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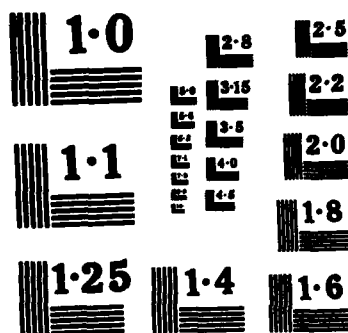
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Baseline Data Report Test Group

Nancy C. Goodwin
The MITRE Corporation
19 September 1978

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MITRE Technical Report
MTR-3885

***Military Message Experiment
Baseline Data Report
Test Group***

Nancy C. Goodwin
The MITRE Corporation

19 September 1978

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Department Approval: J. A. Clapp
J. A. Clapp

MITRE Project Approval: Nancy C. Goodwin
N. C. Goodwin

ABSTRACT

Data in this report describe manual message-handling procedures in the Operations Directorate at CINCPAC. Message-handling tasks include distribution, usage, filing, retrieval, creation, coordination, release, and transmission/post-transmission handling. Positions described are administrative/clerical, action officer, and Command Center Watch Team (CCWT). Time spent on tasks varies according to position and division/branch, as well as message load.



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It is important to note that messages are only one form of written communication used in J3. Letters, memos, and other documents are also used. Thus, to help personnel with their complete communications job, a computer system should provide support for other types of formal communications, as well as for informal notes.

TRANSMISSION AND POST-TRANSMISSION

Once released, the outgoing message is sent to the Communications Center for transmission over AUTODIN. (Memos are circulated within CINCPAC; letters are mailed.) At the Communications Center the message is checked for format, addressee list, releaser's signature, etc. Flash and Immediate messages are processed directly. Priority and Routine messages are put in a tray for processing as soon as a clerk has time.

The average processing time for Priority Messages is 76 minutes from time of receipt in the Communications Center to time of transmission. For Routine messages the average processing time is 131 minutes. These times vary, of course, according to the time of day and the outgoing message load. Comeback copies prepared for the originators and drafter designated addresses are processed and delivered along with the incoming messages.

COMMENT

In J3, a person's message-handling activities vary according to his position and to his division or branch. Activities also vary from day to day, depending on current assignments. It would be possible for a clerk to spend all of a day distributing, filing, and typing messages. It would be possible for an action officer to spend all of a day reading, retrieving, creating, and reviewing messages. This is not usually the case. Looking at figures 1 and 2, we see that on most days personnel spend less than half their day on message-handling activities. In fact, on many days many officers are not involved in handling outgoing messages at all. Incoming messages far outnumber outgoing messages; however, in a message-by-message comparison, outgoing messages take relatively more time to handle.

COORDINATION AND RELEASE

Before a message can be transmitted and released, it must be coordinated to ensure accuracy and completeness. After all interested parties have approved the message, it is sent to the Director or a designated representative for formal release. Only after the message has been released can it be transmitted. Most messages are seen by three to five coordinators before they are sent for release.

The number of messages the action officers receive for coordination varies considerably from position to position. Some officers may receive only one message a week; others receive one or two a day. Branch chiefs tend to receive the most messages; they may review these themselves, or they may give them to a member of the branch to review.

On days when messages are received for coordination, the time spent reviewing and commenting on the message may range from 5 minutes for a routine message to an hour or more for a long complicated message. On the average about 25 minutes are spent coordinating messages. Officers in category 1, who receive the greatest number of incoming messages, are the least involved in coordinating outgoing messages, letters, and memos.

Fewer messages are received by Command Center duty officers for their coordination. When they do receive messages, they average about 10 minutes on coordination tasks.

Messages are released by the J3, the Director of Operations, or by his representative: the J3 deputy, a division head, or the DDO. Message release is a routine task, which takes only a few minutes for each message. The releaser relies on the preparation and review already done by the originator and the coordinators.

The number of messages, letters, etc., that are drafted by action officers does not vary greatly from category to category. Although the data do suggest that officers in category 3 create more outgoing communications than the other officers, even these category 3 officers create only about two items per day and often have days when no message, letter, or memo creation occurs.

As figure 2 shows, however, creation is a relatively time-consuming task. The originator must gather background information and organize the material, as well as write the message. Although some messages, letters, and memos are routine communications requiring little effort, and although some are difficult lengthy items taking several hours to write, most take about an hour of the officer's time.

Typing these communications is also a relatively time-consuming task for clerical personnel. Since each clerk supports several action officers, the clerk handles a higher number of outgoing items. Overall, clerks type (and retype) an average of four outgoing items daily. The amount of time taken depends on the length of the items, but on the average clerks spend 75 minutes on typing tasks.

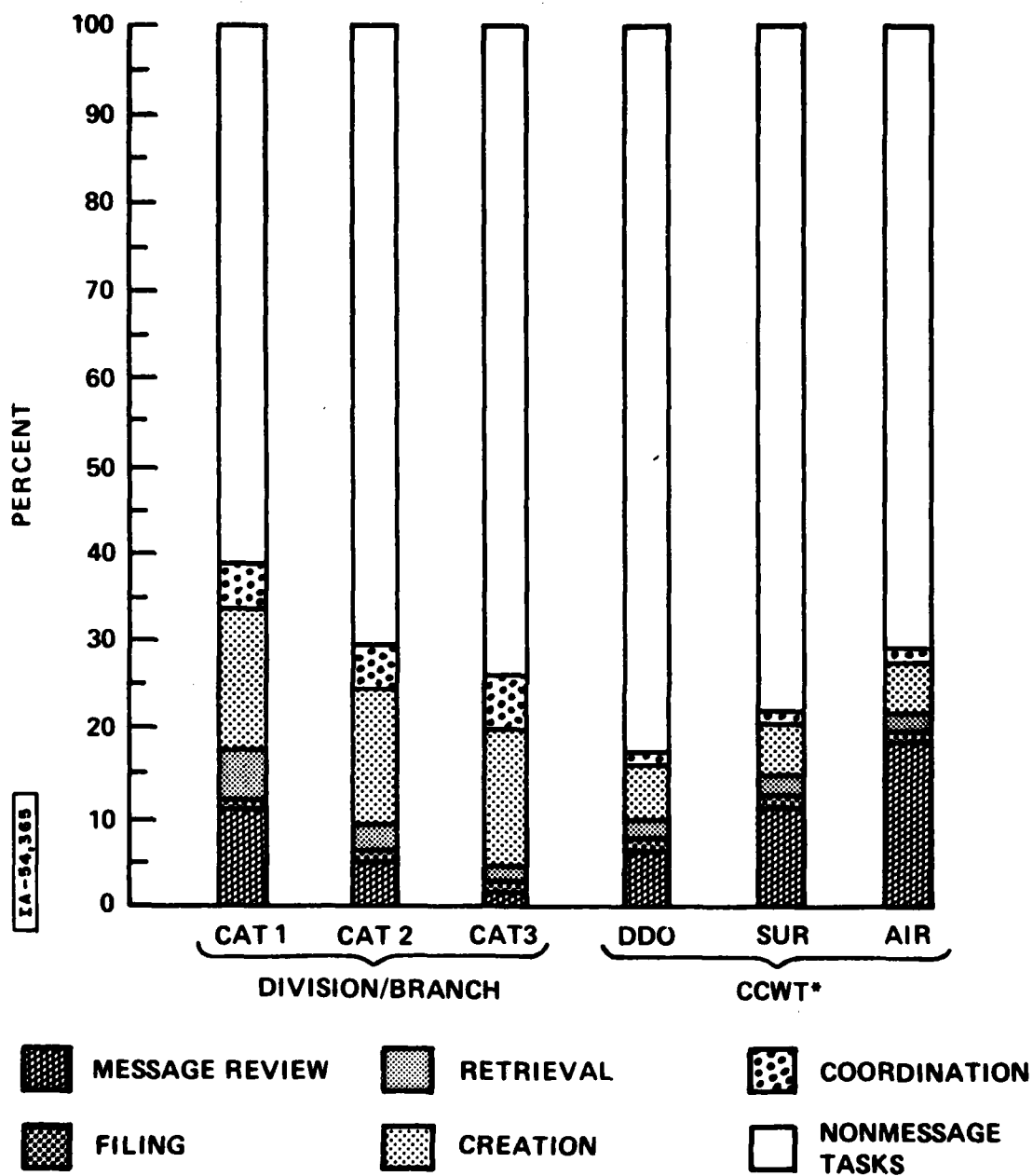
Fewer outgoing messages, letters, and memos are sent from the Command Center; some of the messages are transmitted over the WWMCCS system to the LDMX and AUTODIN. On the average, Command Center duty officers together sent about four outgoing items per shift, and they spent an average of 40 minutes on creation tasks. The clerks, perhaps because they were sometimes using the WWMCCS terminals which provide on-line editing capabilities, spent an average of only 18 minutes a day typing and retyping outgoing communications.

In the divisions and branches the clerical personnel handle most of the filing for the officers. Although filing may not be done every day, it generally takes about one-half hour of the clerk's time when it is done. Filing may accumulate over several days or occur as a project is finished. Relatively less retrieval is done, since messages of current interest are kept at the officer's work place and do not need to be retrieved from the branch files. In addition, as shown in figure 2, the action officers do relatively more retrieval than filing, which suggests that when they need something they find it for themselves. For example, on days when retrieval occurred, officers in category 1 spent an average of 30 minutes retrieving messages, in category 2 fifteen minutes, and in category 3, ten minutes.

The pattern in the Command Center is similar with the clerks doing most of the filing and relatively little retrieval. Although the duty officers do some retrieval, they also keep messages of current interest at hand, so do not usually need to retrieve messages from long-term storage. When they do need such retrieval, they often recall the message from the Communications Center, a task they can accomplish with a telephone call. The message is delivered directly to the Command Center via a pneumatic tube.

CREATION

Messages are formal, record communications. They are drafted in response to other messages and in response to nonmessage communications, and to initiate an action or project. Letters, memos, and other types of communications are also drafted.



NOTES: *CCWT BASED ON 12-HOUR SHIFT.
ALL OTHERS BASED ON 8-HOUR SHIFT.

Figure 2. Proportion of Day Spent on Message-Handling Tasks by Action Officers and CCWT.

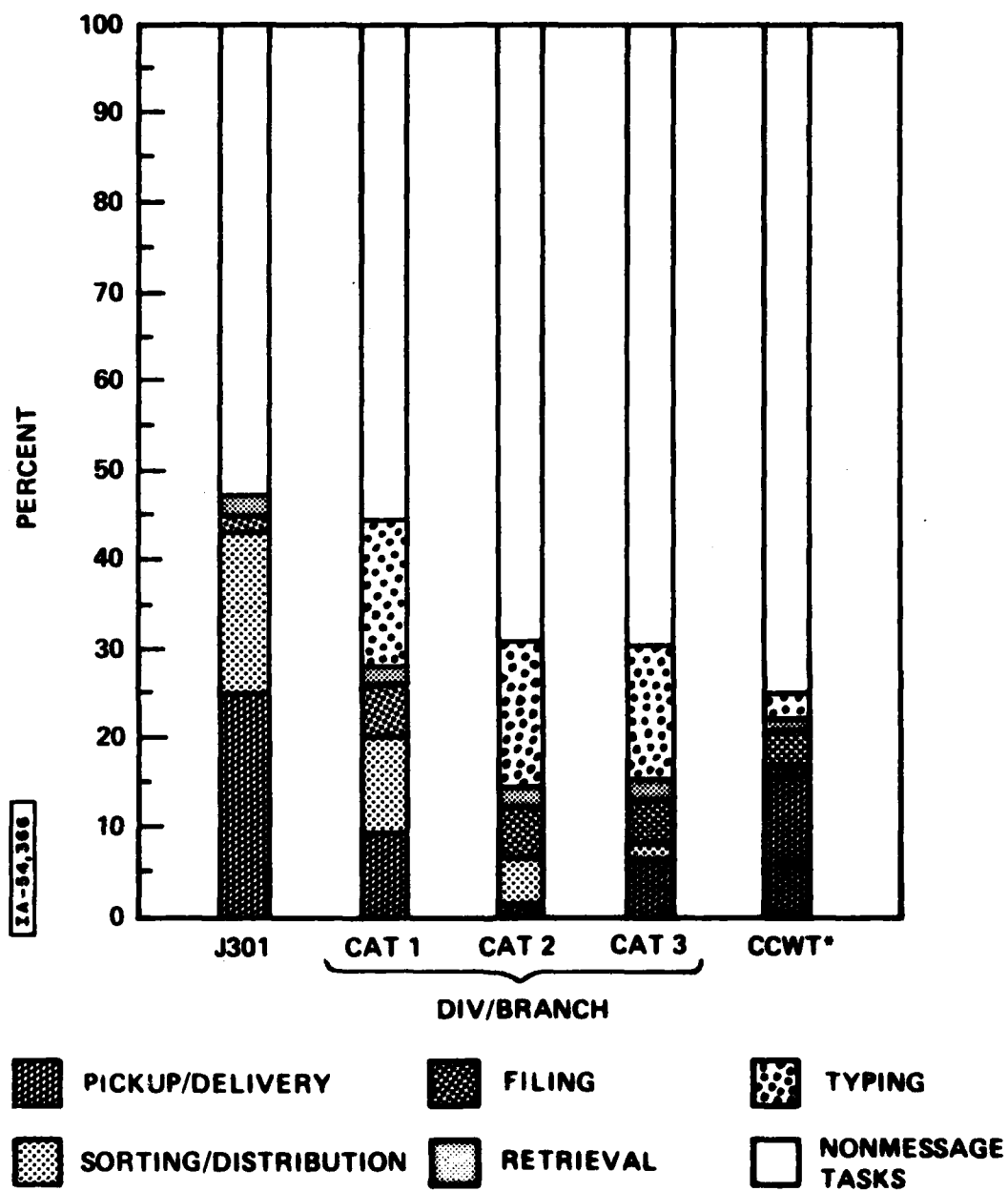
messages and 39 info messages daily; they spend about 45 minutes on this review. Officers in category 2 receive very few action messages. They spend about 25 minutes daily reviewing an average of 50 info messages. In category 3, only a few action and info messages are received, and about 5 minutes are spent reviewing incoming messages.

In the Command Center, message review is affected by the personal style of the duty officers, as well as by the assignment or desk. During the period data were being collected, the DDOs averaged 40 minutes of message review, the Surface Ops duty officers averaged about 80 minutes, and the Air Ops duty officers averaged 120 minutes. The Air Ops duty officer can be expected to spend the most time on message review, since he has the responsibility for creating the Director's readboard. The DDO can be expected to spend the least time, since he has the broadest range of duties.

FILING AND RETRIEVAL

Messages are kept in microfilm files for several years in the Communications Center. In the Admin Section (J301), paper copies of the messages are kept in file boxes for 30 days. When a message is needed but cannot be found in division or branch files, a copy is requested from J301. If the message is more than 30 days old, it is requested from the Communications Center.

In J301 preliminary filing is done in conjunction with the message sorting for distribution. Final filing (by minute of the message's date-time-group) is done on the night shift. As shown in figure 1, during the regular workday filing takes only a few minutes of the day. Retrieval is also a minor task. J301 clerks receive only a few requests each day for messages in their files. These can usually be satisfied in 5 minutes or less.



NOTES: *CCWT BASED ON 12-HOUR SHIFT. ALL OTHERS ON 8-HOUR SHIFT.

Figure 1. Proportion of Day Spent on Message-Handling Tasks by Administrative and Clerical Personnel.

of effort a clerk spends on message distribution depends on the division and branch that clerk supports.

In the Command Center, the clerk spends some of his time monitoring the printer and distributing these messages to the duty officers. He spends a higher proportion of his time on message distribution than do the division and branch clerks.

Figure 1 shows the proportion of the administrative and clerical personnel's time that is spent on various aspects of message handling. It is interesting to note that the clerks in Admin Section, which has the most stable workload, spend almost 50 percent of their time on message handling. Most of this is spent on tasks related to distribution of new incoming messages.

In the divisions and branches, the amount of time spent on distribution varies according to incoming message load. However, it is also related to the distance of the office from the Admin Section. Some of the category 3 offices are relatively far from J301, so these clerks spend a disproportionate amount of time picking up a few messages.

MESSAGE USAGE

Messages provide information for action officers, who may need to respond to them or to save them for future reference. Figure 2 shows the relative amount of time that various message-handling tasks take in an officer's day. (The figure does not show an average day, but does show the proportion of a day that each task takes on the average when it needs to be done. All tasks may not be done on all days.)

The amount of time spent on message review varies according to the message load. Officers in category 1 review an average of 11 action

Communications Center. (Immediate and higher precedence messages are handled by a telephone call by the CCWT, so further processing by the Communications Center is not relevant to the time it takes an officer to see the message for the first time.)

Most of the message distribution effort is spent in the Communications Center, where message copies are prepared for distribution, and in directorate Administrative Sections, where the initial decisions are made on action assignment and info message routing. Some effort is spent on distribution in the division and branch offices, but it is less than that spent in the directorate office.

Observation at J301 showed that they process a batch of messages on the average in 25 minutes. This includes time for sorting the batch, assigning action, preparing the messages for pickup or delivery, and preliminary filing. Delivery to the division or branch takes an additional 10 minutes.

The age of the message when it reaches the action officer is related to precedence as well as the time of day it is printed on the LDMX. Priority messages average 2 hours from delivery at the LDMX to delivery at the division or branch, and Routine messages take an average of 3 hours to be processed and delivered. Some divisions do not have messages delivered by J301, but send their own runners to the Administrative Section to pick up messages. In these divisions the messages might be still older upon receipt.

The message load for the J3 directorate is fairly stable, averaging about 2,000 messages a week. At the division and branch level, the load is relatively stable for a particular division or branch, but varies considerably from division to division and from branch to branch. Thus, the amount

Outgoing messages are created by an action officer, typed by the clerk, and coordinated with other personnel to ensure completeness and accuracy. When the message is ready, it is sent to the Director or his representative for release. Following release, the message is brought to the Communications Center for transmission. A "comeback" copy of the outgoing message, as transmitted, is then delivered to the originating office and to other directorates designated in the drafter distribution field on the form sent to the Communications Center.

In the Command Center, incoming J3 messages and all high precedence messages are reviewed, so that the responsible officer can be notified if quick action is needed, and so that developing situations can be monitored. Messages are also reviewed for inclusion in the Director's readboard. In times of crisis or during exercises, the Command Center becomes the center of operations. Special teams are brought in to handle the crisis, while the CCWT continues to monitor noncrisis or exercise activities and to provide support to the crisis/exercise management teams.

DISTRIBUTION

From the time it is printed on the LDMX to the time it is delivered to the division or branch for use by the action officer, an incoming message passes through several phases of distribution. Depending on its precedence and time of arrival, a message may take from 1 minute to 6 hours to process in the Communications Center. On the average, Routine messages are processed in 76 minutes, Priority messages in 58 minutes, Immediate messages in 24 minutes, and higher precedence messages in 5 minutes or less. The next step is for the message to be picked up and processed at the directorate Administrative Section. Priority messages wait an average of 30 minutes, while Routine messages wait an average of 80 minutes to be picked up from the

OVERVIEW OF PROCEDURES

Messages are sent to CINCPAC via the AUTODIN system. They are received at the Communications Center, where they are printed at the Local Digital Message Exchange (LDMX). (Messages of Immediate or higher precedence are printed concurrently on a printer in the Command Center.) The LDMX identifies an action directorate for each message. At the Communications Center, copies of the messages are made and sorted for pickup by clerks from the directorates designated to receive the messages. During duty hours, the Communications Center notifies the Administrative Section of the action directorate if a message has an Immediate or higher precedence.

At the directorate Administrative Section the messages are sorted, and responsibility is assigned for action messages. If a message deals with a topic in which a branch or office is known to have special interest or expertise, the message is assigned directly to that branch or office. Messages are held for pickup by some divisions and delivered to others. In some division offices a further action assignment may be made. Messages are then delivered to a branch or action officer.

Action officers review the incoming messages, take action when necessary, and make decisions about filing the messages for future reference. The officers may also need to retrieve old messages for use as references to an outgoing message or to serve as background for their decision-making.

At the division and branch level, the clerks and administrative clerks distribute, file, and retrieve incoming messages.

The primary purpose of this report is to present the data describing manual procedures, so that patterns of message-handling activity can be determined and in the future compared to patterns of computer-aided message handling. Changes in message-handling procedures can thus be observed, and the effect of the computer system can be determined. The remainder of this section summarizes manual message handling as observed in the Operations Directorate (J3) of CINCPAC. Details are presented in the sections that follow.

