TEXT:

3. Readboard.

   a. DISPLAY RBI
   b. DISPLAY RBII
   c. DISPLAY RBIII
   d. DISPLAY RBIV
   e. DISPLAY RBV

4. Display File TODAY

5. Display DATEFILE___SEP 78

   a. Restrict by "Subj", "From", or DTG

6. Print appropriate messages for J30

J30

1. MEMO for J30

   a. Chop YES

      (1) Display Pending File
      (2) !RESTRICT FOR_CHOP!
      (3) !Display Next Entry!
      (4) !Release Message! (Twice if necessary)

2. MEMO for J3

   a. CHOP YES

      (1) Display Pending File
      (2) !Restrict For_Chop!
      (3) !Display Next Entry!

(4) Add J3 in Chop Line. Type "C" in front of all office codes in Chop Line. (i.e., CJ31, CJ30, J3)
(5) !Coordinate Message! (Twice if necessary)

3. Message for J30 Release

a. Chop YES

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) !Release Message! (Twice if necessary)

b. Chop NO

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) Put HERE in text field
(5) Comment PUBLIC
(6) !Chop NO!

4. Message for J3 Release

a. Chop YES

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) Add J3 in Chop Line. Type "C" in front of all office codes in Chop Line. (i.e., CJ30, J3)
(5) !Coordinate Message! (Twice if necessary)

b. Chop NO

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) Put HERE in text field
(5) Comment PUBLIC
(6) !Chop NO!

5. Re-Chop Message for J3 Release

a. Chop YES

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!

(4) Add J3 in Chop Line. Type "C" in front of all office codes in Chop Line. (i.e., CJ30, J3)
(5) !Coordinat` Message! (Twice if necessary)

6. Display Pending File

a. !Display Next Entry!
b. Comment PUBLIC on Message
c. Forward Message J3
d. Delete all others

(1) Delete Entry 1-_ (Next to last entry)
(2) !Delete Next!

7. Create Message Note UUU

a. To J3

(1) File In Text

TO: J3
CC: J30A, J34, MILLER
SUBJ:
TEXT:

(2) !Release Message! (Twice if necessary)

8. Readboard

a. Display RBI

J3

1. MEMO for J3 Release

a. Chop YES

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) !Release Message! (Twice if necessary)

2. Message for J3 Release

a. Chop YES

(1) Display Pending File
(2) Restrict For_Chop

(3) !Display Next Entry!
(4) !Release Message! (Twice if necessary)

b. Chop NO

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) Comment Public
(5) !Chop No!

3. Re-Chop Message For J3 Release

a. Chop YES

(1) Display Pending File
(2) Restrict For_Chop
(3) !Display Next Entry!
(4) !Release Message! (Twice if necessary)

4. Create Message Note UUU

a. TO: J30
CC: J34, J30A
SUBJ:
TEXT:

!Release! (Twice if necessary)

5. Readboard

a. Display RBI

6. Review Pending File

a. Display Pending File
b. !Display Next Entry!
c. !Delete Entry!

APPENDIX C

OUTGOING MESSAGE GUIDE

DRAFTING A MESSAGE AND SENDING IT FOR CHOP

PURPOSE: TO OUTLINE THE PROCEDURES FOR CREATING A MESSAGE AND STARTING IT ON THE CHOP PROCESS.

CREATING THE MESSAGE

* Type CR MES AUTODIN UU in the instruction line. (If it is classified, type CC or SS instead of UU)

* Press the "EXECUTE" key, and press it again if asked to confirm.

* A partially filled in message form will appear on the screen.

DRAFTING THE MESSAGE

* If necessary, press the " ↓ " key to move the cursor to the "Briefing Memo" line. Type in this field any information you want to pass to those who will chop or release this draft. If you need to enter more than one line, just keep typing; the field will automatically expand. Things you type here will NOT accompany the message when it is released, but will accompany the message during the chop cycle.

* Press the " ↓ " key to move the cursor to the "Precedence" line. If you wish, you may edit this line with the "DEL" keys and the keyboard.

* Press the " ↓ " key to move the cursor to the "To" line. Type in the addressees. To open new lines, press the "RETURN" key. Put only one addressee on each line.

* Press the " ↓ " key to move the cursor to the "Info" line. Type in the addressees whom you wish to receive info copies of the message. Again, put only one addressee on each line.

* Press the " ↓ " key to move the cursor to the "Exempt" line. Type here any addressees you want to exempt from any AIG's you may have used in the "To" or "Info" lines.

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* Press the " ↓ " key to move the cursor to the line with the security classification. The left-hand portion of this field (the classification) should not be edited. However, you may insert material in the right-hand portion which will appear as part of the Classification line. You may type E F T O (E-space-F-space-T-space-O) for EFTO messages, if the message is to be Unclass EFTO. You may also type things like // J34// J3, to indicate who at CINCPAC prepared and released the message.

* Press the " ↓ " key to move the cursor to the "subject" line. Type in the subject of the message.

* Press the " ↓ " key to move the cursor to the "References" line. Type in the references. You may use the "RETURN" key to create new lines for additional references.