PARTICIPANTS

For purposes of the evaluation, members of the J3 test group have been divided into several categories. The primary groupings are those of action officers, the Command Center Watch Team (CCWT), and clerical and clerical level administrative personnel. Action officers have been further divided into three categories based on their incoming message load. (In category 1, a moderate number of action messages and a heavy load of information (info) messages are received. In category 2, the action message load is light, but the info message load is heavy. The action and info message loads are both light in category 3.) The CCWT is composed of a DDO (Duty Director of Operations), an Air Ops duty officer, a Surface Ops duty officer, and a clerk. The clerical and clerical level administrative personnel have been divided into categories according to the incoming message load in their division and branch with J301, the Administrative Section for the directorate, handled as a separate category.

SECTION 1

SUMMARY

The Department of Defense Advanced Research Projects Agency (DARPA), the Naval Telecommunications Command (NAVTELCOM), the Naval Electronic Systems Command (NAVELEX), and the Commander in Chief, Pacific (CINCPAC), are supporting an evaluation of the usefulness of computer-aided message handling in a military environment.

→ A computer-aided ^{for message handling in a military environment} system is being installed for use by selected members of CINCPAC's Operations Directorate (J3). The system will aid these personnel in distributing, reading, filing, retrieving, creating, coordinating, and releasing general service (GENSER) messages of Top Secret and lower classifications.

The test plan¹ and procedures² describe several types of data collection for evaluating the system. Data describing current manual procedures have been collected; data describing system usage are being collected throughout the operational evaluation.

Personnel in CINCPAC's J3 directorate were divided into two groups. One group is composed of personnel who will be trained to use the computer system for message-handling tasks. This volume of the Baseline Data Report describes current procedures for this group of future system users. The second group is composed of personnel in J3 who will not be trained to use the computer system. Data describing the second group's current procedures will be reported in Volume II of the baseline report.

SECTION 2

DATA COLLECTION AND REPORTING PROCEDURES

Potential computer system trainees who provided baseline data were drawn from the following parts of J3: J301, Administrative Section; J31, Operations Division; J32, Nuc Ops/Safety Division; J33, Command and Control Division; and J34, Technical Requirements and Evaluation Division. In this report, the primary distinctions among these personnel are generally not their divisions but their functions.

There is a significant functional difference in terms of message-handling procedures between personnel under jurisdiction of the Command Center and personnel in other divisions and branches. (Command Center personnel include officers and enlisted men working on the Command Center Watch Team (CCWT), in the Joint Reconnaissance Center (JRC), and in the Emergency Action (EA) Booth.) Persons in the Command Center are responsible for monitoring the overall Pacific Command (PACOM) situation and for identifying incipient crises. They are charged with ensuring that the responsible CINCPAC staff is made aware of urgent messages. Thus, Command Center message-handling activities generally involve distribution rather than staffing a reply.

Action officers and clerical personnel outside the Command Center are also supported by administrative procedures designed to handle less urgent messages. Because of these differences in procedures, data collected from action officers will be reported separately from those collected from Command Center personnel.

There is also a functional difference between two groups of non-commissioned officers, clerks, and secretaries outside the Command Center. Some of these persons have duties that are primarily administrative, while others (under direction of the first group) have duties that are primarily clerical. In addition to the Administrative Section (J301), which handles message distribution at the directorate level, there are persons at the division and branch level who handle distribution and other similar administrative tasks rather than clerical tasks. Throughout this report, the term "administrative personnel" refers to clerical level administrators rather than executive level administrators.

The number of persons of various types who supplied data for this baseline effort is shown in table 1. (The questionnaires and checksheets are explained in the next subsection.) These major types are used throughout the report, although for some functional areas the data and functions sometimes led to slightly different groupings within a type or set of types. These groups will be explained as they occur. The "total days of data" shown for the checksheets represent the sum of days reported by all members of a type. Not all respondents filled in checksheets on all days. One action officer may have filled in a checksheet for 10 days, another for 4, another for 2, and so on. Thus, in the 1978 data collection period, 29 action officers supplied a total of 147 days of data. The amount of data supplied is discussed in conjunction with each functional area.

Personnel outside the Command Center are generally on duty 5 days a week; their shifts vary somewhat in length with an average of 8 hours. Five teams of Command Center personnel serve on 12-hour shifts and rotate on a 3-days-on, 4-days-off basis. They also rotate between the AM (6 a.m. to 6 p.m.) and PM (6 p.m. to 6 a.m.) shifts. Where there

Table 1
Sources of Baseline Data

	Questionnaires	1977		1978	
		Checksheets		Checksheets	
		Persons	Days	Persons	Days
Branch					
Action Officers	20	6	37	29	147
Clerical	6	6	27	5	32
Command Center					
CCWT Duty Officers	9	13	43	12	54
CCWT Clerical	3	5	14	5	13
JRC Watch Officers	5	3	9	4	16
Administrative					
Division/Branch	4	4	34	4	26
Directorate (J301)	5	Observation Used			
Communications Center					
Message processing data taken from existing records.					

Notes: In addition to individual checksheets, records were collected for readboard usage and Command Center message recalls.

are interesting differences in responses between the shifts, these will be noted. Otherwise, data for the shifts are combined.

COLLECTION PROCEDURES

Questionnaires, checksheets, and observation were the primary methods used to collect data. (Questionnaires and checksheets are appended to the Test Procedures, reference 2.) In addition, some interviews and examination of records took place.

The data collection took place during several periods between March 1977 and April 1978. An exercise was scheduled to take place during March 1977; however, J3 participation in the exercise was limited, so very few data were collected for the exercise.

Questionnaires were distributed to 80 of the people who would be trained to use the computer system for message handling. Fifty-two of the 67 questionnaires returned contained usable data. (The unusable questionnaires contained answers that were incomplete or expressed in ranges too wide to be categorized usefully.)

The questionnaire asked personnel to report their average level of effort on various message-handling tasks. Most of the questions dealt with ordinary, day-to-day activities; however, a few of the questions did refer to crisis and exercise conditions.

To supplement the questionnaire data, checksheets were distributed to personnel participating in the experiments with the exception of the Administrative Section (J301). The purpose of the checksheets was to record daily measures of message-related activities over a 2-week period. Checksheet data provided in March-April 1977 did not provide sufficient information, so the effort was repeated with revised checksheets in March-April 1978. After this second round of checksheets, sufficient data were available to draw conclusions about daily message usage patterns. The Command Center checksheet data are of special interest, because these checksheets included some message-handling tasks not covered in the questionnaire.

In the Administrative Section, instead of using checksheets, message-processing activities were observed, and records kept. (The observation was accomplished between 21 March and 3 April 1977.) Various categories

of messages were counted, message sorting was observed and timed, and estimates were obtained of the time required for certain other activities related to message handling. The resulting data provide an overall record of current message load within the directorate. Most of these data are reported in section 3, Message Distribution, of this report.

In the Communications Center, data were obtained from time stamps routinely put on messages as they are processed. No individuals were observed; no questionnaires were administered.

The data collection techniques precluded recording individual message characteristics. Some questions about message characteristics were asked, but the responses dealt with typical messages rather than specific messages. When individual messages, personnel, or situations were observed and recorded, results of the observations are specifically identified.

PRESENTATION OF DATA

The collected data reflect great variability among the message-handling activities of the various personnel. This is true not only among job categories but also within a category. While any one action officer may receive, create, or coordinate on about the same number of messages from day to day or week to week, the number of messages to be handled varies from officer to officer. The most important factor in determining message-related activities is the division or branch to which the person belongs.

The data collected often do not follow a normal distribution; i.e., they do not cluster around a central value (or mean) and taper off to extreme values. Instead, the data values tend to be evenly distributed

between extremes or to form several clusters around different values. These data clusters generally correspond to the branches to which the personnel are assigned. Officers in one branch or set of branches give responses that form one cluster, while officers in another set of branches give responses that form another cluster. The branches have been categorized according to incoming message load with questionnaire and checksheet responses grouped in the category appropriate to the individual's branch. Many of the data presentations are histograms, showing the frequency of the mean values that occur within a category. In some cases, all data collected are not reported; the reported data describe typical levels of activity for different organizations. In other words, if some officers in a branch report very little message creation, discussions of message creation will center on those officers who do write outgoing messages.

For some days data were reported for all the tasks of interest; on other days data were reported for only some of the tasks. Because it could not be determined in many cases whether lack of data meant lack of activity for a task or lack of reporting that activity, it was difficult to determine how the means should be calculated. It was decided to calculate mean levels of activity on the basis of the days for which that task was reported. In cases where this may lead to inflated activity levels, means were also calculated on the basis of all the days for which data were provided; these cases are mentioned or presented to help avoid misinterpretation of activity levels. For example, in the case of incoming message review, officers who provided data provided message review data on virtually all of their checksheets. For message retrieval, no data were reported by several officers for several days. Thus, when looking at retrieval activity,

one can look at one table to evaluate the characteristics of retrieval and at another table to evaluate the overall level of retrieval in relation to other tasks.

SECTION 3

MESSAGE DISTRIBUTION

COMMUNICATIONS CENTER

Messages are received at the Local Digital Message Exchange (LDMX) in the Communications Center throughout the day and night. The LDMX assigns a processing sequence number (PSN), orders the messages by precedence (Emergency, Flash, Immediate, Priority, Routine), puts a local date-time-group (DTG) indicating time of receipt on each message, determines distribution, and prints it out. As each message is printed, a clerk checks to see that it is complete (has the proper header fields and correct number of pages of text, is really intended for CINCPAC, etc.). Some messages arrive in sections; the clerk holds such a message until all the sections have arrived.

(Top Secret messages are printed, sorted, and distributed separately from the other messages. Distribution is not determined automatically by the LDMX, but is handled by the clerk.)

Messages are then separated according to precedence and placed in trays. If the message is of Immediate or higher precedence, it is called to the attention of the person operating the off-line printer. (These high precedence messages are also printed directly at the Command Center, where fast action can be taken if necessary.) He takes messages from the trays in order of precedence, makes multiple copies of each message, and gives them to a sorter.

The sorter takes the multiple copies of each message, puts an appropriate number of copies into pigeonholes for each directorate on the address list, and puts a date-time stamp on the file copy.

Precedence, classification, LDMX time, Communications Center time, and several other characteristics were recorded for incoming J3 action and info messages on April 9 and April 29, 1977. The difference between the LDMX DTG (LDTG), i.e., time of receipt (TOR) at the LDMX, and the time stamped by the Communications Center sorter was calculated to give a measure of the Communications Center processing time for each message. The results (see table 2) show that there is indeed a correlation between message precedence and processing time. The higher the precedence of the message, the more quickly it is processed by the Communications Center. (Analysis of the differences showed them to be statistically significant with less than a 1 percent probability of chance occurrence.)

Table 2
Correlation of Incoming Message Precedence and Communications Center Processing Time

Precedence	N	Mean Processing Time (minutes)	Range (minimum-maximum)
Emergency	5	1.8	1-5
Flash	2	3.0	1-5
Immediate	53	24.4	1-84
Priority	147	57.5	5-346
Routine	49	76.3	18-274

J3 ADMINISTRATIVE SECTION (J301)

Admin Section clerks pick up messages from the Communications Center, sort them, make preliminary action assignments to action and J3 info messages, and put them in mailboxes for pickup by division and branch clerks. The Admin clerks also deliver messages directly to some divisions and branches.

Message Categories

Action and J3 info messages are the primary concern of J3 operations. These are messages for which J3 has been assigned responsibility. Action messages usually require some response, which may be another message, a report, a telephone call, etc. J3 info messages may not require any immediate action on the part of the officer, but an officer assigned to a J3 info message is responsible for knowing the contents of the message and may be asked in the future to draw on information the message contains. For convenience, since both types of messages imply responsibility for the recipient, throughout the rest of this report both types of messages will be referred to as action messages.

Other messages provide an information context to help guide action decisions. J3 receives copies of a large number of messages that are information for other divisions of CINCPAC. J3 does not have responsibility for these info messages. J3 also receives operation reports (OPREPS). Under normal conditions, this message category is quite small, but it expands considerably during periods of crisis or hostile action.

Another category of information messages, the Foreign Broadcast Information Service (FBIS), are excerpts of news reports. Although FBIS messages may be quite numerous in any batch, they do not add any

significant burden to J3 message handling. Only one copy of each message is received and is passed directly to the J301 section head for review. The section head discards some and passes the remainder to the J3 Executive Officer (J30A). (J30A reviews messages and passes some along to the Director.) None are distributed to the divisions or branches, and none are retained in J301 message files.

Several kinds of messages require special handling. For Special Category (SPECAT) messages, only one copy is received from the Communications Center. J301 reproduces one copy of each SPECAT for its files and delivers the original to the J30A for him to review and give to the Director. When the original is returned to J301, it is filed with its duplicate in the message vault.

Multiple copies of Top Secret messages may be received. The disposition (e.g., filed, destroyed, or forwarded) of all copies must be recorded, using separate log books for each division and branch. Top Secret messages distributed to the divisions and branches are reviewed there; most are returned to the J301 message vault for secure filing, although some are kept in the division and branch files.

A third category of message, those designated for controlled routing or for limited distribution (LIMDIS), are handled using procedures similar to those used for Top Secret messages. Controlled distribution and LIMDIS messages are not necessarily classified for security purposes, but their multiple copies are logged in their distribution to divisions and branches. Thus, in terms of message handling, Top Secret, controlled distribution, and LIMDIS messages impose similar demands for special treatment.

Message Count

A record of the size of each message batch during the 2-week observation period is provided in table 3 with subtotals for action, info, and OPREPS. Included in the action category are some comback copies of messages originating in J3, but most are messages received from other agencies. Table 3 shows that message load varies somewhat with the day of the week with a reduced flow on the weekend. There seems to be some end-of-the-week increase in message traffic on Fridays.

Within each day, there is some variation in message count from batch to batch, partially related to the pickup schedule. The data indicate a fairly steady flow of messages to J3 throughout the work day (during the week) at an average rate of about 10 to 15 per hour. There is a moderate increase during the evening hours, shown in the relatively greater size of the 0100 message batch, presumably the result of increased traffic from the Western Pacific, and some catch-up or reduction of backlog in the Communications Center.

J301 processes over 2,000 messages per week, including approximately 39 percent action messages, 57 percent information, and 4 percent OPREPS.

This message count does not include messages requiring special handling, i.e., SPECAT, Top Secret, and LIMDIS. There are relatively few messages in these categories, averaging only about 15 to 20 per week.

The record provided in table 3 also does not include FBIS messages. These are quite numerous, averaging almost 200 per day, but as noted earlier, they do not impose any significant burden on J3 message distribution and filing.

Table 3
J301 Message Load

Batch Date	Time	Message Type			Total	Batch Date	Time	Message Type			Total
		Action	Info	Oprep				Action	Info	Oprep	
3-21 Monday	0100	*				3-28 Monday	0100	73	67	6	146
	0500	*					0500	6	19	0	25
	0700	105	75	12	192		0700	4	12	0	16
	0900	10	13	3	26		0900	6	5	1	12
	1100	19	13	2	34		1100	3	18	0	21
	1300	16	15	0	31		1300	14	14	0	28
	1500	17	20	5	42		1500	13	20	0	33
	Total	167	136	22	325		Total	119	155	7	281
3-22 Tuesday	0100	*				3-29 Tuesday	0100	59	108	10	177
	0500	*					0500	7	16	2	25
	0700	80	136	6	222		0700	12	12	0	24
	0900	17	29	0	46		0900	9	12	2	23
	1100	18	14	0	32		1100	11	7	3	21
	1300	5	9	1	15		1300	13	20	0	33
	1500	15	9	0	24		1500	11	22	2	35
	Total	135	197	7	339		Total	122	197	19	338
3-23 Wednesday	0100	*				3-30 Wednesday	0100	68	115	8	191
	0500	*					0500	12	18	2	32
	0700	68	110	7	185		0700	12	15	1	28
	0900	32	53	4	89**		0900	8	10	0	18
	1100	14	16	0	30		1100	6	14	0	20
	1300	23	16	2	41		1300	13	14	0	27
	1500	10	21	0	31		1500	14	34	0	48
	Total	147	216	13	376		Total	133	220	11	364
3-24 Thursday	0100	45	73	7	125	3-31 Thursday	0100	40	77	5	122
	0500	20	45	5	70		0500	6	17	3	26
	0700	14	23	1	38		0700	9	14	0	23
	0900	9	7	1	17		0900	18	12	0	30
	1100	9	6	2	17		1100	14	8	2	24
	1300	10	17	2	29		1300	7	15	1	23
	1500	19	23	1	43		1500	14	29	0	43
	Total	126	194	19	339		Total	108	172	11	291
3-25 Friday	0100	87	141	8	236	4-01 Friday	0100	51	123	8	182
	0500	11	39	0	50		0500	8	37	2	47
	0700	7	13		20		0700	10	12	0	22
	0900	8	8	1	17		0900	7	14	0	21
	1100	10	5	0	15		1100	1	2	0	3
	1300	16	18	0	34		1300	7	11	0	18
	1500	17	19	0	36		1500	10	19	3	32
	Total	156	243	9	408		Total	94	218	13	325
3-26 Saturday	0100	44	116	6	166	4-02 Saturday	0100	62	129	10	201
	0500	28	21	2	51		0500	25	26	0	51
	0700	7	10	0	17		0700	7	9	0	16
	1000	11	10	1	22		1000	7	13	0	20
	Total	90	157	9	256		Total	101	177	10	288
3-26 Sunday	0700	86	66	8	160	4-03 Sunday	0700	57	47	6	110
Total for week		907	1209	87	2203	Total for week		734	1186	77	1997

* Record combined with that for 0700 batch.

** System failure in the Communications Center created a message backlog, so this 0900 batch is considered larger than usual.

Message Pickup

During the week, the J301 message clerk collects batches of messages from the Communications Center seven times daily at 0100, 0500, 0700, 0900, 1100, 1300, and 1500 local time. (Actual pickup may be somewhat earlier than these nominal times.) On Saturday four collections are made at 0100, 0500, 0700, and 1000. On Sunday there is only one collection at 0700. The Communications Center is in a different building, and each collection of a message batch takes approximately 10 to 15 minutes. (On their questionnaires, J301 personnel indicated they spend anywhere from 1 to 4 hours a day picking up and delivering messages and other materials.)

Message Sorting

Message batches are brought back to the J301 message vault for sorting, distribution, and filing. This process involves several steps. First, there is a rough sort in which information messages (seven copies of each) are distributed into files for the different divisions and branches, and action and J3 info messages (nine copies of each) are set aside for further attention. (The number of copies provided changes frequently. These numbers represented copies provided in March-April 1977.) FBIS messages are put aside for review by the section head.

In a subsequent fine sort, action messages are assigned to particular branches with the J301 and branch copies stamped accordingly. If a proper assignment is not explicit in the message itself, it can usually be determined from the topic of the message. In doubtful cases, the clerk may refer to a card file of projects and topics, indicating the special interests and responsibilities of each branch or office. Or the clerk might look up a referenced message to find what office had previously had action responsibility.

throughout the day, rather than in scheduled batches, making it difficult to determine exactly how much time is spent on distribution. This task tends to be interspersed with other tasks.)

Command Center Duty Officers

Duty officers are involved in distribution of high precedence messages; in addition to distribution of these messages, they handle readdressal, opening, and notification tasks. Readdressal occurs when the duty officer decides that an organization outside of CINCPAC should have been included on the message distribution list, and so he adds that organization to the address list. The readdressal is sent to the Communications Center, and the message forwarded to the new addressee. "Opening" occurs when the duty officer decides that a division or branch within CINCPAC should have received the message, and so he adds that division or branch to the address list. Additional distribution of the message is processed, so the new addressee will receive a copy of the message. Notification occurs when an especially important or interesting message arrives. The duty officer notifies the action addressee that the message has arrived, so that he can come to the Command Center for a copy or be on the lookout for its delivery. (If the action officer is not on duty, i. e., it is late at night, the duty officer telephones him so that he can consider returning to headquarters to handle the message.)

The amount of time a duty officer spends on these tasks varies according to his assignment. The Duty Director of Operations (DDO) does not generally distribute messages, although he may readdress or open a message. He also notifies action officers if a message of special interest arrives. During the days that checksheet data were collected, DDOs reviewed an average of 140 messages a day but distributed (including opening,

COMMAND CENTER

Message Handling Procedures

Outside of the Command Center, action officers are not ordinarily involved in message distribution. They may decide to forward a message to someone else or to sell a message, but distributing messages is not a major part of their duties. Distribution is handled by the Admin Section, by division and branch administrative, and clerical personnel with decisions made by the division and branch chiefs on action assignments influencing distribution.

The Command Center is quite different. Messages are delivered to the Command Center directly via pneumatic tube from the Communications Center or printed in the Command Center in concurrence with the LDMX printout. CCWT clerks distribute messages within the Command Center to the appropriate duty officers. These duty officers are responsible for ensuring that urgent messages reach the action officers quickly; thus, the duty officers perform a number of tasks related to distribution. These tasks, and the time spent on them, are described below.

Command Center Clerical

Messages of Immediate or higher precedence are printed out in the Command Center when they are received at the LDMX in the Communications Center. Three copies of each message delivered via pneumatic tube are given to the Air Desk, and four copies to the Surface Desk. High precedence messages arriving on the printer are given to the appropriate duty officer.

Checksheet data show that between 300 and 400 messages are usually distributed during a watch; the times reported to handle these distribution tasks averaged from 1.5 to 3.5 hours. (The messages arrive continuously

A division office with a moderate load (60 messages per day) had a somewhat different pattern of distribution tasks. In this office very little time was reported for message pickup. Sorting also took the most time in this office with delivery taking only a small amount of time.

In the lightly loaded (seven messages a day) division office, the greatest amount of time was spent on message pickup. This office is located on a different floor from the others and does not have messages delivered to it by J301. Message pickup thus accounts for the largest proportion of time taken for the distribution tasks.

Most of the branch clerical personnel reported little or no message distribution effort. The bulk of this work is accomplished in the division office. One branch clerk, whose offices are not located near the division office, reported a heavy message load (200 messages per day) and times similar to those reported by the heavily loaded division office. In a moderately loaded (90 messages per day) branch office near the division office, little distribution effort was required, and pickup and delivery took only a few minutes each day.

The times reported in the checksheets are consistent with those reported on the questionnaires, when administrative and clerical personnel were asked how much time they spent on message distribution tasks.

These data show how message distribution effort is affected by message load, office location, and office procedures. While a computer-aided system may reduce the message pickup and delivery effort, it will not eliminate it. The administrative and clerical personnel will still need to pick up and deliver letters, memos, and other nonmessage materials.

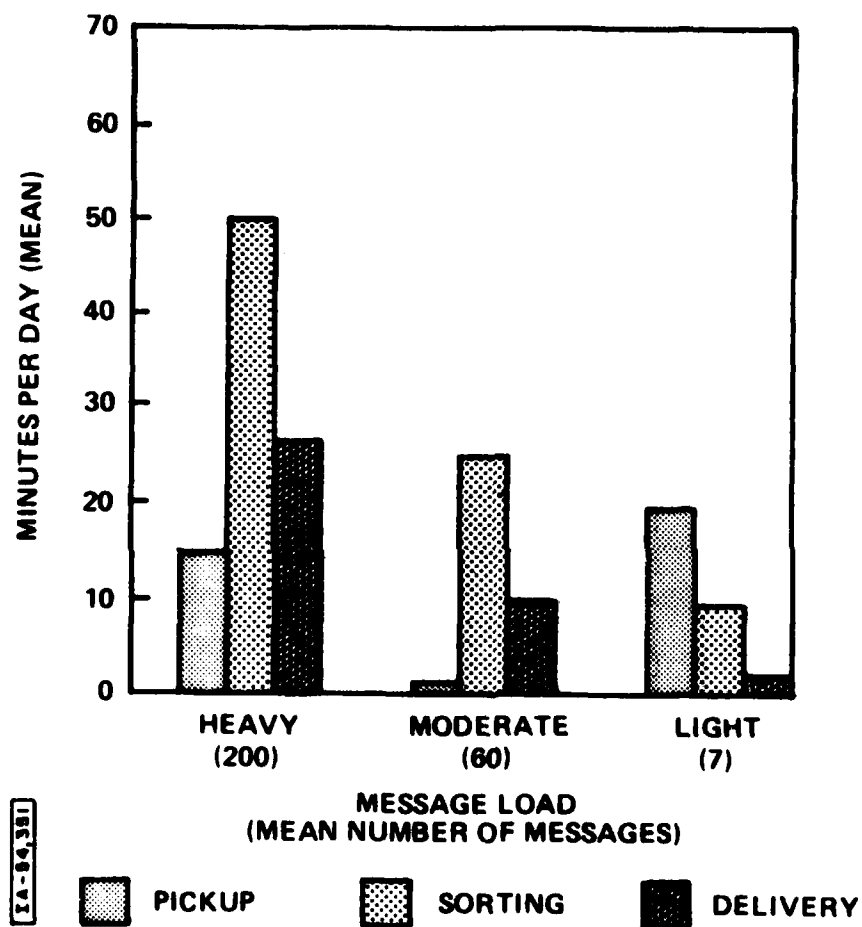


Figure 3. Division and Branch Administrative Personnel Daily Message Distribution Effort (Checksheet Data)

requiring J3 action or response. During the period 11 February through 22 March 1977, the average number of items in the Daily Digest was 28, ranging from 24 to 33. Of these items, an average of seven were messages, ranging from four to 11, comprising 25 percent of the Digest listings.

A current copy of the Digest is maintained in the Admin Section and annotated periodically to show item completions, as different items are dealt with by message, memo, or other communications from the responsible J3 branches and offices. This update process is estimated to take an aggregate of 60 to 90 minutes each day.

DIVISION AND BRANCH CLERICAL

When messages arrive at the division or branch office (either through J301 delivery or after being picked up by the clerks), the division and branch administrative clerks become responsible for their further distribution. The amount of time these personnel spend on message distribution tasks is a function of their duties (administrative or clerical), the division or branch message load, and the office location.

Checksheet data were obtained from division and branch administrative and clerical personnel in several areas (see figure 3). The administrative head in a division office with a heavy message load (averaging 203 messages a day) spent an average of 90 minutes each day picking up, sorting, and distributing messages. (The bulk of this division's messages are delivered to the division office by J301, but the first batch each day is picked up at J301 by the division administrative head.) Most of the time, however, was spent sorting messages for further distribution within the division office and to its branches. This activity involves some decision-making as well as simple sorting.

More often, sell transactions will be initiated by a J3 action officer, who will request the message clerk to arrange the transfer of action and J3 info responsibility to another directorate. This may happen four to 10 times per day. If the action officer has already negotiated the sell transaction, the message clerk may be able to confirm this with a single telephone call, after which he completes a record form for delivery to the Communications Center, requiring no more than 1 or 2 minutes. On other occasions, however, the clerk may have to make a number of calls, trying to track down the appropriate action officer in another directorate, who will agree to "buy" the message. If that officer is unavailable for any reason, the transaction can drag on for hours.

In the converse process, when a J3 action officer agrees to buy a message, he may call J301 to notify the message clerk of that transaction. If he does not, then the message clerk will discover the transaction later when he receives a revised copy of the message from the Communications Center. J301 personnel estimate that J3 buys messages at a rate of three to five per day.

The message clerk is also involved in buy and sell transactions between different offices within the J3 directorate. For each message when action responsibility is reassigned, the clerk fills out a form and annotates the J301 file copy of the message accordingly. It is estimated that on the average four to five such transactions occur per day.

Other activities of the message clerk involve retrieval of old messages on request, either from J301 files in the vault or from the Communications Center. Such requests involve only a few messages each day.

One responsibility of the Admin Section, not handled by the message clerk, is maintaining the Daily Digest, a listing of various pending items

Table 7
J3 Action Message Assignment with Recipients Ranked by Percent Messages Assigned

Rank	March* (Div/Br)	Percent	September-October (Div/Br)	Percent	Change in Rank
1	313	(27.7)	37	(21.4)	+ 1
2	37	(14.4)	313	(20.3)	- 1
3	314	(11.9)	334	(13.1)	+ 4
4	332	(7.2)	332	(9.3)	0
5	35	(7.1)	311	(7.6)	+ 1
6	311	(6.5)	314	(6.1)	- 3
7	334	(6.3)	35	(4.6)	- 2
8	32	(3.7)	36	(4.0)	+ 2
9	ABNCP	(3.4)	32	(2.7)	- 1
10	36	(2.8)	ABNCP	(1.9)	- 1
11	333	(1.8)	33	(1.7)	+ 4
12	315	(1.7)	315	(1.6)	0
13	312	(1.6)	333	(1.3)	- 2
14	316	(1.4)	316	(1.3)	0
15	33	(1.2)	312	(1.1)	- 2
16	34	(0.7)	31	(1.1)	+ 1
17	31	(0.1)	34	(0.9)	- 1

* J77 omitted.

four from week to week, presumably reflecting different stages of involvement in the planning and conduct of military maneuvers.

The data in table 6 reflect some changes in distribution procedures made between March and September. For example, J301 stopped distributing messages to J77, and the responsibility for some message subjects was changed. Note, however, that J313 and J37 still received over 40 percent of the action messages assigned to J3. J37's load also varied considerably during September-October, rather than remaining stable as in March-April. In general, however, the divisions and branches received relatively the same proportion of messages during both periods. In table 7 the divisions and branches are ranked according to the percent of messages assigned. The top six branches remained the top six, although their positions changed within those ranks.

It should be noted that minor discrepancies between the values in table 5 and those in table 3 may be attributed to differences in counting messages grouped by date of origin (DTG) and messages received on a particular date.

Other Message-Related Activities

While scanning messages, occasionally the clerk will notice an obvious instance in which action responsibility has been assigned to J3 by mistake. In such a case, the message clerk may contact appropriate administrative or branch personnel in another directorate and arrange to "sell" that message, thus saving unnecessary subsequent effort by J3 action officers. J301 personnel estimated that this kind of error correction occurs two or three times on an average day.

Table 6

J3 Action Message Assignment for September-October 1977

Division/Branch	Sept 12-18	Sept 19-25	Sept 16-Oct 1	Oct 2-9	Oct 10-16	Oct 17-23	Percent of Total
J31 Current Ops Div	4	6	30	2	2	1	1.1
J311 Air Ops	30	50	43	46	67	89	7.6
J312 Ground Ops	2	11	12	6	6	9	1.1
J313 Naval Ops	150	123	152	170	137	132	20.3
J314 Recce Ops (JRC)	53	41	47	40	32	45	6.1
J315 EW Ops	16	9	16	10	10	7	1.6
J316 Ops Security	14	8	9	9	6	11	1.3
J32 Nuc Ops/Safety Div	16	26	23	14	11	24	2.7
J33 Cmmnd & Control Div	8	10	13	15	15	10	1.7
J332 Trng & Procedures	87	78	76	68	44	44	9.3
J333 Command Center	2	1	12	7	17	17	1.3
J334 For Stat & Ops Reporting	84	120	93	78	95	85	13.1
J34 Tech Req & Eval Div	4	6	6	7	7	8	0.9
J35 Exercise Div	27	36	39	36	21	38	4.6
J36 Spec Proj Div	35	36	2	22	10	23	4.0
J37 Geophysics Div	175	232	84	157	104	157	21.4
ABNCP	15	11	21	16	10	8	1.9
Total	722	804	718	703	584	708	100

Table 5
J3 Action Message Assignment for March-April 1977

Division/Branch		March 14-20	March 21-27	March 28-April 3	Percent of Total
J31	Current Ops Div	1	1	2	0.1
J311	Air Ops	76	45	58	6.5
J312	Ground Ops	18	20	6	1.6
J313	Naval Ops	347	269	151	27.7
J314	Recce Ops (JRC)	152	94	84	11.9
J315	EW Ops	25	8	14	1.7
J316	Ops Security	13	15	12	1.4
J32	Nuc Ops/Safety Div	32	31	38	3.7
J33	Cmd & Control Div	12	11	10	1.2
J332	Trng & Procedures	71	81	47	7.2
J333	Command Center	5	25	19	1.8
J334	For Stat & Ops Reptng	66	59	49	6.3
J34	Tech Req & Eval Div	5	7	7	0.7
J341	Cmd Control Sys	1	0	0	0
J342	Tech Req & Eval	1	0	0	0
J35	Exercise Div	123	44	29	7.1
J36	Spec Proj Div	53	12	13	2.8
J37	Geophysics Div	126	134	139	14.4
J77	Res & Analysis	1	8	3	0.4
ABNCP		29	37	28	3.4
Total		1,157	901	709	99.9

Another factor that can delay sorting is in the filing process. Most messages are filed by hour of the current day, which requires only about 1 second apiece. An occasional message will represent a revision of some older message, requiring the clerk to take down a previous day's message folder, find the old message by its DTG, and substitute the revised version, a process which takes about 1 minute on the average.

Message Assignment

Because it is the action messages that primarily affect the J3 workload, a particular effort was made to determine how many action messages are assigned to different groups in the J3 organization. J301 message files were scanned to count action messages assigned to each division and branch. One count began with the week of 14 March 1977, when the survey questionnaires were distributed, and continued for the weeks of 21 March and 28 March 1977. The results of this count are recorded in table 5. A second count began 12 September 1977 and continued through 23 October 1977. The results of this count are presented in table 6.

In these records it can be seen that different groups differ markedly in the number of action messages they handle. For example, during the 3-week observation period in March, J313 Surface (Naval) Ops Branch dealt with more than 250 action messages per week, about 28 percent of the total J3 message load. By contrast, J311 Air Ops Branch handled 60 action messages per week, and J312 Ground Ops Branch only 15.

For some groups, the message load seems quite stable during March. J37 Geophysics Division received about 130 action messages per week, presumably reflecting a quite steady flow of weather reports. By contrast, the message load in the J35 Exercise Division fluctuated by a factor of

In that record, it can be seen that the time varies with the number of messages involved with an average time ranging from one-half to 1 minute per message from batch to batch. (The correlation between batch sorting time and batch size is 0.94, which is statistically significant with less than a 1 percent probability of chance occurrence.) Although there is a tendency for the time per message to decrease slightly with increased batch size, there is no statistically significant correlation between batch size and per message sorting time.

The recorded figures do not include time consumed by occasional interruptions of the message clerk during his sorting task. These recorded figures for speed of message sorting also do not include those occasional messages requiring special handling. Such messages receive separate attention in their distribution and filing. Thus, a batch of 40 normal messages might be sorted and distributed in 20 minutes, but another 4 to 5 minutes might be taken to deal with just one special category message.

Overall, the average sorting time is about 45 seconds per message, ignoring FBIS messages and not including interruptions and time spent on special category messages. About 13 seconds per message are spent in the rough sorting, 14 seconds in fine sorting, 5 seconds in distribution to mail boxes, 9 seconds in highlighting, and 4 seconds in filing.

Any particular message might take longer. If the message clerk does not recognize the subject of a message and must refer to files to determine proper branch or office assignment, this will delay the sorting process. The average time estimates cited here are based on observation of experienced personnel; someone new to the job would take longer. Experienced J301 personnel estimated that a new message clerk would need about 2 weeks to learn the branch and office subject assignment categories.

Table 4
J301 Message Sorting Time

Batch Time	Total Messages	Minutes						Min per Message
		Rough Sort	Fine Sort	Dist.	Highlight	File	Total Time	
3-21								
0900	26	6	9	1	5	2	23	0.88
1100	34	8	8	1	5	1	23	0.68
1300	31	3	5	1	4	1	14	0.45
1500	42	13	8	3	7	2	33	0.79
3-22								
0900	46	8	17	4	7	2	38	0.83
1100	32	6	7	4	5	1	23	0.72
1300	15	—	—	2	4	1	—	—
1500	24	8	5	2	5	3	23	0.96
3-23								
0900	89	19	18	5	12	5	59	0.66
1100	30	7	5	2	4	7	25	0.83
1300	41	5	8	3	2	2	20	0.49
1500	31	5	6	5	6	2	24	0.77
3-24								
0900	17	5	4	2	3	1	15	0.88
1100	17	3	7	2	3	1	16	0.94
1300	29	—	—	—	—	—	—	—
1500	43	10	10	2	7	2	31	0.72
3-25								
0900	17	3	4	2	3	2	14	0.82
1100	15	3	4	2	3	1	13	0.87
1300	34	8	7	2	6	2	25	0.74
1500	36	7	7	2	7	3	26	0.72
Overall *	605	127	139	45	94	40	445	0.74
Percent of Total		29	31	10	21	9	100	

* Ignoring incomplete record for two batches.

Occasionally, extra copies of a message must be reproduced at this stage, depending upon the message topic and the branches involved.

Once the fine sort is completed, the message files are checked and then distributed to division and branch mail boxes in the J301 office. Another J301 clerk will deliver mail and messages from these boxes to some of the divisions and branches, including J30A, J31, J33, and J37. The clerk makes six rounds a day, averaging 15 minutes per round. Other divisions and branches send their own administrative personnel to J301 to collect messages from their boxes, usually once at the beginning of the work day and again after late morning and midafternoon mail deliveries.

Once the message clerk has distributed messages to the boxes, the next step in the standard procedure is to "highlight" a set of messages for the director's office. Each message is marked to emphasize source, subject, and responsible J3 office. The clerk will eliminate some messages at this point, for example, all those in code. The highlighted messages are then reviewed by the J301 section head, who eliminates approximately half of them (those dealing with routine matters) before delivering the remainder to the J30A.

Finally, the file copies of all messages are sorted in preparation for later filing. This initial file sorting is by hour in the message date-time-group. At the end of the day, messages are sorted by minute within each hour and assembled by DTG in file folders. These daily folders are retained in the vault 1 month for further reference as needed.

Sorting Time

A record of the time required for sorting a number of different message batches observed during the week of 21 March 1977 is provided in table 4.

readdressal, and notification) an average of one a day. The time spent distributing is negligible, involving a telephone call or placement of the message into a pigeonhole for pickup later.

Message distribution activities for the Air Ops and Surface Ops duty officers were scattered with the Air Ops officers opening distribution on seven to 11 messages on two days, one or two messages on several days, and no messages on other days. The time spent on distribution tasks is negligible, involving a telephone call or placing the message in a pigeonhole for pickup later. In general, many messages are scanned very quickly and discarded with relatively few saved or redistributed.

DELIVERY TO ACTION OFFICERS

The time it takes for a message to reach an action officer depends on that message's precedence and the time of day when it arrives in the Communications and Command Centers. If the message is of Immediate or higher precedence, it is printed at the Command Center, where a duty officer reviews it and may notify the officer of the message's arrival. He can then come to the Command Center to pick it up. Time of notification is affected by the time needed to find the officer. The action officer generally receives notification of these messages within an hour of their arrival. If an urgent message arrives out of normal duty hours, the officer may be called to come for the message. (These messages are also processed in the Communications Center, but action officers are notified first by the Command Center duty officers when an urgent message arrives.)

Delivery of Priority and Routine messages depends on their arrival time at the Communications Center. Although Priority messages are processed an average of 20 minutes faster than Routine messages, the advantage of this difference may be lost if the message does not arrive shortly

before pickup by the Admin Section clerks. A message that arrives just after pickup by J301 will take at least 2.5 hours to reach the action officer, and may take 16.5 hours if it arrives after the 1500 pickup. Another message printed at the LDMX, copied, sorted, and picked up in fast sequence may be ready for delivery to the action officer within one-half hour of its arrival in the Communications Center. The actual delivery is further delayed by the procedures used within J3; i. e., messages are delivered by J301 clerks to selected divisions (J30, J31, J33, J37) six times a day, while the other divisions send their clerks to J301 to pick up messages and other mail three times a day. Thus, delivery time is also affected by the particular division the action officer is working in. Unfortunately, it was not feasible to collect data on the actual age of messages as they reached the officers' desks. Some estimates of message age at delivery can be made, based on incoming message processing times.

Table 8 shows the average age of Priority and Routine messages at the scheduled J301 pickup times from the Communications Center. (These numbers represent combined messages from April 9, 1977 and April 29, 1977. Patterns in message age at pickup time were sufficiently similar to justify combining the data.) Age was calculated as the difference between scheduled pickup time and LDMX time of receipt. Age thus includes Communications Center processing time and wait time (time spent in pigeonholes between readiness and pickup).

On the days message ages were calculated, almost three times as many Priority messages were received as Routine messages. Half of these Priority messages arrived before 0700 or after 1500, whereas three-fourths of the Routine messages arrived during these off-duty hours.

Table 8
Average Message Age at Scheduled J301 Pickup from Communications Center

Pickup Time	Age (Minutes)		Messages	
	Priority	Routine	Priority	Routine
0100	309	371	51	31
0500	239	176	25	8
0700	74	202	21	1
0900	116	38	9	1
1100	74	—	20	0
1300	106	184	14	3
1500	103	159	7	8
Overall	190	288	147	52
Day Time (0700-1500)	89	158	71	13

At the time of pickup when all pickups are considered, the Routine messages were an average of 98 minutes older than the Priority messages. (Routine messages averaged 288 minutes old; Priority messages averaged 190 minutes old.)