FILLING IN THE TEXT FIELD

* Press the " ↓ " key to move the cursor to the "Text" field. Type in the text. If you wish to have Sigma format your text after you have entered it, put "HERE" marks before and after the text you wish to have formatted, and press the "UPDATE" key. To format all the text, press the "UPDATE" key without any "HERE" marks.

* Press the " ↓ " key to move the cursor to the "Downgrade Instructions" line. If you wish, you may edit this line with the "DEL" keys and the letter and number keys.

* Press the " ↓ " key to move the cursor to the "Originating Office" line. This line will have J3 entered in it, but you may change it to either DDO or JRC.

* Press the " ↓ " key to move the cursor to the "Distribution" line. Type in this line the list of office codes you wish to receive back copies when the message is released, including your own if you wish to receive a copy.

SENDING THE DRAFT TO THE FIRST CHOPPERS

* Use the cursor control keys to move the cursor to the "Chop" line. Enter the names of the offices and people that you wish to chop on your message (for example, J342 J34 MILLER JONES). You may also enter the office code you wish to release your message in the "Release" line. These names need not be users of the system, but of course the system cannot deliver copies to those that are not users.

* Use the cursor control keys to move the cursor to a name or office code in the "Chop" or "Release" lines that you wish to get a copy for chop on the first round of coordination. Press the "HERE" key to make a mark on that name or office code. Repeat this for each name or office code you wish to receive a copy on the first round. NOTE: If you do not mark the names or office codes, they will not get a copy for chop or for release when you press the "COORDINATE MESSAGE" key.

* Hold down the "SHIFT" key and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay the names of offices or people in the "Chop" and "Release" lines. If it recognizes them, it will highlight those that you marked. If not, it will add an asterisk to them. You may wish to print copies for these people to coordinate manually.

* If you are happy with Sigma's interpretation of the addressees in the "Chop" and "Release" lines, press the "YES" key. Otherwise, press the "NO" key, correct the addressees and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

* For_Chop and For_Release citations for the message will be delivered to the Pending file of those users whose names or office codes you marked in the "Chop" and "Release" lines, respectively. You will have to hand-deliver printed copies to non-users.

CHOPPING ON A MESSAGE

PURPOSE: TO OUTLINE THE PROCEDURES FOR CHOPPING YES, CHOPPING NO, AND/OR SENDING A MESSAGE FOR FURTHER COORDINATION.

CHECKING TO SEE IF YOU HAVE MESSAGES FOR CHOP

* Type DI FI PENDING to display pending file.

* Press "EXECUTE" key, and press it again if asked to confirm. Pending file will appear on screen.

* Type RESTRICT FOR_CHOP in instruction line.

* Press the "EXECUTE" key, and press it again if asked to confirm.

* If you have no messages for chop, you will be told that "Your selector returned no entries." The rest of these instructions apply only if you do have.

* To display the first message sent to you for chop, press the "DISPLAY NEXT" key. A message should appear on the screen. You may scroll through the various parts of the message by pressing the "ROLL UP" or "ROLL DOWN" keys as needed.

SEEING THE WORK OF OTHER CHOPPERS

* You may, if you like, see what other choppers have had to say about the message so far. To do this, examine the "Drafter Chop Status" field. If any chopper's status is "Chop Yes" or "Chop No", you may examine changes they may have made. To do this, type "View Version <Chopper name>" in the instruction line. Press the "EXECUTE" key, and press it again if asked to confirm. His version will appear in the View Window, and you can scroll it to compare it with the version sent to you. You will only see his comments if he made them accessible to you.

PUTTING COMMENTS ON THE MESSAGE

* If you wish to make a comment on some part of your version of the message (in the Display window), move the cursor to the area where you want the comment to go.

* Press the "HERE" key.

* Move the cursor to the instruction line. Type "COMMENT <Access Specification>", where Access Specification is "PUBLIC" if you wish everyone to see the comment, "PRIVATE" if you wish no one but those who log on under your office code to see it, or "J342" if, for example, you wished only your office code and J342 to be able to see it.

* Press the "EXECUTE" key, and press it again if asked to confirm.

* Move the cursor to the comment field now displayed on your version of the message, and type in your comment. You may use more than one line if necessary. It is not necessary to press the "EXECUTE" key to have this comment recorded.

* These comments are viewable by other users (including the one who sent it to you for chop) only if they do a View Version instruction for your version, and if you chose to make the comments accessible to them. The comments become available as soon as you do a "FINISH" or a "CHOP YES/NO".

EDITING YOUR VERSION OF THE MESSAGE

* Instead of, or in addition to, putting comments on the message, you may edit your version. This editing may be done in most message fields (Sigma will refuse editing in protected fields).

* Move the cursor to the field you wish to edit. Use the two Delete keys (NOT the "DELETE ENTRY" function key) for character deletion. Use the typewriter keys to insert new characters. For more powerful editing features, review Lesson 5C.

* If you decide not to keep the editing you have done, type "ABORT" in the instruction line. Press "EXECUTE", and press again if asked to confirm.