Most action officers report for duty around 0700, so the capability of a computer system to process messages quickly is of less importance outside duty hours than during the day. Considering message age at the daytime pickups (0700 to 1500), Routine messages averaged about an hour older than the Priority messages. (Routine message averaged 158 minutes old; Priority messages averaged 89 minutes old at pickup.)

For the divisions to which J301 delivers messages, average message age at delivery can be estimated by adding J301 processing time and

delivery time to the message age at pickup. These times would add about 35 minutes (25 minutes for sorting tasks, 10 minutes for delivery) to the ages of both Priority and Routine messages. As shown in table 9, Priority messages would be an average of two hours old when they reach the division, and routine messages would be over 3 hours old. There may be still further delay at the division and branch levels, depending on the decisions that have to be made there to assign an officer to take action on the message.

For the divisions that send clerks to J301 to pick up messages and other materials, message age when delivered to the action officer will on the average be even greater than described above. These divisions send clerks three times a day (early morning, late morning, and midafternoon) to pick up messages from J301. Thus, several hours may pass between the time the messages are ready at J301 and the time they are picked up and brought back to the divisions.

Table 9

**Estimated Message Age When Delivered to Division or Branch
(Incoming Message Processing Times (Minutes) Between 0700-1700)**

Prec:	Emerg.	Flash	Immed.	Priority	Routine
TCC Proc.	3.0	1.8	24.4	57.5	76.3
Wait for Pickup	*	*	*	31.5	81.7
Age at J301 Pickup				89.0	158.0
J301 Batch Proc Time **				25.0	25.0
J301 Delivery Time				10.0	10.0
Age When Delivered to Division or Branch				124.0	193.0

* Distribution of urgent messages handled by phone call by CCWT.

** Batches not sorted by precedence. Average of 33 msgs/batch. Sorting time averages 45 sec/msg.

SECTION 4

MESSAGE USAGE

ACTION OFFICERS

Each day action officers receive and read a number of messages. Some they keep; some they send to other action officers; others they must act on or respond to in some way. The number of messages the officers receive and the time they spend on these messages are more significant measures of the importance of messages to their duties than measures of filing and retrieval activity. (It should be noted that message load is not necessarily a measure of overall workload. Some duties involve more communication via messages than others.)

Action messages are of primary interest to the officers, since they are responsible for taking action on or becoming familiar with the contents of these messages. The contents of an info message may be of interest to the officer, but he has no specific responsibility for that message. He may scan or read the message, keep it for future reference, or discard it.

Recalling the message distribution statistics in tables 5, 6, and 7, the number of action messages that an officer might receive is affected by the division and branch to which he is assigned. Questionnaire and checksheet data confirmed this; there is great variability among officers' message-related activities with patterns evident along organizational lines. (In addition, there are isolated occasions on which several officers reported atypically large or small incoming message loads.)

Differences in the number of info messages that officers read and scan are also affected by an officer's division and branch.

In figures 4 and 5 summarized checksheet responses show three patterns of message review. In the first category, officers reported receiving a moderate number of action messages daily. One officer reported no review of action messages, but is included in this category because another officer in his branch did report moderate activity. With the exception of the former officer, the personnel in category 1 spent an average of 12.5 minutes a day reviewing action messages and reviewed an average of 11 messages a day. In these branches there was also a relatively heavy load of info messages. The officers spent an average of 33.8 minutes reviewing info messages and reviewed an average of 39 messages a day. These numbers describe review of new incoming messages only; they do not describe use of previously received messages. The times describe initial review of the messages; they do not include time spent researching and preparing a reply, for example.

In the second category, few action messages are received (the exception shown in figure 4 is a branch chief), but the info message load is heavy. Officers in this category review an average of 49 info messages and spend an average of 25 minutes daily on this review.

Officers in the third category report little activity with incoming messages. They receive an average of four action messages daily and spend only 5 minutes a day reviewing them. In addition, few info messages are reviewed.

Not all info messages are routed directly to an officer's desk. In some divisions and branches readboards are used. These may be circulated, or they may be left in a central office for an officer to review

at his convenience. During the 1978 period that checksheets were being filled out, log sheets were attached to various division and branch readboards. Again patterns of load and usage were evident. One branch (not included in figures 4 and 5) averaged 100 messages daily on its readboard, and officers spent an average of 26 minutes scanning the readboard. On another division readboard (category 2 of figures 4 and 5) the average number of messages was 11; average time spent was 3.4 minutes. In yet another division the readboard was reviewed by the deputy division chief; he spent an average of 40 minutes scanning messages. There was an average of 71 messages on the readboard. (This officer was responsible for calling information to the attention of the division chief, as well as tracking information of interest to other members of the division.)

These patterns of incoming message review are also evident in questionnaire responses. Two-thirds of the respondents reported reviewing 10 or fewer action messages daily with most reporting less than five a day. The number of info messages reported covered a wider range, but most said they reviewed 20 or less a day. These numbers are somewhat higher than the checksheet data show and may reflect the variance in message activity, which can occur if an officer becomes involved in a current activity.

According to comments from the officers and casual observation of their message usage, info messages are usually scanned very quickly with some pauses for reading a message of interest. For most messages, the officer glances at subject, sender, and perhaps a few lines of text to decide if the message is of interest. Action and J3 info messages are read more carefully than info (general CINCPAC) messages, but most of the time and effort goes into the response or subsequent actions that action messages require.

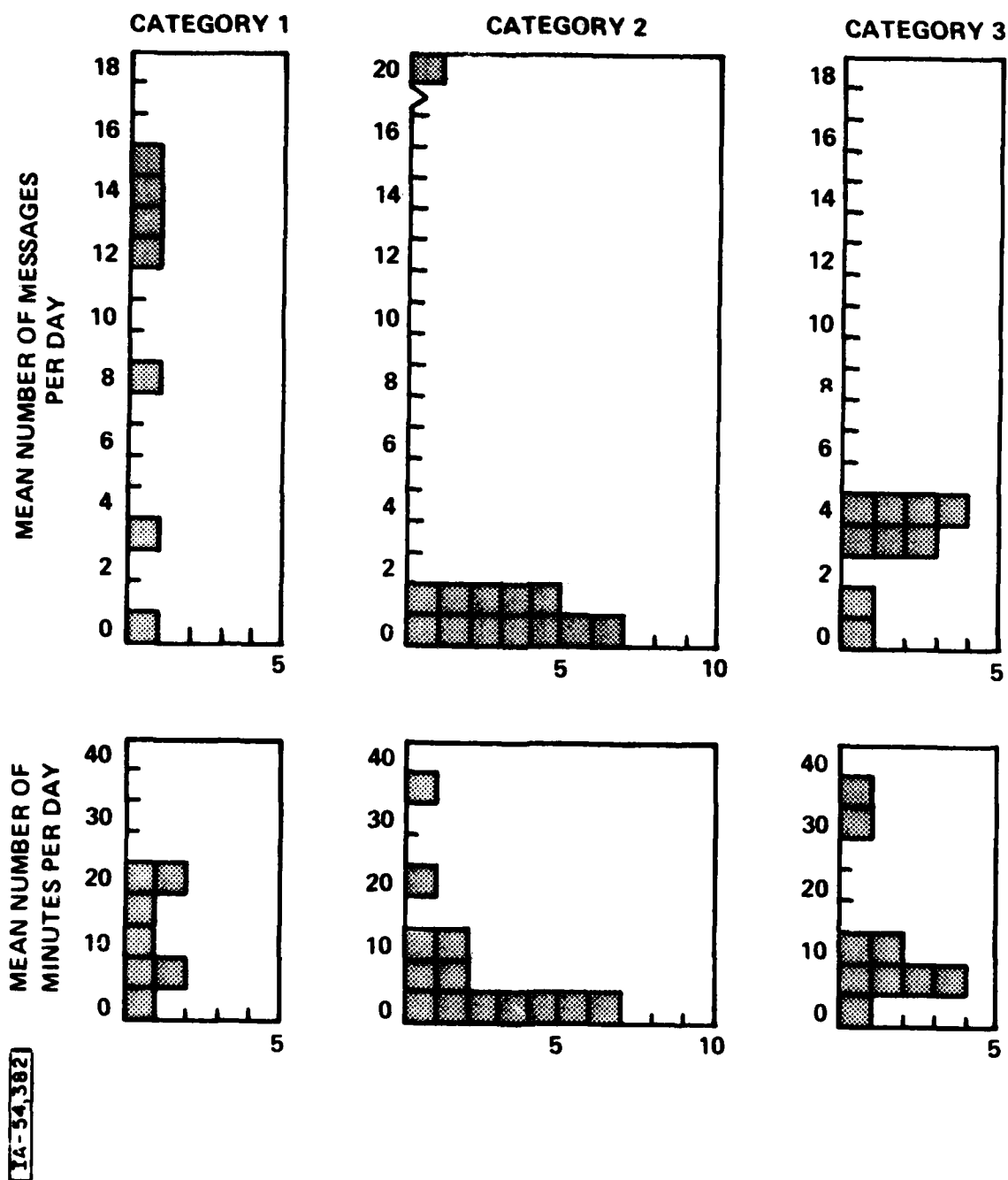


Figure 4. Incoming Action Message Review by Action Officers
(1978 Checksheet Data)

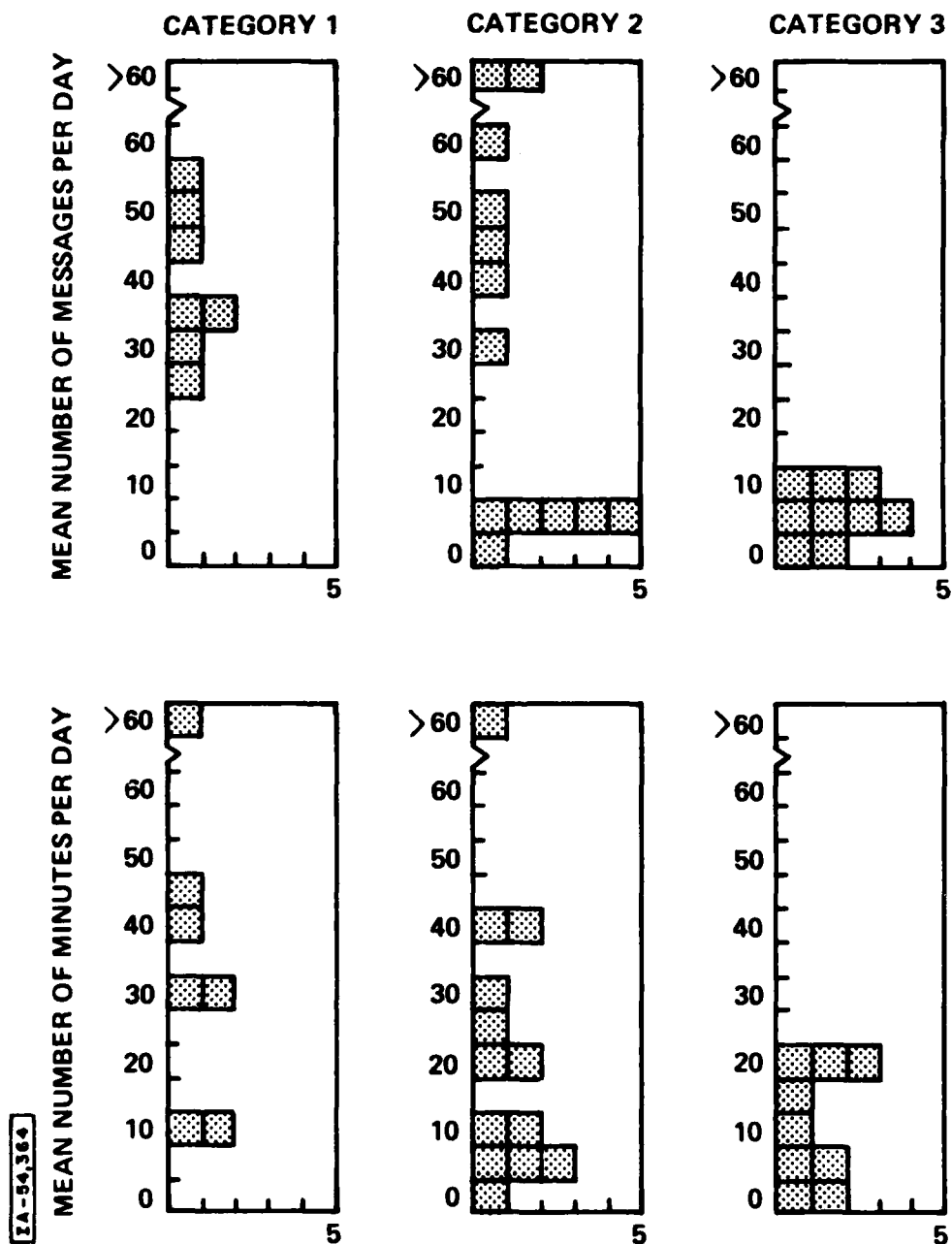


Figure 5. Incoming Info Message Review by Action Officers
(1978 Checksheet Data)

JRC WATCH OFFICERS

The Joint Reconnaissance Center (JRC) is located within the Command Center area. It is staffed 24 hours a day, 7 days a week. There is one watch officer (who is also a member of J314) on each 12-hour shift.

The LDMX may add the JRC to a message's distribution; these messages are sorted and distributed by J301 along with the other messages J301 handles. Messages assigned to J314 may also be sent to the JRC by J314. In addition, because of his location, the JRC watch officer may get messages off the Command Center printer.

The JRC handles a relatively heavy message load (figure 6). Although the load is lighter than that of the CCWT, the JRC watch officers receive more messages (and spend more time on them) than the other branches. About one-third of the load is composed of messages for which the watch officer is responsible (figure 7). Thus, in terms of their duties and incoming message-handling needs, the JRC can be considered to be like a branch with a heavy load, rather than like the CCWT.

COMMAND CENTER DUTY OFFICERS

The Command Center Watch Team (CCWT) is assigned action by J301 on less than 2 percent of J3's action messages (tables 5, 6, and 7). They do, however, receive directly from the LDMX messages addressed to the DDO; they also monitor all the incoming action and J3 info messages for J3, so that they can alert the appropriate staff when an Immediate or Flash precedence message arrives, or build a file on a developing situation.

Checksheet data provided by the CCWT duty officers show different patterns of daily message review among desks. It is apparent from these data, presented in figures 8 and 9, that the DDOs generally spend less

time and review fewer messages than the Air and Surface Ops duty officers. The DDOs also show the greatest amount of variability among individuals. One duty officer commented that some DDOs prefer to review most of the incoming messages themselves, while others rely on the Air and Surface Ops duty officers to screen messages and pass along those of special importance or interest. The data support this comment. Several DDOs reported reviewing an average of 24 to 56 messages daily, while others reviewed 100 to 260 messages themselves. Note, however, that even when many messages are reviewed, relatively little time is spent. Many messages are scanned very quickly to determine if they are of interest; only a few are read carefully.

The Air Ops duty officers are responsible for reviewing messages for the Director's readboard; therefore, they tend to spend more time and review more messages than the Surface Ops duty officers. However, there is not a great deal of difference between these two desks. The average number of messages reviewed by Surface Ops duty officers ranged from 186 to 320; average times ranged from 59 to 104 minutes daily. For the Air Ops desk, average number of messages ranged from 110 to 476; average times ranged from 32 to 200 minutes daily. As with the DDOs, the highest times do not necessarily correspond to the greatest numbers of messages. Many messages may be scanned quickly with only a few read carefully, and individual styles vary.

CCWT replies to the questionnaire also showed considerable variability among officers. There were not enough responses to summarize usefully; however, all responses were within the ranges shown by checksheet data.

Comparing the message activities of the Command Center duty officers with those of the other action officers, we see that the duty officers handle a much higher volume of incoming message traffic and spend more of their day on message-related activities.

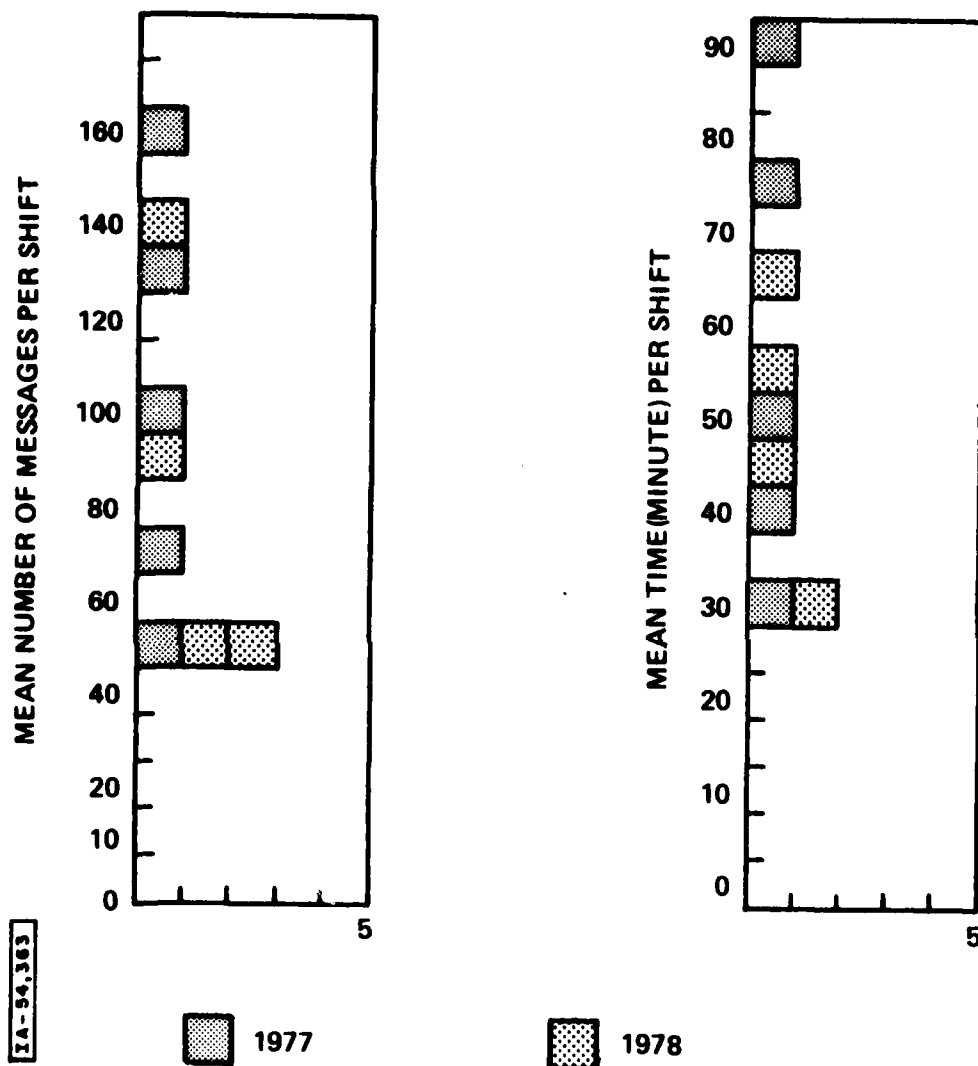


Figure 6. Incoming Message Review by JRC Watch Officers
(Checksheet Data)

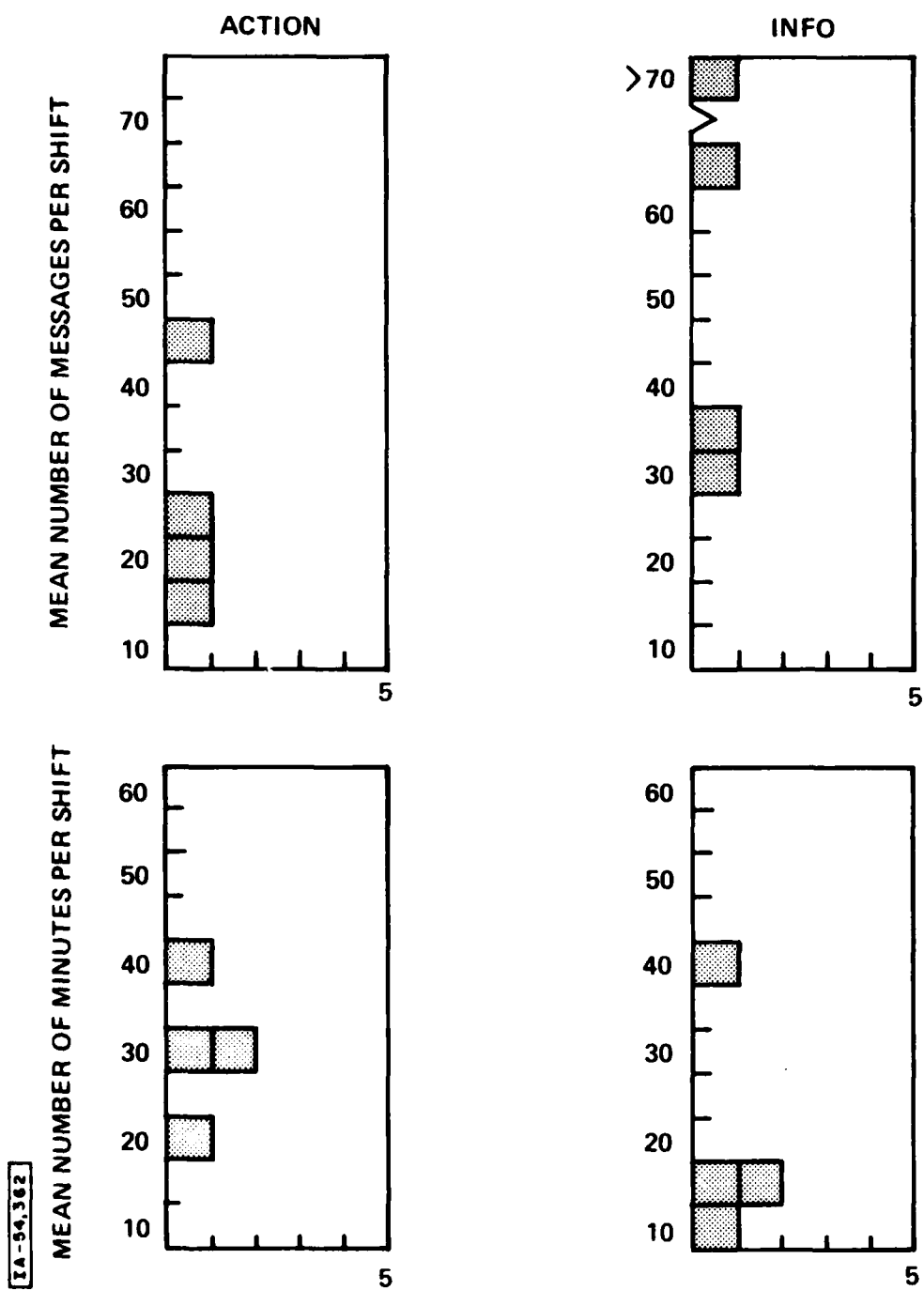


Figure 7. Incoming Action/Info Message Breakdown by JRC Watch Officers (1978 Checksheet Data)

direct access is limited to smaller numbers of files. The files of greatest interest to the officers are those they themselves maintain; these are the files containing information directly related to their current projects.