* The editing you have done becomes a permanent part of your version if you press the "FINISH" key, or if you press the "CHOP YES NO" keys (see below).

CHOPPING YES OR NO ON THE MESSAGE

* When you chop on a message, it will disappear from your screen. A citation showing how you have chopped will be sent to the person who sent the memo or message to you for chop, and he will be able to see your editing (and comments, if you made them accessible to him) by doing a View Version with your user ID.

* To chop no, press the "CHOP NO" key.

* To chop yes, press the "CHOP YES" key.

* After you chop, you will be asked to acknowledge your instruction. Press the "YES" key to have the chop done; otherwise press the "NO" key.

SENDING THE MESSAGE ON FOR FURTHER COORDINATION

* You may, if you choose, send the message on to someone else for coordination or for release.

* Use the cursor control keys to move the cursor to the "Chop" line. Enter any additional names of offices and people that you wish to chop on your message (for example, J342 J34 MILLER JONES). You may also enter the office code you wish to release the message in the "Release" line. These names need not be users of the system, but of course the system cannot deliver copies to those that are not users.

* Use the cursor control keys to move the cursor to a name or office code in the "Chop" or "Release" lines that you wish to get a copy for chop on this round of coordination. Press the "HERE" key to make a mark on that name or office code. Repeat this for each name or office code you wish to receive a copy on this round. NOTE: If you do not mark the names or office codes, they will not get a copy for chop or for release when you press the "COORDINATE MESSAGE" key.

* Hold down the "SHIFT" key and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay the names of offices or people in the "Chop" and "Release" lines. If it recognizes them, it will highlight those that you marked. If not, it will add an asterisk to them. You may wish to print copies for these people to coordinate manually.

* If you are happy with Sigma's interpretation of the addressees in the "Chop" and "Release" lines, press the "YES" key. Otherwise, press the "NO" key, correct the addressees and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

* For_Chop and For_Release citations for the message will be delivered to the Pending files of those users whose names or office codes you marked in the "Chop" and "Release" lines, respectively. You will have to hand-deliver printed copies to non-users.

* In effect, you have created another round of coordination in which you are the originator, and the names you inserted are the choppers. When they chop yes or no, notification will come to you.

* This second round of coordination may be initiated whether or not you have chopped on the message yourself.

HANDLING A CHOPPED MESSAGE

PURPOSE: TO OUTLINE PROCEDURES FOR HANDLING MESSAGES CHOPPED ON BY CHOPPERS WITH WHOM YOU HAVE PREVIOUSLY COORDINATED THE MESSAGE.

CHECKING TO SEE IF YOU HAVE INCOMING "CHOPPED" MESSAGES

* Type DI FI PENDING to display pending file.
* Press the "EXECUTE" key, and press it again if asked to confirm.
* Type RESTRICT CHOPPED in the instruction line.
* Press the "EXECUTE" key, and press it again if asked to confirm.
* If you have no chopped messages, you will be told that "Your selector returned no entries." The rest of these instructions apply only if you do have.
* The citation for the chopped message will indicate who the chop is from, and whether he chopped "Yes" or "No". If he has edited or commented on his version, the citation will contain the characters "(ED)", e.g., "Chop(ED)-Yes."
* To display the first chopped message, press the "DISPLAY NEXT" key. A message should appear on the screen, in the display window. Note that this is your version of the message, not the chopper's.

VIEWING THE WORK OF THE CHOPPER

* Type VIEW VERSION <Chopper> in the instruction line, where <Chopper> is the office code that chopped on the message (J342, for example).
* Press the "EXECUTE" key, and press it again if asked to confirm.
* The chopper's version of the message will appear in the View window. If the chopper has either changed the text in his version, or has added a comment to the memo or message, the first line of his version will contain the highlighted word EDITED. If that word does not appear, it means that the chopper neither changed his text nor added a comment. Of course, even if he did add a comment, he may not have made it accessible to you.
* You may compare the chopper's version with your own version by scrolling the Display window (containing your version) and the View window (containing the chopper's version) separately. There is no easy way of finding the differences in the versions.

MODIFYING YOUR VERSION

* You may wish to modify your version of the message to reflect the editing or comments done by the chopper.

* One way of editing is is by using the two "DEL" keys (not the "DELETE ENTRY" function key) to remove old characters, and using the typewriter keyboard to insert new ones. For more powerful editing features, review Lesson 5C.

* If you wish to copy large blocks of text from the chopper's version into your version, you may find it helpful to use the Copy Text instruction. The next few steps discuss this.

* Move the cursor to the beginning of the text in the View window that you wish to copy.

* Press the "HERE" key.

* Move the cursor to the end of the block of text you wish to copy. You may have to use the "ROLL UP" key to do this.

* Press the "HERE" key.

* Move the cursor to the location in the Display window where you wish the block of text to be inserted.

* Press the "COPY TEXT" key.

SENDING THE MESSAGE FOR FURTHER COORDINATION

* After you have incorporated changes from several choppers into your version of the message, you may wish to distribute it for further coordination.

* Use the cursor control keys to move the cursor to the "Chop" line. Enter any additional names of offices and people that you wish to chop on your message (for example, J342 J34 MILLER JONES). These names need not be users of the system, but of course the system cannot deliver copies to those that are not users.

* Use the cursor control keys to move the cursor to a name or office code in the "Chop" line that you wish to get a copy for chop on this round of coordination. Press the "HERE" key to make a mark on that name or office code. Repeat this for each name or office code you wish to receive a copy on this round. NOTE: If you do not mark the names or office codes, they will not get a copy for chop or for release when you press the "COORDINATE MESSAGE" key.

* Hold down the "SHIFT" key and press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay the names of offices or people in the "Chop" line. If it recognizes them, it will highlight those that you marked. If not, it will add an asterisk to them. You may wish to print copies for these people to coordinate manually.

* If you are happy with Sigma's interpretation of the addressees in the "Chop" line, press the "YES" key. Otherwise, press the "NO" key, correct the addressees and repeat the "HERE" marking and the "COORDINATE MESSAGE" steps.

* For_Chop citations for the message will be delivered to the Pending files of those users whose names or office codes you marked in the "Chop" line. You will have to hand-deliver printed copies to non-users.

SENDING THE MESSAGE FOR RELEASE

* When the message is ready to be sent to the person you think should release it, make sure that his office code is entered in the "Release" line of your version.

* Move the cursor to the Release line, and place it on the office code of the Releaser.

* Press the "HERE" key.

* As before, press the "COORDINATE MESSAGE" key. A request to acknowledge Yes or No should appear. If Sigma recognizes the office code you marked, it will highlight it. If not, it will add an asterisk to it.

* If you are happy with Sigma's interpretation of the Releaser office code, press the "YES" key. Otherwise, press the "NO" key, correct the office code, and repeat the "HERE" marking and "COORDINATE MESSAGE" steps.

* A For_Release citation will be delivered to the Pending file of the Releaser. He may release the message, or he may chop No on it just as though he were a chopper.

* When your message is released, your version of it will say so. Look for the word Preparation near the beginning of the version. It will have the word "RELEASED" added to it.

* If instead the Releaser chops No, you will receive a Chopped citation which you can handle by the procedures outlined above.

PROCESSING A MESSAGE SENT TO YOU FOR RELEASE

PURPOSE: TO OUTLINE PROCEDURES FOR HANDLING MESSAGES SENT TO YOU FOR RELEASE, EITHER BY RELEASING THEM OR CHOPPING NO.

CHECKING TO SEE IF YOU HAVE INCOMING MESSAGES FOR RELEASE

* Type DI FI PENDING to display pending file.

* Press the "EXECUTE" key, and press it again if asked to confirm.

* Type RESTRICT FOR_RELEASE in the instruction line.

* Press the "EXECUTE" key, and press it again if asked to confirm.

* If you have no messages for release, you will be told that "Your selector returned no entries." The rest of these instructions apply only if you do have.

* To display the first message sent to you for release, press the "DISPLAY NEXT" key. A message should appear on the screen. You may scroll through the various parts of the message by pressing the "ROLL UP" or "ROLL DOWN" keys as needed.

RELEASING THE MESSAGE

* Before you release the message, you may wish to modify it. You may do this by using the two "DEL" keys (not the "DELETE ENTRY" function key) to remove unwanted characters, and using the typewriter keyboard to insert new characters. For more powerful editing features, review Lesson 5C.

* To release the message, hold the "SHIFT" key down, and press the "RELEASE MESSAGE" key. A request to acknowledge Yes or No should appear. Sigma will redisplay office codes that you may have entered in the "Distribution" or "Originating Office" lines.

* If you are happy with Sigma's interpretation of the office codes in those lines, press the "YES" key. If you have release authority, the message will be released. If you do not have release authority, an error message will appear. See J342 if you do not have release authority, and you think you should.

* If you are not happy with Sigma's interpretation of the office codes, press the "NO" key, correct the office codes, and repeat the last few steps.

CHOPPING NO ON THE MESSAGE

* If you do not wish to release the message, you may wish to return it to the person who sent it to you with a Chop No indication.

* Before Chopping No, you may wish to edit the memo or message. If so, use the technique described above in the section on Chopping.

* You may wish to put a comment on the message that the person who sent it to you for release can see. If so, follow the next few steps.

* Put the cursor in the area of the message you wish to comment on.

* Press the "HERE" key.

* Move the cursor to the instruction line, and type COMMENT (Access Specification), where Access Specification is PUBLIC, if you wish everyone to be able to see the comment; or the office code that sent you the memo or message for release, if you wish only the two of you to be able to see it.

* Press the "EXECUTE" key, and press it again if asked to confirm.

* Move the cursor to the comment field now displayed on your version of the message, and type in your comment. You may use more than one line if necessary. It is not necessary to press the "EXECUTE" key to have your comment recorded.

* Press the "CHOP NO" key. The person who sent you the message for release will receive a citation showing him that you chopped no on it.