Files contain a mixture of materials including messages, nonmessage formal communications, informal notes, and documents and regulations. Figure 17 shows the proportion of each type of material in the respondents' files. Although the composition of the files varies, overall most of the materials in files are messages (52 percent), followed by documents/regulations (29 percent), and nonmessage, formal communications (17 percent). Informal communications occupy a relatively small proportion (5 percent) of the files.

Estimates of the numbers of messages to which they had direct access varied widely among the officers; answers ranged from 200 to 10,000. Officers consider themselves to have direct access to all the division and J301 files, as well as their own.

JRC WATCH OFFICERS

The JRC watch officers have an incoming message load similar to that of a heavily loaded branch. Filing activities, however, fall in between the levels reported for action officers and Command Center duty officers.

Although questionnaire responses varied, most of the JRC watch officers reported responsibility for about 13 files. Estimates for the amount of time spent on file maintenance ranged from 2 to 8 hours a week.

These officers estimated that they filed, or had filed for them, about 250 messages a week. The checksheet data for daily filing activity (figure 18) suggest that the estimates may be high, unless one considers all JRC activity per week rather than that of individual officers. On the

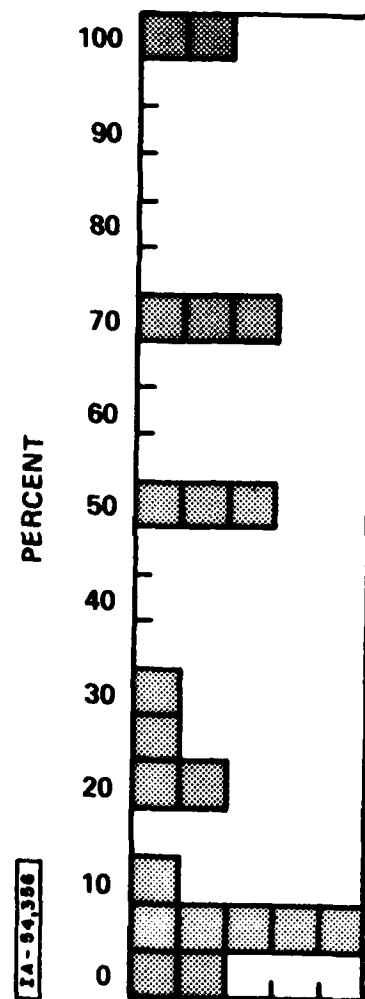


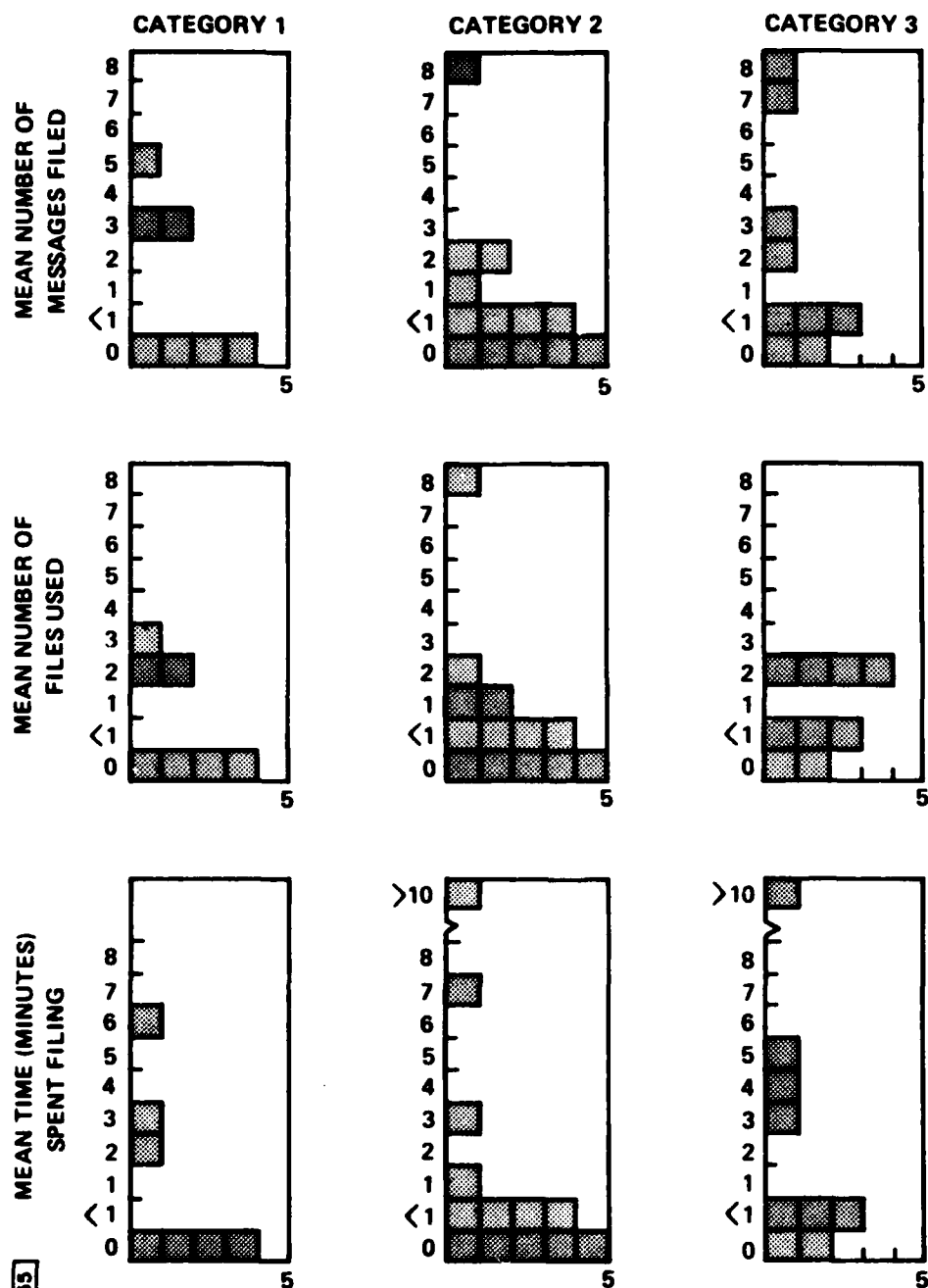
Figure 16. Percent of Messages Annotated Before Filing by Action Officers

Checksheet data confirm the above conclusion. In figure 14 action officers are grouped according to incoming message load (see figures 4 and 5). Filing activity was about the same for all groups. Almost all daily filing involved five or fewer files (and 10 or fewer messages) and took 5 minutes or less. About half the officers reported no filing at all; those who did report filing usually had several days on which no filing was done. (In figure 15 the means are calculated on the basis of all days for which data were reported, even if no filing was reported. These figures show an even lighter level of filing activity.) Although clerks do spend more time than this on filing, they did report that this task took less than one-half hour a day. File maintenance, then, is not a time-consuming activity for either officers or clerks.

Most of the officers report that they file, or have filed for them, between 15 and 50 messages a week. These reports are consistent with the checksheet and questionnaire data reported by clerks. Whether messages are annotated before filing depends very much on the individual. While some officers reported annotating 75 percent or more of their messages, others did no annotation at all (figure 16).

Action officers do not often request duplicate copies of messages for multiple filing. With two exceptions, the branch chiefs and officers reported requesting five or less duplicates a week.

Officers have access to files other than those they themselves maintain. These files include those kept by other branches and divisions for other projects and, of course, the Admin Section files. When asked how many other files they had access to, the majority replied 10, while others gave answers ranging from 20 to more than 800. The larger estimates reflect many officers' views that they have access to all files at CINCPAC. In fact,



*MEANS CALCULATED FOR ALL DAYS ON WHICH DATA WERE PROVIDED, REGARDLESS OF FILING REPORTS.

Figure 15. A Different Look at Daily Filing Activity by Action Officers (Checksheet Data*)

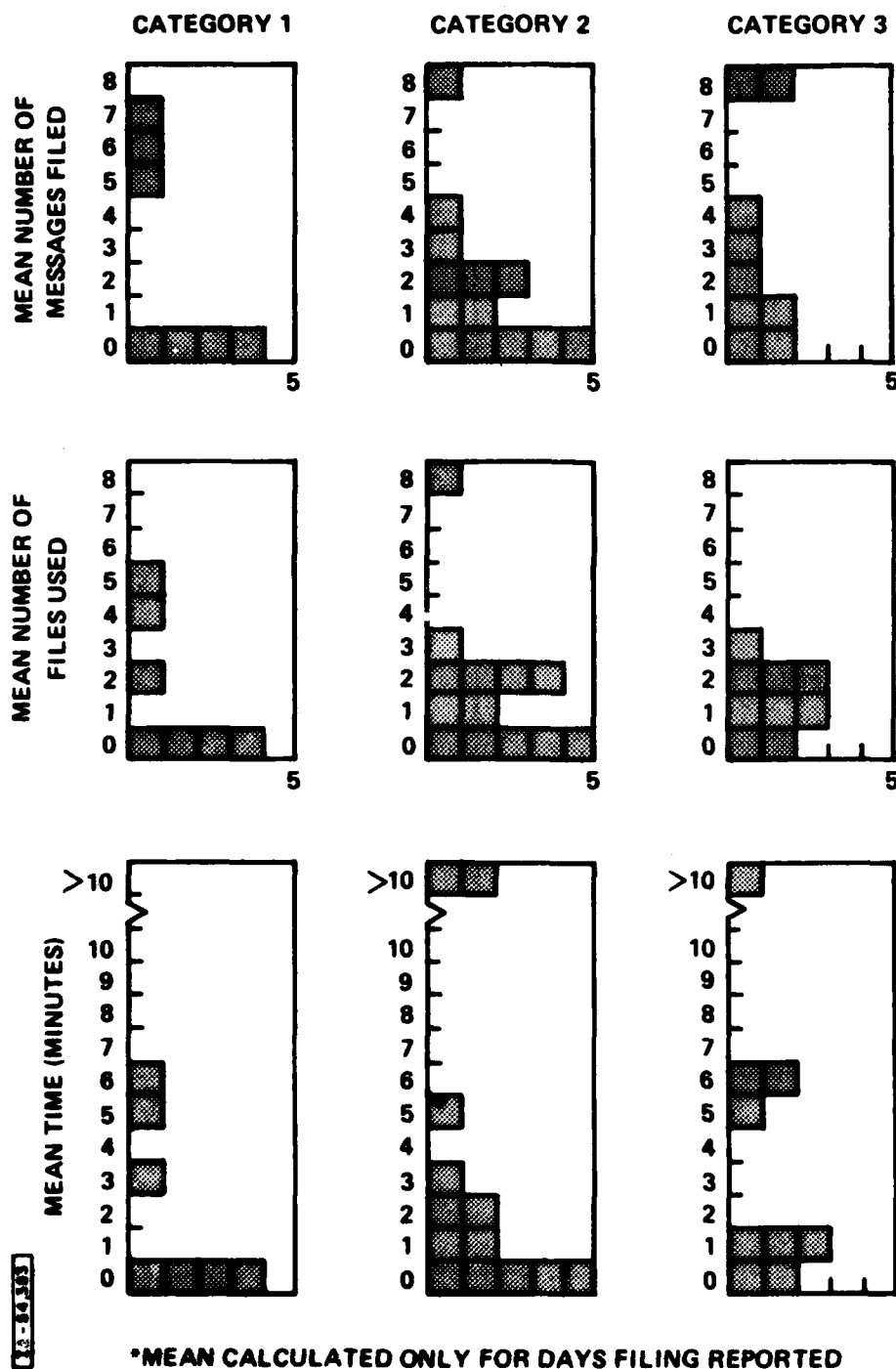


Figure 14. Daily Filing Activity by Action Officers (Checksheet Data*)

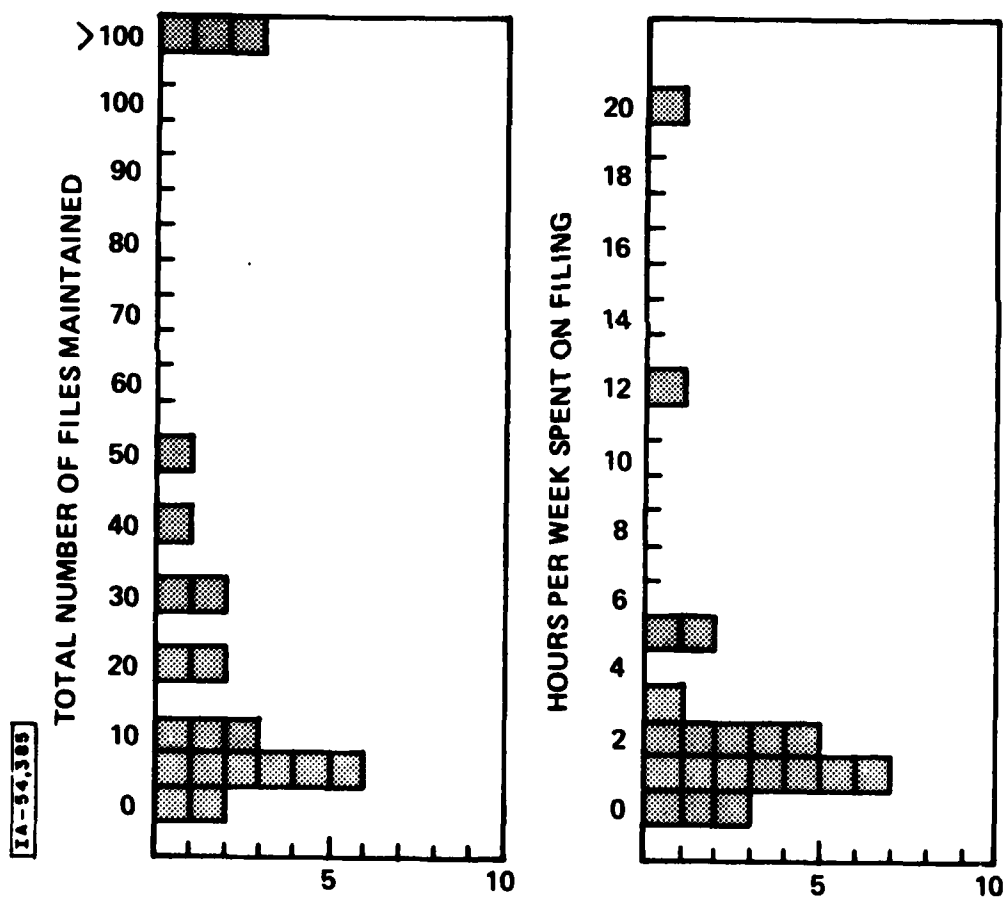


Figure 13. File Maintenance Activity by Action Officers
(Questionnaire Data)