READDRESSING A MESSAGE

PURPOSE: TO OUTLINE THE PROCEDURES FOR READDRESSING AN INCOMING AUTODIN MESSAGE.

WARNING: DO NOT ATTEMPT TO READDRESS MULTI-SECTION MESSAGES OR MESSAGES MORE THAN 14 DAYS OLD WITHOUT FIRST CALLING THE MME OFFICE (PAX356/358) FOR ASSISTANCE.

SELECTING THE MESSAGE TO BE READDRESSED

* Normally you will be going through a file and reading messages when you discover one that should be readdressed.

* If the message you wish to readdress is in the Display window, move the cursor to the instruction line and type READDRESS MESSAGE. Press the "EXECUTE" key, and press it again if asked to confirm.

* If instead you have a file in the Display window and see a citation to the message you wish to readdress, move the cursor to the desired message and press the "HERE" key. Then press the "READDRESS ENTRY" key.

* In either case, a readdressal form, with most of the message fields completed, will appear in the Display window.

FILLING IN THE READDRESSAL FORM

* If necessary, press the " ↓ " key to move the cursor to the "BRIEFING MEMO" line. Type in this field any information you want to pass to those who will chop or release this readdressal. If you need to enter more than one line, just keep typing; the field will automatically expand. Things you type here will NOT accompany the readdressal when it is released.

* Press the " ↓ " key to move the cursor to the "Precedence" line. If you wish, you may edit this line with the "DEL" keys and the keyboard.

* Press the " ↓ " key to move the cursor to the "To" line. Type in the addressees. To open new lines, press the "RETURN KEY".

* Press the " ↓ " key to move the cursor to the "Info" line. Type in the addressees whom you wish to receive info copies of the message.

* Press the " ↓ " key to move the cursor to the "EXEMPT" line. Type here any addressees you want to exempt from any AIG's you may have used in the "To" or "Info" lines.

* The message may now either be released, or sent for chop.

RELEASING THE READDRESSAL

* Press the "SHIFT" key and the "RELEASE MESSAGE" key simultaneously. A request to acknowledge Yes or No should appear.

* Press the "YES" key. If you have Autodin message release authority, the message will be released. If you do not have that authority, and think that you should, contact LCol. Smith in J342.

SENDING THE READDRESSAL TO THE CHOPPERS

* Chopping and releasing messages has been covered in some detail in earlier sections. It works much the same for readdressals. For details, see the section entitled "SENDING THE DRAFT TO THE FIRST CHOPPERS" on pages 2 and 3 of these instructions.

APPENDIX D

EXERCISE SPECIAL USER INSTRUCTIONS

USE OF THE MILITARY MESSAGE EXPERIMENT SYSTEM

This section provides the Operations Action Group (OAG) Action Officer with basic information on the use of the MME system during a crisis or exercise situation. Copies of this section will be provided to all crisis participants.

An account has been established on the system for your office code. This account is identified as a special account by the use of an "X" followed by the designation of the office role you are filling (e.g., XJ6). The MME XO should have given you the account names and passwords which must be used to access the system.

USE OF THE SYSTEM FEATURES

If you have not used an MME terminal before, here are some basic steps to get started.

1. Make sure you have office and personal account names and passwords.

2. Find an available terminal. While holding down the CNTL key (key to the left of the "q" key on the left side of the keyboard), press the RESET key (a special black key two rows above the "3"). Wait a few seconds, and a login template will appear. Using the "arrow" keys to move the cursor, fill out the template as follows:

   LOGON NAME: (Type your office code, e.g.: XJ6)

   LOGON PASSWORD: (Type password for XJ6) (Provided by MXO)*

   MAXIMUM SECURITY LEVEL: (enter S)

   (If required, enter) IDENTITY: (Type second account MXO gave you, e.g.: RUONE)

   ID PASSWORD: (Type password for your account).*

   *NOTE: For security reasons nothing will appear on these lines when you type your passwords.

   When you have finished filling in the template, press the !EXECUTE! key.

PREVIOUS PAGE IS BLANK

3. The system news will appear. This will contain in the first few lines any special information you need concerning changes to system procedures.

4. Pressing the !CLEAR VIEW! key (lower right corner, third row from the right) will clear the screen.

5. READING INCOMING TRAFFIC

   a. Put the cursor on the instruction line (the one with the two bell symbols), and type the instruction; DISPLAY FILE PENDING.

   b. Press the !EXECUTE! key.

   c. The system will ask you to confirm your instruction; press the !EXECUTE! key again. You should now have a file displayed on the screen. This file contains 'citations' which are short summaries of the messages in your PENDING file.

   d. Type the instruction; FIND ENTRY 1.

   e. Press the !EXECUTE! key and confirm as required. This step will make entry 1 the current entry in the file and place the entry 1 at the top of the display window.

   f. To read or 'display' entry 1, press the !DISPLAY ENTRY! key. NOTE:* This key is called a function key and is located in the top row, first key to the right of the yellow security level area. You now should have a message displayed on the screen.

   g. To display the next message, hold down the SHIFT key and press the "DISPLAY NEXT ENTRY" key. NOTE:* This is the same function key that you pressed to obtain the first message; when the shift key is simultaneously depressed, the operation written above the key is executed.

Page 2 of the J3 Users Guide provides more information about other ways of finding and reading messages.

6. RESTRICT, KEYWORD, FILE AND DELETE

RESTRICT is an instruction which allows you to pull together certain message citations into groups. The criteria for selecting these messages are specified by the user at the time of execution of the instruction. Some of the things that can be used are Keywords, Message Precedence, DTG, Originator, Action, etc. For example, executing "RESTRICT Z" will put together a display of all the flash messages in your file.

To aid you in locating groups of related messages, the system offers two methods. For the user who wants to retain all messages in one file, the system provides KEYWORD capabilities. For the user who prefers separate FILES for his messages, the system allows you to create new files. HINT: The first time through your pending file, add KEYWORDs to your important message traffic. This will allow you later to restrict to these for review or for filing into appropriate files.

KEYWORDS

To apply a keyword to an entry, type the instruction; KEYWORD <ENTRY> <KEYWORD> (DO NOT TYPE THE < OR THE >.)

EXAMPLE: KEYWORD 5 "GHOST"

This will associate that citation with the keyword GHOST; and any time you restrict to entries that are keyworded GHOST, you will get Entry 5 and any other entries keyworded "GHOST" (unless moved or deleted).

FILES

To create a file for your use type the instruction: CREATE FILE <FILE NAME> <CLASSIFICATION>.

EXAMPLE: CREATE FILE SPIRIT SSS

This gives you a file called SPIRIT into which you may file message citations through the SECRET classification level.

SELECTORS AND ALERTS

To aid you in screening large files for citations that may be of interest, the system allows you to specify message criteria for it to identify (select) particular messages. This may be done in two ways; you may RESTRICT with typed-in criteria, e.g., RESTRICT Flash and From "JCS", or you may have a pretyped selector that you can use by typing: RESTRICT WITH <SELECTOR NAME>. The KEYWORDs you may have associated with certain messages can also be used: RESTRICT KEYWORD "GHOST".

The ALERT-SELECTOR causes a "beep" when a message of interest arrives in your account. This selector has been pre-set to warn you of high-precedence traffic in your pending file. Other criteria which will alert you to the arrival of other than high-precedence messages may be added to the selector. To see what messsages the alert selector has screened for you, press the !ALERT ON OFF! key located at the far right of the keyboard.

For more information about selectors, ask the Training Officer or the MXO.

STATUS OF ACTION LOG

You will have access to the MXO's Status of Action Log. At any time, you may review this file by typing the instruction: DISPLAY STATUS_OF_ACTION (NOTE: Underlines are required for multiple-word file names).

DELETE

Deleting entries in files gets rid of those citations which you no longer need. Type the instruction: DELETE ENTRY <NUMBER>. Deleting unneeded citations also allows the system to respond faster to many of your instructions. **IMPORTANT** Files of more than 1,000 entries may cause system response degradation; files of over 5,000 entries will cause your system job to crash.

7. SENDING NOTES

The MME system allows you to send notes to other users without the need for coordination. These notes can be used during the exercise for such things as simulating secure telephone calls. To prepare a note, use the following steps:

a. Type: CREATE MESSAGE NOTE <CLASSIFICATION>. This will place a template in the display window. In the TO: line type the logon names of other users you wish to receive copies of the note (e.g., XJ3 CONT). Put your own logon name in the CC: (carbon copy) line. Fill in the Subject: line and Text: field.

b. When you are finished typing the note, hold the shift key down and press the !RELEASE! key. The system will ask you to acknowledge by pressing !YES! or !NO!. If the system does not recognize any of the logon names in the TO: or CC: lines, it will add an asterisk to them. To change them, acknowledge !NO! and repeat these steps as needed. If you are happy with them, acknowledge !YES!.

c. In a few minutes the system will add to your pending file a File copy and an Incoming copy of your note. We recommend that you delete the File copy and keep the Incoming copy; it will have the same DTG as the copies sent to your other addressees.

8. OUTGOING MESSAGES

The MME System allows transmission of outgoing AUTODIN messages. This section discusses READDRESSALS, NARRATIVES, and the CINCPAC SITREP creation.

READDRESSALS

To readdress a message use the following steps:

a. Place the cursor on the entry number that you desire to readdress.

b. Press the !HERE! key located to the right of the keyboard.

c. Press the !READDRESS ENTRY! key located on the top right end of the function keys.

d. This will cause a preformatted, partially-filled-in template to appear in the display window. By moving the cursor down to the TO: Field, you can enter the addressees to which you desire to have this message readdressed. Enter only one addressee per line; form new lines if needed by pressing the RETURN key.

e. Add the required comeback distribution in the distribution field.

f. Type CONT in the RELEASE field of your draft. Using the arrow keys move the cursor back under one of the letters in CONT and press the !HERE! key. Then press the !COORDINATE! key (acknowledge YES as requested). This will forward the message to the Controller who can release it.

g. If more details are required, refer to pages 21-23 of the Users Guide.