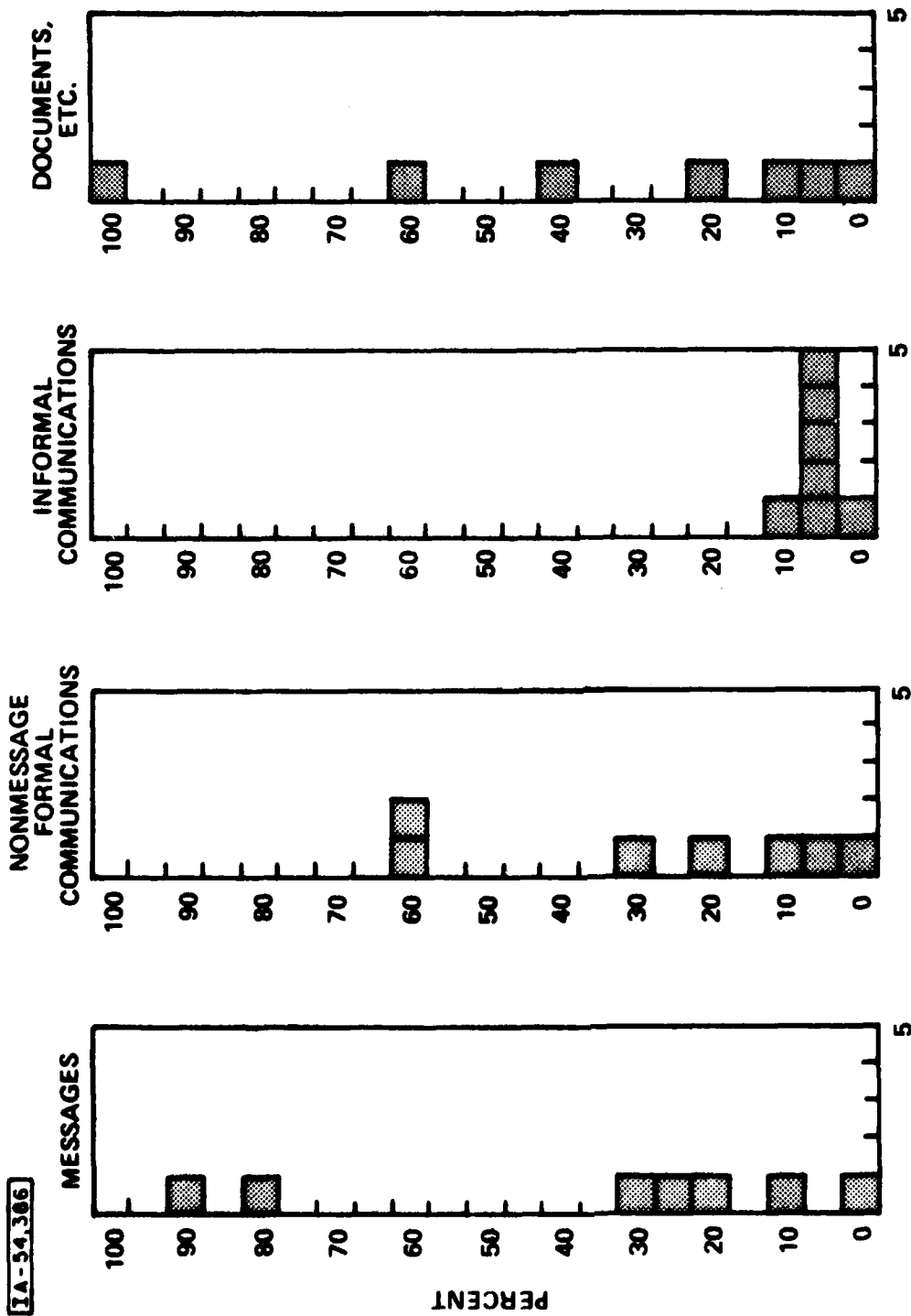
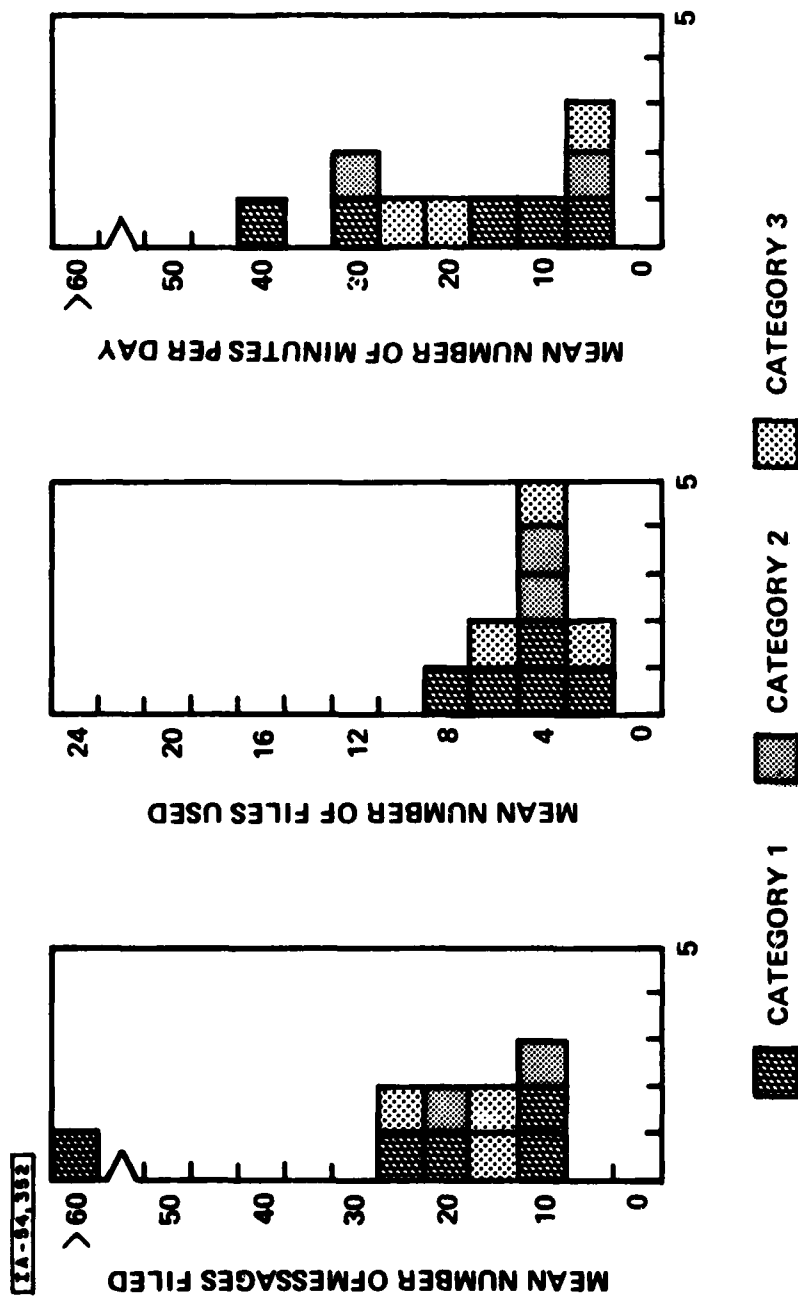


Figure 12. Composition of Files Used by Division and Branch Administrative and Clerical Personnel



*MEANS CALCULATED FOR ALL DAYS, REGARDLESS OF FILING ACTIVITY REPORTED

Figure 11. A Different Look at Daily Filing Activity by Clerical Personnel (Checksheets Data*)

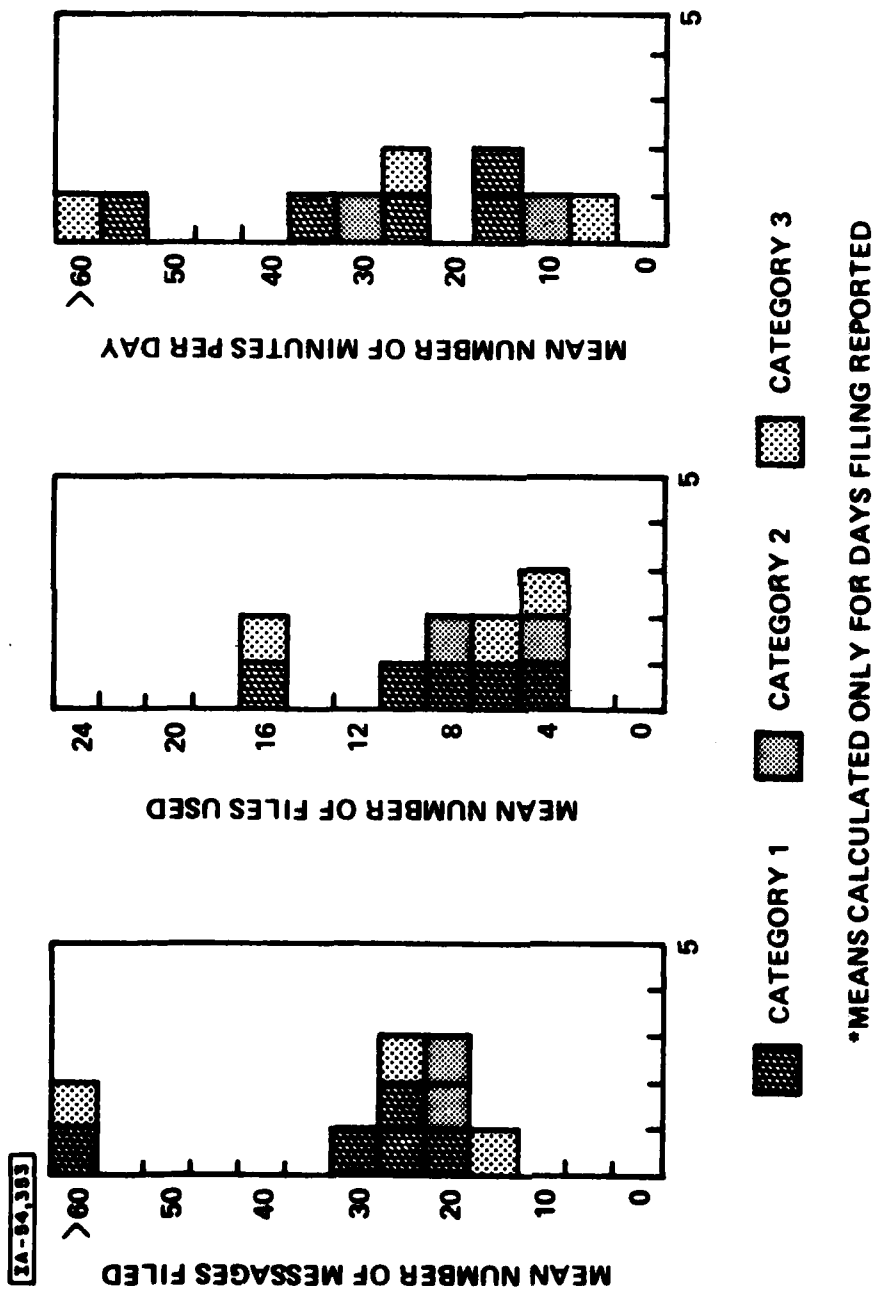


Figure 10. Daily Filing Activity by Clerical Personnel (Checksheet Data*)

copies of messages; one reported duplicating 25 messages a week. The rest of these clerks made 10 or fewer duplicates.

The files these personnel deal with generally consist of a mix of messages, other formal communications, informal communications, and documents, regulations, etc. A wide variety of file mixes were reported. The percentages assigned to each type are shown in figure 12. Overall, messages form the largest portions of the files, followed by documents and regulations, and formal nonmessage communications (roughly 44, 30, and 22 percent respectively); informal communications form a relatively small portion (4 percent) of the items filed.

ACTION OFFICERS

Action officers are the primary users of message information. They are responsible for selecting and organizing material kept in files, even though clerks may do the actual filing.

Messages are kept at an officer's desk from 1 to 5 days; then they are filed in the branch and project files, where they may be kept from 1 to 2 years. Messages of special interest, such as those to which an individual has been assigned action or comeback copies of messages he has drafted, may be kept on file for 1 or 2 years.

File maintenance activities reported in the questionnaire are shown in figure 13. Most of the respondents reported being responsible for 20 or fewer files. The amount of time spent during a week on file maintenance is fairly small; it is less than 2 hours a week for most of these officers. This suggests that even the officers who feel responsible for many files actually work with only a few on a daily basis.

administrative personnel are responsible for maintaining, and have access to, many more files in J3 than they actually use on an ordinary day. On their questionnaires a few of these personnel indicated they have responsibility for as many as 500 J3 files; most said they maintain 10 or fewer files that contain messages. Similarly, a few personnel said they have access to 500 files, while most claimed access to 10 or fewer. (In fact, given sufficient reasons and proper clearances, these personnel have access to most of the files within the directorate.)

The checksheet data in figure 10 show that clerks typically work with less than 10 files on days when filing is done. (Very little filing was reported by administrative personnel in divisions and branches.) Most clerks filed between 20 and 30 messages daily, although extremes as high as 80 were reported. Filing is not a time-consuming task; most filing is accomplished in less than 20 minutes a day, although it may take an hour or more on an especially heavy day. (If means are calculated on the basis of all days when data were reported (see figure 11), the load appears even lighter.)

Filing activity varies considerably from day to day. On some days no filing is done; on others there are many messages to be filed. The need for filing is influenced by incoming message loads and other message-related activities, which vary as a situation develops, is handled, and is finished.

It may be necessary or desirable to keep a message in more than one file. Of the couple of hundred messages that may be filed in a week, the branch administrative personnel make copies of 20 to 25 messages for multiple filing purposes. Five of the clerks also reported making multiple

SECTION 5

FILING

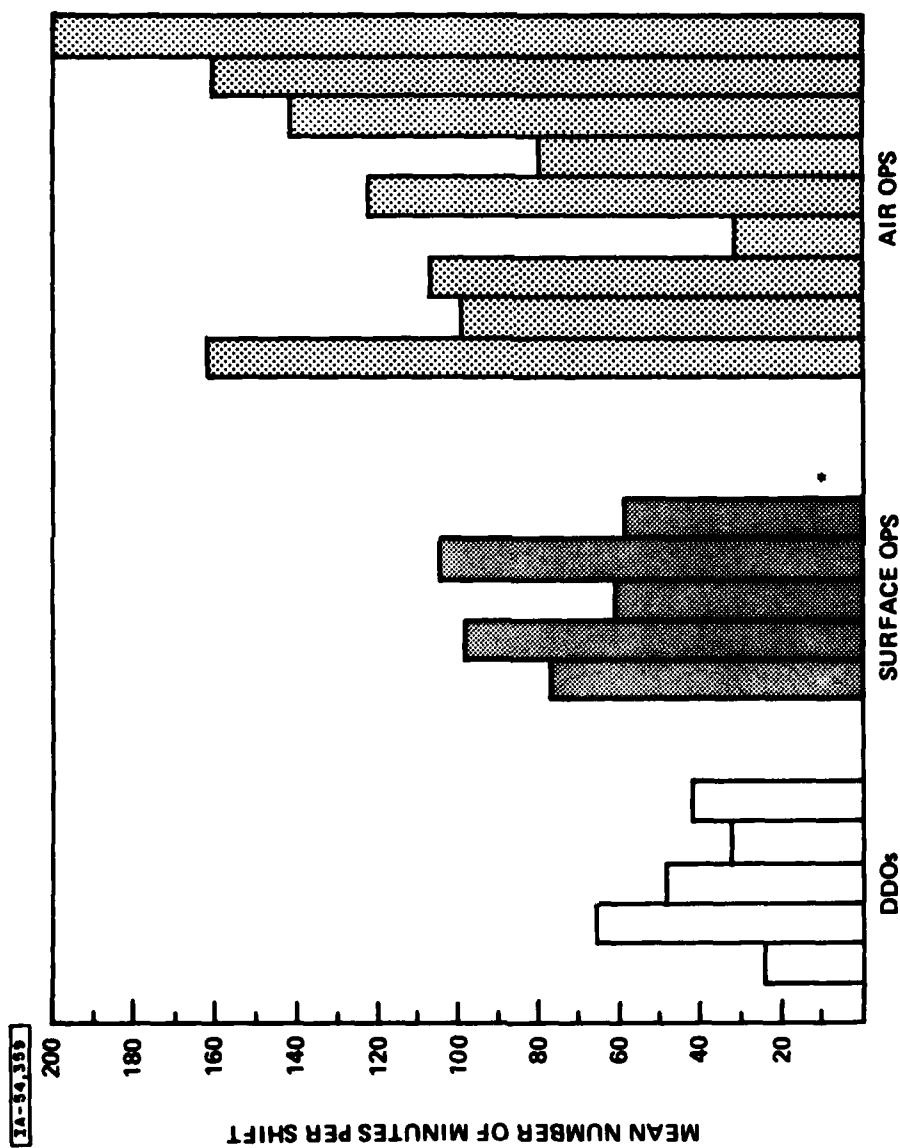
ADMINISTRATIVE SECTION (J301)

As was noted earlier, clerks in the Admin Section maintain Directorate files. During the day each message batch is sorted and filed by hour, according to each message's date-time-group of origin. There are typically around 30 messages in a batch, although the size may be as small as 15 or as large as 89. The filing process may take from 1 to 7 minutes, depending on whether any of the messages require special attention. On the average, however, this type of filing task takes only 2 minutes per batch or 8 minutes per day (see table 4). During the night shift, messages are further sorted by DTG minute and placed into folders for that day. No measures were taken of the time it takes to sort these messages (there are about 340 messages a day). The night shift is normally a quiet shift with no pressure on the clerk other than sorting the 0100 and 0500 batches and having the filing done before the day shift arrives.

The Admin Section maintains 62 file boxes (two for each day) for daily message traffic along with boxes for exercises and other special categories of messages. Each day's messages are kept for 30 days.

DIVISION AND BRANCH CLERICAL

In J3 files are maintained not at the division level but at the branch level. Administrative and clerical personnel provided filing data on the questionnaire and on checksheets. These data show that clerks and



*ONE DID NOT REPORT RETRIEVAL

Figure 9. Time Spent Retrieving Incoming Messages by CCWT (1977-1978 Checksheet Data)

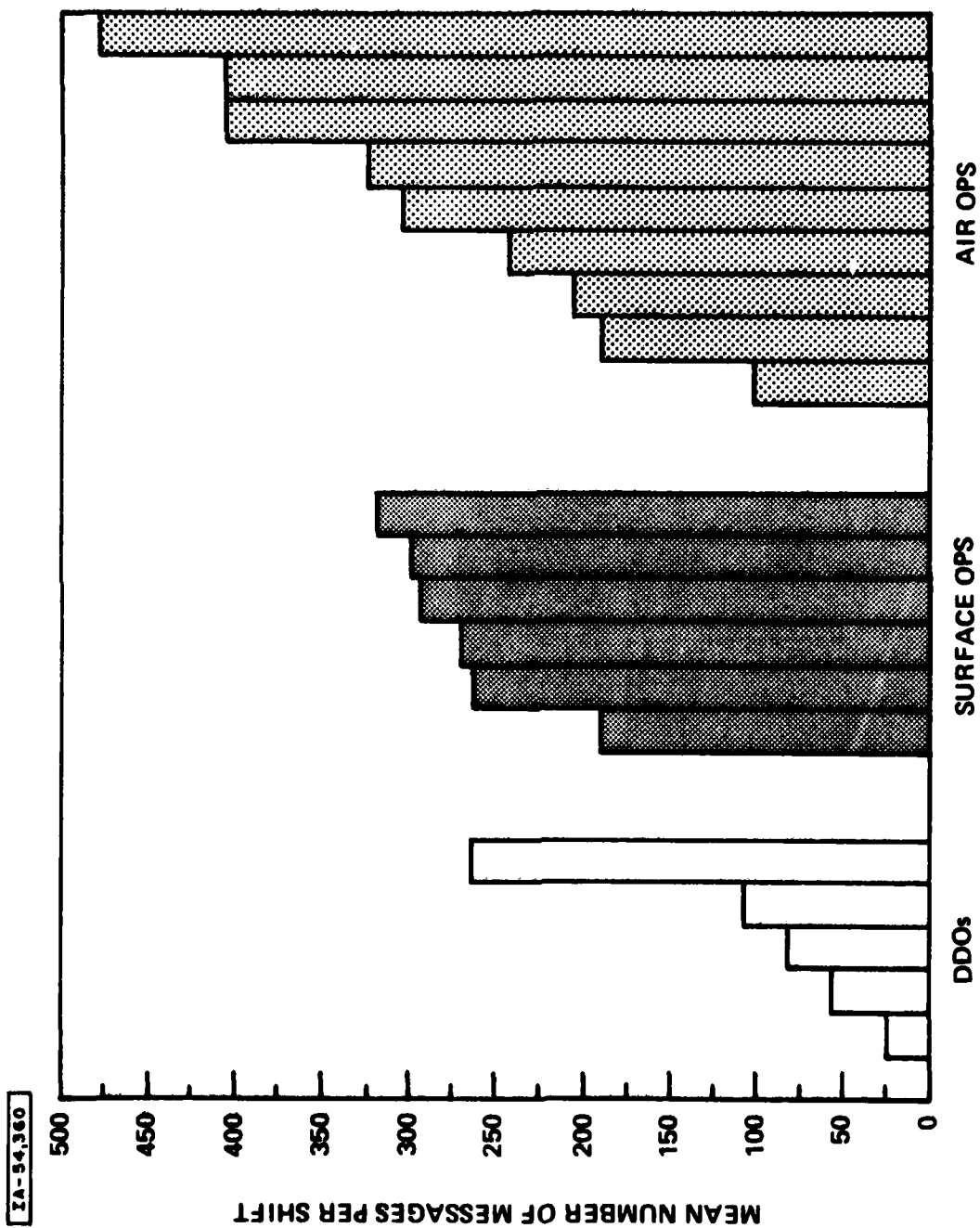


Figure 8. Incoming Message Review by CCWT Members (1977-78 Checksheet Data)