NARRATIVE MESSAGE PREPARATION

To prepare an AUTODIN message for release, use the following steps:

a. Type the instruction: CREATE MESSAGE AUTODIN <CLASSIFICATION. This will place a template in the display window. You may now add the appropriate Addressees, Text, Distribution, Chop Offices, and Release Office for your message.

b. Type CONT in the RELEASE field of your draft. Using the arrow keys move the cursor back under one of the letters and press the !HERE! key. Then press the !COORDINATE! key (acknowledge YES as requested). This will forward the message to the Controller who can release it.

c. For assistance in preparing and coordinating messages, refer to pages 11-21 of the Users Guide.

9. SITREP PREPARATION

The following steps should be used to prepare your section of the CINCPAC SITREP:

a. Type the instruction: DISPLAY TEXT XXX SITREP INPUT (where XXX is your crisis office code).

b. This will put a text object in your display window. The first time you display this object, it should be empty.

c. Move the cursor into the text object, and type in your section of the SITREP.

d. When finished, press the !PRINT DISPLAY! key and then the !FINISH! key. This will give you a printed copy of your input; the finish is required so that the MXO/DCAC has access to the current version of your input.

e. When preparing further inputs for the SITREP, you can erase the text from your previous input, or edit the portions of the text that have changed. This should reduce the amount of work required in future inputs.

APPENDIX E

TRAINING-RELATED USER COMMENTS

Action Officer. Learned system use through introductory lecture and on-line lessons. Found on-line lessons very useful but wanted supplemental text which he did not know was available. Frequently used Sigma Primer and found it effective. Enjoys using automated systems and found MME easy to use and learn. Found Staff helpful (especially Miller) in responding to questions.

Department Admin/Clerical. Found system difficult to learn at first. On-line lessons were poor. Many things didn't make sense at first. Now the system seems natural to him. Did not use HELP feature much.

Surface Officer. Got introductory lecture, used reference publications and on-line lessons. Continues to seek help as needed from on-site staff. Had no trouble learning portion of system he uses frequently.

DDO. Learned system mainly through on-the-job-training and asking questions of Ishii and Smith. He felt the indoctrination session didn't help and he hated the on-line lessons. Did not like any of the interactive training aids. The user's guide was helpful.

Air Officer. He felt we may be concentrating too much on training officers, and (at least in the command center) not enough on training clerks. In particular, he thought J3 should be making more use of clerks for entering data -- such as that required for the Air summary -- a daily report. He went on to say that the Help facility was not user-oriented, and that the Reference manual was not much better. He found the Primers a little better. He thought the on-line lessons were boring -- were written at too low a level of detail, and were not "effectively written" -- that is, did not make a point clearly and get to it quickly.

Directorate Admin/Clerical. He felt that the training he received was only marginally useful. He thought the on-line lessons were too wordy and he found the Sigma Primer much more useful as a way of familiarizing himself with the system's capabilities.

Branch Admin/Clerical. He attended the introductory lecture and took almost all the on-line lessons. He felt that the on-line lessons were too lengthy and took too much of his time. He felt that the Primer was somewhat useful except that it did not explain things enough. He found the manual to be the most useful training tool and still uses his year-old version of it. In general, he found the system easy to learn to use.

Action Officer. He found the on-line lessons to be tedious and wordy. He was introduced to the system by a friend of his in the Command Center who showed him how he could use the text objects for his briefing presentations. He felt that the hands-on experience, with the help of the SIGMA Primer, was the most valuable training tool.

Message Router. The Prompt feature strikes him as rather difficult to use and understand, but he was very favorably impressed by some recent experiences with Help. He finds on-line lessons long and boring, and not terribly well written. He thinks they would be better if there were less expository material, more and shorter exercises, and some sort of automated index to on-line lessons, similar to the interface with the Help instruction. He finds the Primer more helpful than the Reference Manual, but wishes it were arranged by function rather than by Sigma object.

Action Officer. Attended lecture, took on-line lessons, asked questions, from time to time, of Miller. Found on-line lessons effective.

Message Router. He had no trouble learning to use the system, and said that it was easy to understand. He felt that the training provided was adequate and that the on-line lessons were very informative. He didn't find much use for the "prompt" and "help" keys; he rarely used them, even when he was first learning to use the system.

Division Secretary. She felt that the on-line lessons were too long and wordy and that the hands-on experience was the most valuable. Sgt Spencer had showed her what she needed to know for the system and when she got into trouble, she relied on the user's guide prepared by J3 and MITRE. She only learned what she needed to know to accomplish the tasks she had to perform on the automated system.

Division Chief. Got introductory lecture from Miller. Learned enough about system that way to get by. Understands system only at a superficial level which is enough for his activities. Used on-line lessons also at one time, but system offers more capabilities than are normally utilized.

Surface Officer. He found the User Aids (lecture, documentation, on-line lessons, etc.) "not bad".