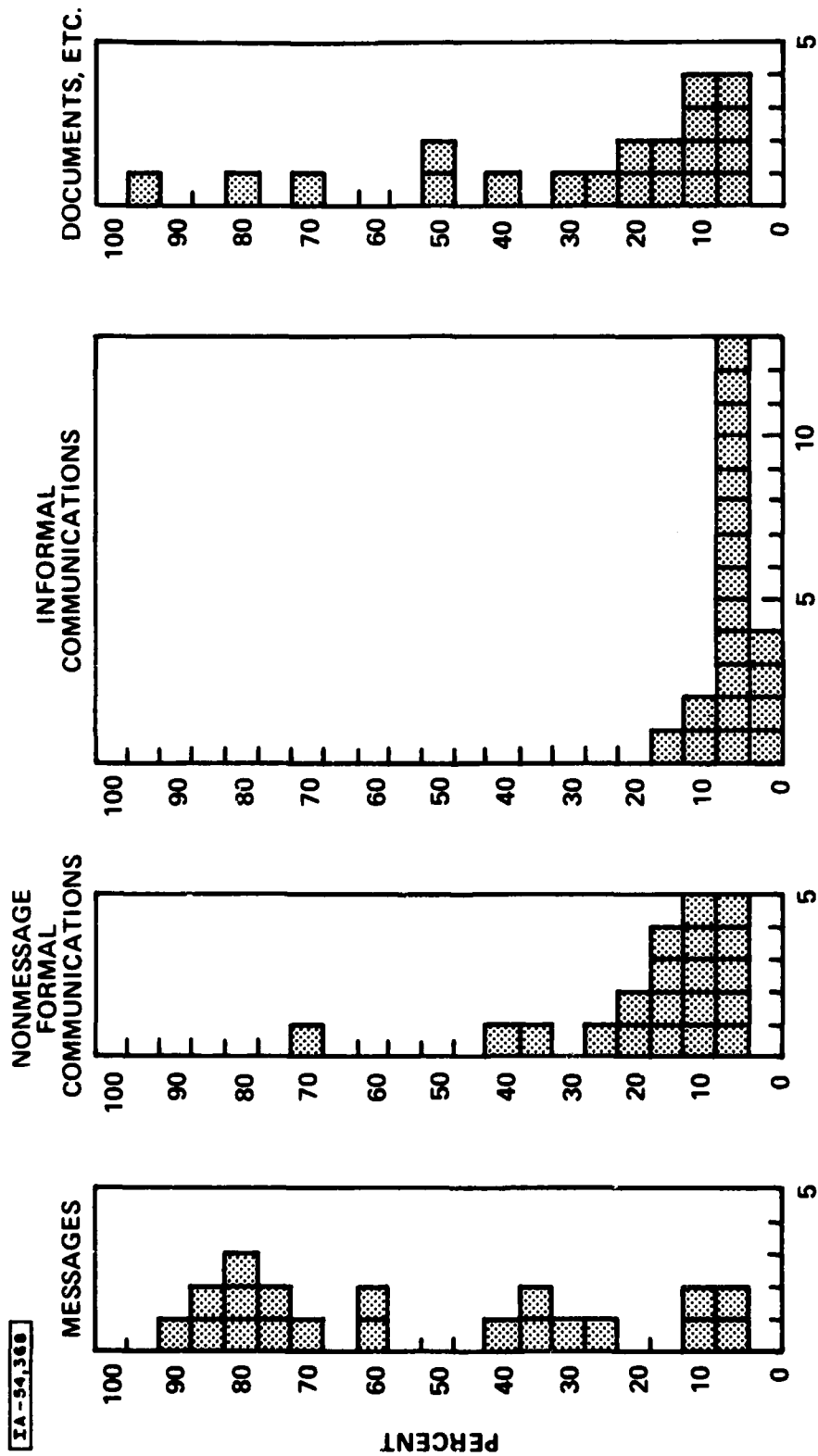


Figure 17. Composition of Files Used by Action Officers

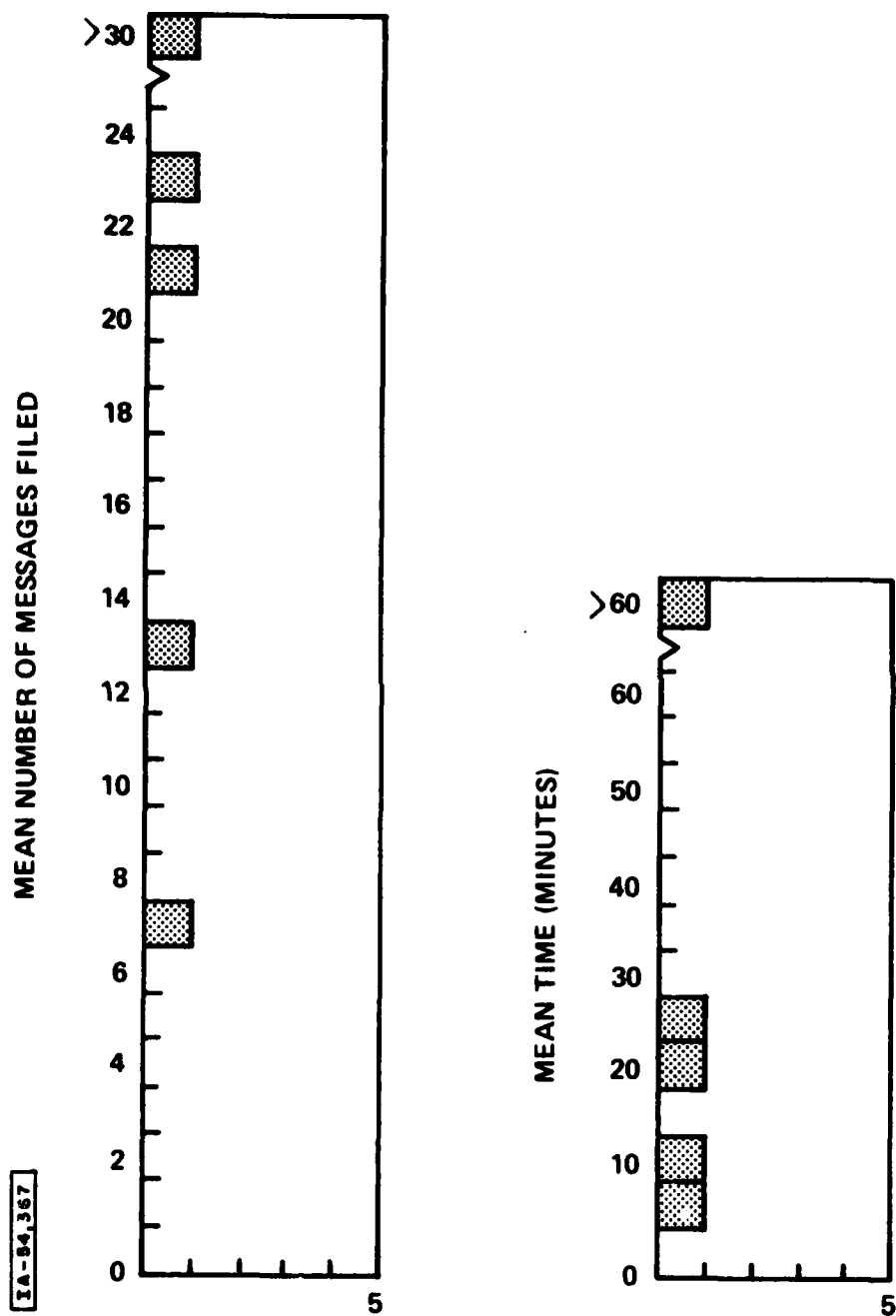


Figure 18. JRC Watch Officers Daily Filing Activity (Checksheet Data)

checksheets, most of the records showed 25 or fewer messages filed per shift; filing activity for the officers ranged from 10 to 60 minutes per shift.

In other respects JRC officers are similar to the action officers and the CCWT duty officers. Files are composed primarily of messages (about 64 percent), documents (17 percent), other formal communications (13 percent) and informal communications (6 percent).

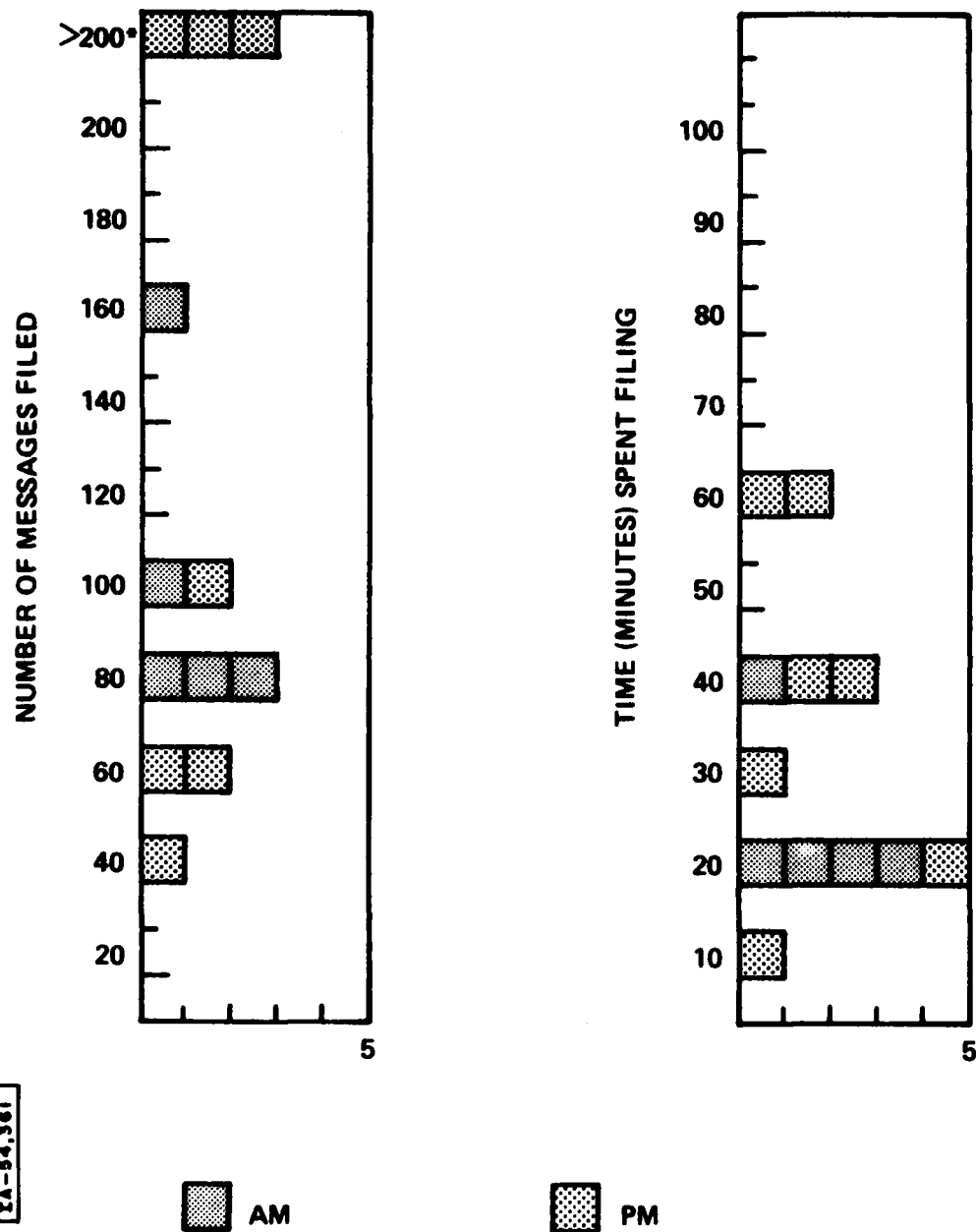
Annotation of messages is a matter of individual style with some officers annotating 1 to 5 percent of their messages and others annotating 75 to 90 percent.

COMMAND CENTER CLERKS

The CCWT clerks are more involved in monitoring the Command Center printer, and checking and distributing messages, than in filing and file maintenance.

On the questionnaire, each clerk reported being responsible for maintaining only two files. One of the clerks reported spending 7 hours a week on file maintenance, while the other three each reported taking only 1 hour a week for these tasks.

The times reported on the checksheets are about the same as those on the questionnaires. On days when checksheets were used, CCWT clerks said they filed between 34 and 421 messages a shift, and spent between 5 and 60 minutes on the filing. The frequency of their responses is shown in figure 19. (Several clerks did not report the number of files. The highest number reported was two; however, it is not possible to draw any useful conclusions from these data.)



*421, 415, 310 MESSAGES FILED ON EVENINGS FOLLOWING AN EXERCISE.

Figure 19. Daily File Maintenance Activity by CCWT Clerks
(Checksheet Data)

The amount of time spent on file maintenance depends in part upon the shift. The AM (6 a.m. to 6 p.m.) shift average is 20 minutes, while the PM (6 p.m. to 6 a.m.) shift average is 35 minutes. The volume of messages also varies with an average of 71 messages for the AM, and 200 for the PM shift. The highest levels of filing activity on the PM shift followed a weekend exercise; it is possible the volume of messages filed resulted from the exercise.

On the questionnaire, the clerks reported filing from 50 to 800 messages a week (3-day shift). The checksheet data above suggest that the average may in fact be somewhat higher.

Whether messages are annotated depends on the individual. Some clerks report that they do not annotate the messages they file, while one clerk reported annotating all the messages he files. The clerk's notations are generally limited to the date a message was given to him for filing and the name of the officer who gave him the message.

COMMAND CENTER DUTY OFFICERS

Duty officers also work with and maintain files. The number of files maintained by a duty officer depends on the desk occupied. At the Surface Ops desk, over 100 files are reported. While several of these "files" are in fact documents, such as the Camp Smith telephone directory, most are project or position (desk) oriented. At the Air Ops desk there are 50 files, some with reference or administrative materials, the rest project oriented. A similar mixture is found at the DDO's desk, although he uses only 10 files.

The percentage of the different types of materials kept in the Command Center files is shown in figure 20. Again, there are fairly high proportions of messages (68 percent) with smaller percentages of documents and

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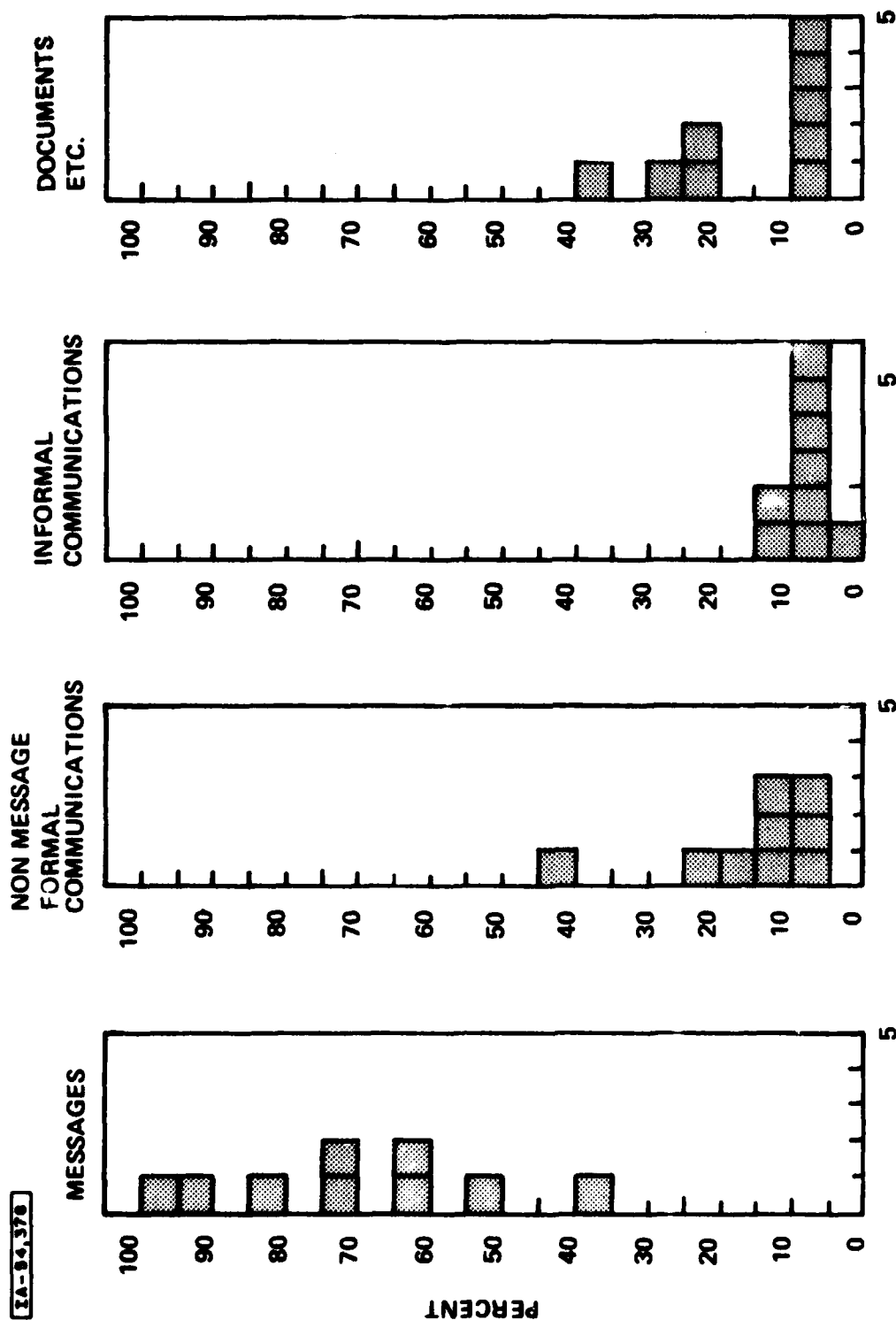


Figure 20. Composition of Command Center Files

regulations (14 percent), and other formal and informal communications (13 percent). Notes and other informal communications make up a small portion (5 percent) of the files.

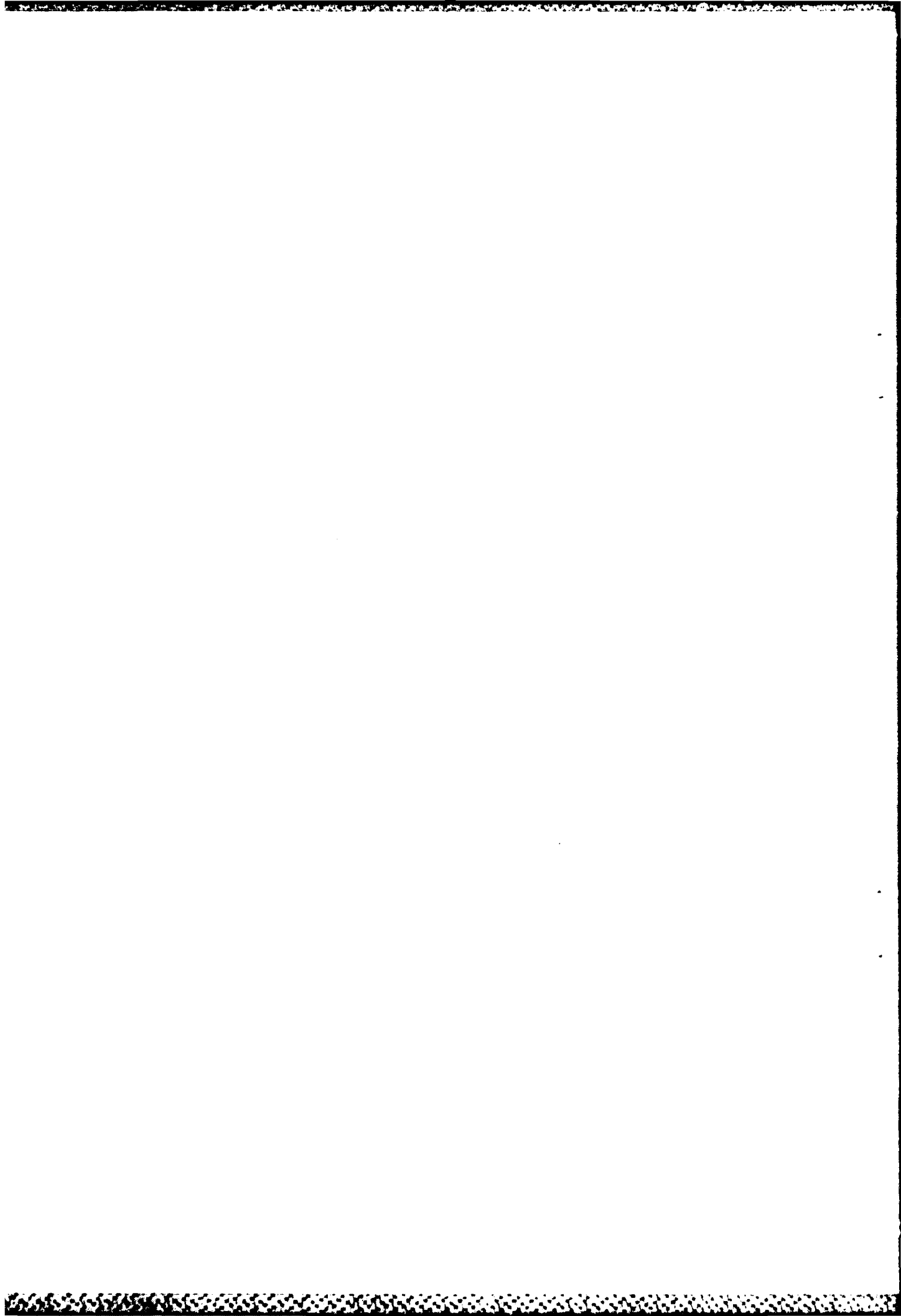
In general, file maintenance does not occupy a great deal of the duty officer's time. One officer did report spending as much as 10 hours a week on his files; however, most of the duty officers reported that 2 hours or less is spent on these tasks.

Messages are kept in the active work area from 1 to 10 days with most officers reporting they keep the messages 5 days or less. Messages are kept in the Command Center files from 5 to 90 days.

Hundreds of messages are filed a week. Although several duty officers reported filing (or having filed for them) only 25 to 50 messages a week, other estimates were as high as 400. These estimates are in line with the numbers reported by the clerks.

Relatively small percentages of the messages filed are annotated by the duty officers. The majority of the officers reported annotating 10 percent or fewer of their filed messages.