Action Officer. He hadn't explored the Prompt and Help features very much, and so didn't find them as useful as he might have. For instance, he wasn't aware that Prompt could be taken to the second level (apparently he had never read that part of the reference manual, and it had not been shown in his introductory lecture). He felt that the on-line lessons were limited. He was especially frustrated by the constraint which prohibits issuing instructions other than the one being illustrated while doing an exercise in a lesson.

Message Router. He felt SIGMA was fairly easy to learn to use but attributed that fact to his previous exposure to computers. He felt the on-line lessons were helpful initially but he was not interested in learning those instructions which he did not need to use to accomplish his message distribution tasks. He suggested that training might be geared towards the different types of users. For example, special training materials would be developed for those involved with message distribution.

Surface Officer. He read both the reference material and the Primer. He felt that Miller's one hour introductory lecture was worth five of using the reference materials. He tried the on-line lessons and found them useful. He does not use many of the system features but what he needs to use, he knows well.

Branch Admin/Clerical. Learned system mainly by being shown how to do particular tasks by colleagues. Did not find it especially difficult to learn.

Branch Admin/Clerical. He used both Prompt and Help, finding them moderately helpful. He thought the on-line lessons were good, and in his own case thought they helped him pick up the details of Sigma much more quickly (he thought his previous DP experience enabled him to grasp the fundamentals easily).

Deputy Division Chief. Found system difficult to learn at first. Best procedure was to have his NCO learn and then tell him how to do things he needed to do.

Action Officer. He thought the Prompt feature was helpful, but would have been enhanced by containing examples. He felt the Help material required too much reading, and seldom used either the Reference Manual or the Primer. He found the on-line lessons helpful only for someone just starting to use the system.

Directorate Admin/Clerical. She felt the training she was provided was inadequate. She did go to the introductory lecture but did not have time to wade through the on-line lessons. What she learned, she learned with the help of the SIGMA Primer, Sgt. Divens and things she did on her own in her spare time. She would have preferred an intensive training session over several days with labs and hands-on experience.

Action Officer. He had no complaints about the training he received; he took many of the on-line lessons and found them informative and helpful.

Branch Admin/Clerical. He felt that the training offered him was adequate but he felt he got the most out of the hands-on experience he had. He felt that the on-line lessons gave the user a good familiarization with the system but that there should be less flexibility in taking them; he felt that users should take them with a trainer standing close by.

Division Admin/Clerical. He found the on-line lessons useful and felt that they explained everything very well. This was not true of the accompanying exercises which he felt should be more lenient; i.e., the rigid restrictions on the instruction set permitted should be removed. He frequently had to exit from an exercise and lesson in order to practice what the lesson covered. He had no strong preference for the different training documents (SIGMA Reference Manual, SIGMA Primer, and Users Guide) since he found them all useful. He did not use the HELP instruction except a few times because the on-line lessons gave the same information. He felt this instruction was a wasted effort. On the other hand, he found the PROMPT instruction very useful since it gave him the specific limited information he needed to carry on at that point.

Air Officer. He found the introductory lecture and on-line lessons useful. He felt that using the documentation was "the only way to go." However, some sections of the manuals were poorly written; e.g., how to create selectors and what they will do for you.

Action Officer. He sometimes used the Prompt facility, and found it helpful. He took a couple of on-line lessons at the time he was preparing for the exercise, and found them good for his purposes.

Surface Officer. Found system difficult to learn and understand at first. Best form of training was actual use of the system.

Branch Admin/Clerical. He didn't find the Help feature helpful, and he wasn't fond of the on-line lessons, feeling that a one-on-one encounter with someone who knew the system was much more productive.

Divison Admin/Clerical. He felt that the training he was provided was inadequate. He never had time to take the on-line lessons and, therefore, feels his knowledge of the system's capabilities is very limited. (What he did learn about the system, he learned on his own or with the help of Dave Miller and the more experienced users within close proximity of his office.) He felt that a thorough indoctrination period of several days was necessary for a user to gain a full appreciation of the system's capabilities. He did not find the "prompt" and "help" functions very useful when he got into trouble. He did say that he found the system easy to learn but pointed out that he only uses a small part of all its capabilities.

Action Officer. Did a few of the on-line lessons, but found them of decreasing usefulness. They became repetitive for him. Instead, he found it more effective to experiment with the system. Seldom (once or twice only) used HELP feature. Found PROMPT feature particularly un-helpful.

Air Officer. Very well trained via on-line lessons, primer, and on-the-job-training. Enjoys new ways of doing things. Happy with feedback to developers for new features. Became expert. Found proficiency helps remarkably in attitude toward system. Went from anti to pro MME over the years.

Message Router. His formal training on the system was minimal. His first exposure to SIGMA was as a benchmark test participant (with a member of the MME staff standing close by). He took a few of the on-line lessons but did not find them helpful. He felt they would have been more helpful had they been considerably shorter; he did find the "prompt" and "help" keys useful when he first started to use the system. In general, he found it easy to understand. (He attributed this fact to his previous exposure to computers.)

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