There is a greater tendency to make duplicate copies of messages in the Command Center than at other branches. Although the most frequent response to this question was five duplicates per week, half of the duty officers said they request duplicates of messages from 10 to 50 times during an average week. This need for duplicate copies of messages reflects the distribution functions of the CCWT personnel; although they give the message to the action officer, they may also want a copy for their own files.



SECTION 6

MESSAGE RETRIEVAL

ADMINISTRATIVE SECTION

Each day the Admin Section (J301) receives a few requests for messages received over the past days or weeks. (Messages are kept on file in the message vault for 30 days.) Although one clerk reported receiving 10 such requests a day, the others estimated receiving between three and five requests daily. The requested messages may be anywhere from 2 to over 15 days old. Admin clerks report that they can find 90 percent of the requested messages in their files. If the message cannot be found, a request is sent to the Communications Center. (Messages are kept there on microfilm for several years.) Although the clerks' estimated numbers of Communications Center requests ranged from two to 30, three of the five clerks reported making six or fewer such requests a week. These responses indicate that most of the requests received by J301 are for messages less than 30 days old.

The Communications Center is usually able to satisfy requests from J031. Although two clerks said they failed to receive the requested message 20 to 30 percent of the time, the other clerks reported that only 10 percent of their requests were not satisfied. The Communications Center provides messages fairly quickly; the requested message is usually available within 1 hour of the request's receipt.

Messages are filed by date and time in J301 files. The DTG is thus the primary retrieval mechanism. Without DTG, or an approximate DTG, the message can be found only with great difficulty. It takes Admin Section

clerks only 1 minute to find a message if the DTG is known. If the DTG is not known, it could take from 5 minutes to 2 hours. When the DTG is known, the age of the message is irrelevant; it takes no longer to find a message that is 30 days old than one that is 2 days old.

DIVISION AND BRANCH ADMINISTRATIVE AND CLERICAL

At the branch level, administrative and clerical personnel are generally involved in message retrieval if the action officers cannot find a message or need a copy from the Admin Section or the Communications Center.

According to checksheet data, administrative and clerical personnel often do no retrieval; requests to find messages in branch or project files happen only once or twice a day, if at all. Administrative personnel tend to receive more requests than clerks and thus to spend more time on retrieval. (Of the nine administrative and clerical personnel who filled out checksheets in 1978, only three reported message retrieval activity. They retrieved only one or two messages a day; most of these messages were less than a week old.)

When searching for a message in the branch files, the proper file must be found first. Files are arranged by project or topic, so the topic of the message is of first importance for finding the proper file; the DTG and message originator are respectively second and third in importance.

Once the file has been found, the retriever looks for the message by DTG. The originator and topic are the second and third pieces of information used to find the message.

When the message DTG is known, the message can usually be found in 5 to 10 minutes. If the topic is known, it may take 10 to 15 minutes;

if the originator is known, it may take 10 to 30 minutes. Administrative and clerical personnel indicated that the DTG is vital and that without it they may not be able to find the message at all.

The age of the message has no strong bearing on retrieval time. Messages can usually be found in less than 10 minutes, regardless of age, if the DTG is known.

Branch administrative personnel and clerks also relay requests for messages in the Admin Section files. This happens infrequently; clerks reported averaging between one and five such requests a week. The ages of the requested messages vary from 2 to 30 days. The Admin Section satisfies 70 to 100 percent of these requests.

The remainder of the requests, perhaps two or fewer a week, are handled by the Communications Center. The Communications Center fills over 90 percent of these requests successfully; clerks usually receive the message within an hour of their request.

The small amount of message retrieval may be attributed to the officers' work habits. Messages of current interest are usually kept at an officer's desk, so retrieval by a clerk is unnecessary.

ACTION OFFICERS

The most common reason for an action officer to retrieve a message is that he needs it as a reference in a message he is creating. The majority of the action officers report that 75 to 100 percent of the message requests they send to the Admin Section are for references in a message they are using. Although it may take as long as 4 hours to receive the message, it is usually delivered within an hour. About 75 to 100 percent of the references needed can be found in the officers' own files.

When looking for a message, action officers use the same items of information as clerks. First, they find the appropriate file, most often by using the message topic. The originator and DTG are rated second and third as helpful pieces of information for finding the file. After the file has been found, the search is equally likely to continue on the basis of DTG or originator. The topic ranks third as a search criterion.

When the officer knows the DTG, he can usually find the message in less than 5 minutes, and most report they can find the message in under 1 minute. It takes about the same time if the topic is known. However, if the only item of information known about the message is the originator, it may take 15 to 60 minutes, or even longer.

For some officers, the message can be found somewhat more quickly if the message is only 2 days old (most answers were 5 minutes or less) than if it is older. If the message is 7 days or less, these officers may take 10 to 30 minutes to find it. If the message is more than 7 days old, it may take 15 to 60 minutes to find the message. The other half of the group of officers report they can find a message in 5 minutes or less, regardless of the message age.

Determining the amount of time spent on message retrieval during a day or week is difficult. Messages arrive on an officer's desk, are read, and may be kept at the desk or filed. Messages of current interest may be kept at the desk from 5 to 10 days and thus do not need to be "retrieved."

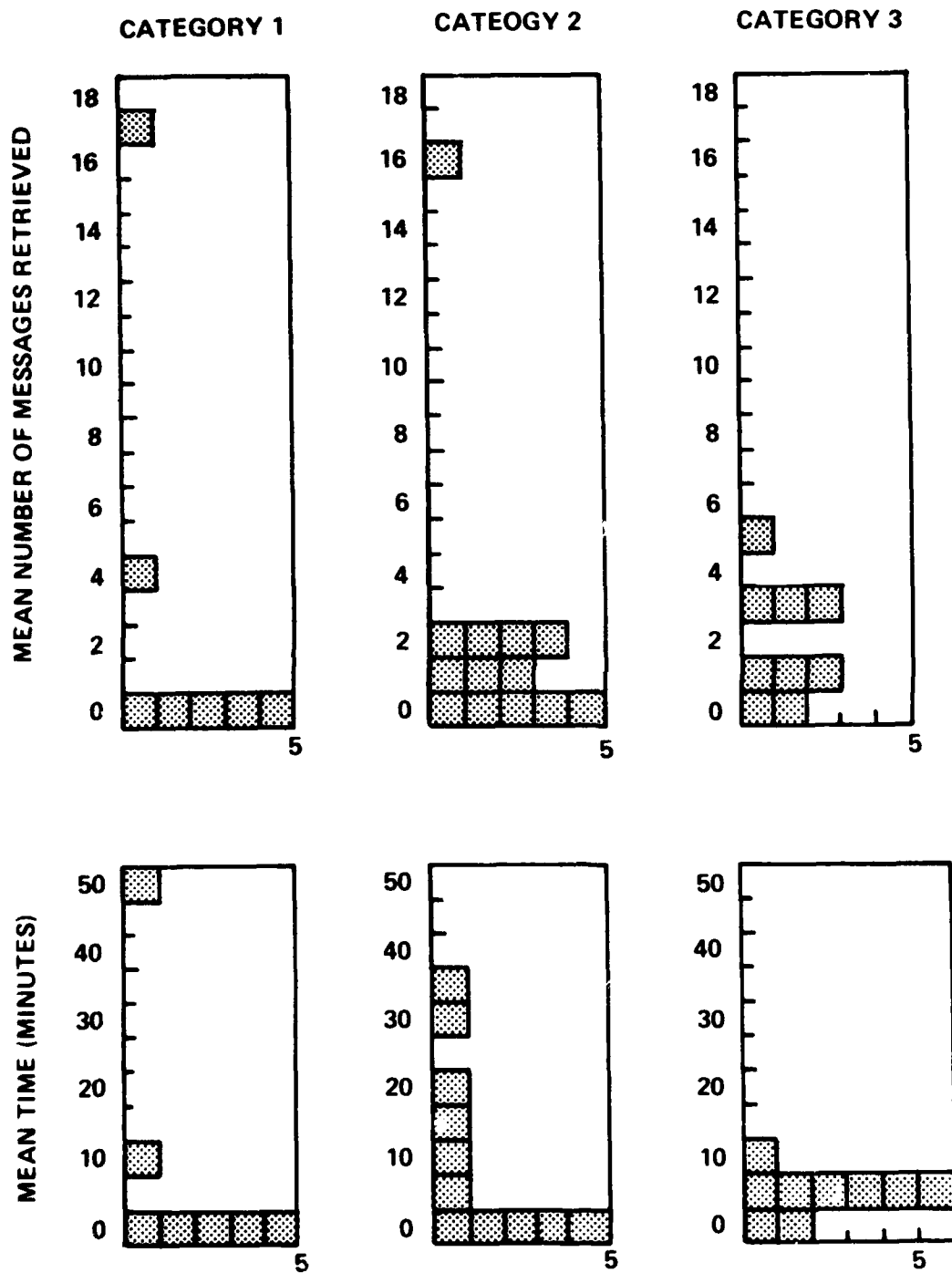
About half the officers who provided checksheet data reported some message retrieval activity. For most of these officers, message retrieval was a minor activity. In figure 21 the officers have been arranged according to their categorization by message usage (figures 4 and 5). Category 2, the group that receives few action but many info messages, shows the

greatest amount of retrieval activity. This group is concerned less with daily operations and more with planning, which would account for the pattern of message usage. They presumably use their info messages for planning and long-range decision-making. The group in category 3 shows the next most active retrieval; officers in category 1 have light retrieval activity. Note, however, that even in the most active retrieval group 15 minutes or less are spent on retrieval, and most often five or fewer messages are retrieved each day. (In figure 22 retrieval is calculated according to all days on which data were reported, regardless of whether any messages were retrieved; thus, it shows an even lighter load.)

JRC WATCH OFFICERS

The JRC watch officers do not often need to retrieve messages from files. Messages of interest are generally kept in the immediate work area for 30 days, so do not need to be retrieved. These officers estimated that they ask a clerk to get a message for them about four times a week. The message is usually delivered to them within an hour. This fast response (compared to that for the action officers) may be due to the JRC location within the Command Center, where messages can be delivered directly by pneumatic tube from the Communication Center.

When they do need to retrieve messages from files, the JRC watch officers use the same techniques as action officers. The file is found using the message topic as primary criterion. The message is found using the DTG as primary criterion. The message is found most quickly (5 to 15 minutes) when the DTG or subject is known. It takes longer to find the message if it is necessary to search by originator only (5 to 30 minutes). Messages less than 2 days old are found most quickly (2 to 5 minutes).



*MEANS CALCULATED ONLY FOR DAYS RETRIEVAL REPORTED.

Figure 21. Daily Message Retrieval by Action Officers (Checksheet Data*)

AD-A157 695

MILITARY MESSAGE EXPERIMENT BASELINE DATA REPORT TEST
GROUP(U) MITRE CORP BEDFORD MA N C GOODWIN 19 SEP 78
MTR-3665 F19628-79-C-0001

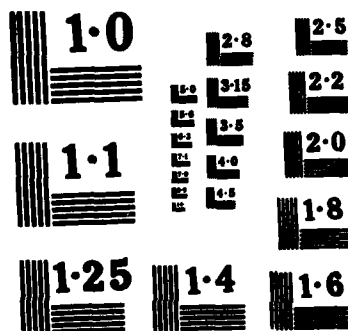
2/2

UNCLASSIFIED

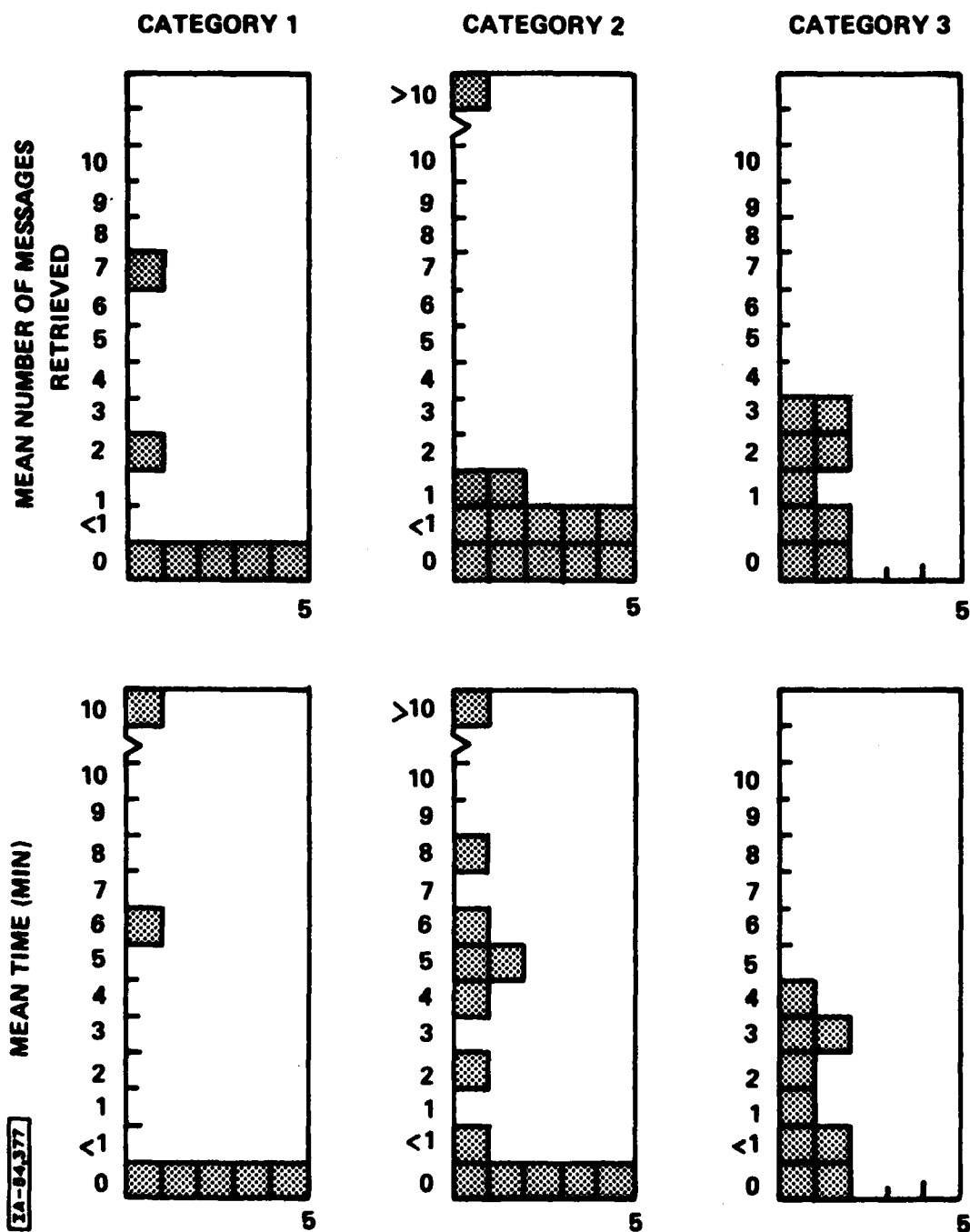
F/G 5/1

NL

END
FILED
DTIC



NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART



*MEANS CALCULATED FOR ALL DAYS CHECKSHEET DATA REPORTED, REGARDLESS OF RETRIEVAL ACTIVITY.

Figure 22. A Different Look at Message Retrieval by Action Officers (Checksheet Data*)

Messages between 3 days and 2 weeks old may take 15 minutes to find; messages older than this may take one-half hour.

Very little retrieval activity was reported on the checksheets. This may be due to the practice of keeping current messages in the work area and the primary involvement of the JRC in current events rather than long-range planning.

COMMAND CENTER CLERKS

Command Center clerks are seldom involved in message retrieval; they may be asked to get a message from the Admin Section, but this happens only once or twice a week and takes only a few minutes of their time. When they do have to search a file for a message, they use the same techniques as the other personnel reported.

COMMAND CENTER DUTY OFFICERS

The Command Center duty officers monitor messages, looking for ones of special importance or which pertain to a particular situation of interest. Relevant messages are kept in files until the situation has been resolved.

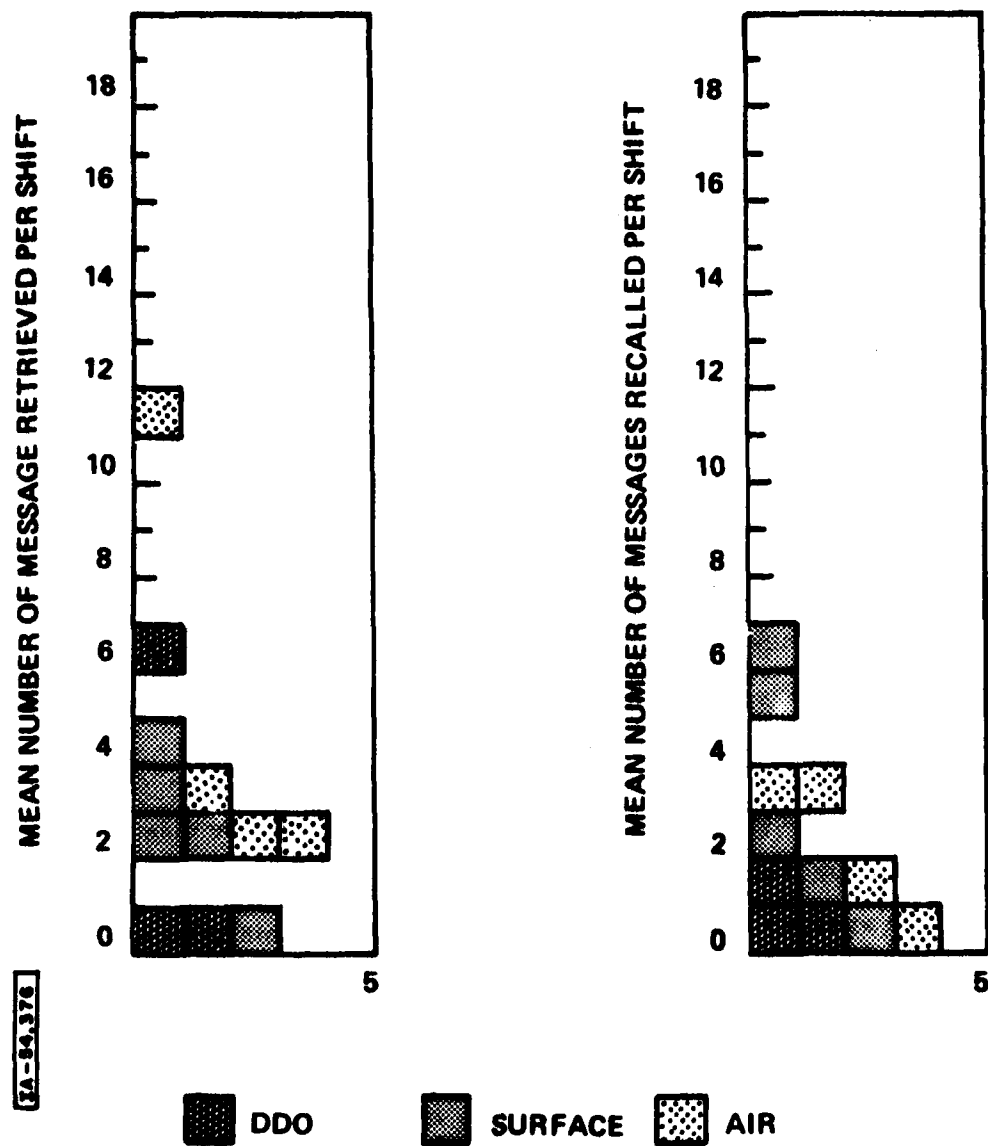
When they need to find a message in a file, the duty officers first find the file, using message topic to guide them. The originator and DTG are the second and third likely items of information to be used to find the file. To find the message in the file, duty officers search by DTG. The originator and topic are the second and third criteria used.

When either DTG or topic are known, most duty officers can find the message in 5 minutes or less. If they only know the originator, it may take 10 minutes. When all three items are known, the message can be found in 1 minute.

Message age also affects retrieval time. Messages less than 2 days old can be found in 10 minutes or less; half of the duty officers reported they could find the message in 3 minutes or less. If the message is between 2 and 14 days old, the time needed may increase to 30 minutes, whereas a message older than that may take an hour to find. The effect of message age on retrieval time may be more noticeable for the Command Center than other offices because these duty officers are dealing with current, developing situations. If an older message is needed, the file may have been moved away from the officer's desk area to a file cabinet or storage area.

During the 1978 checksheet data collection period, duty officers reported on message retrieval from their files (figure 23). The Air Ops duty officers reported the most retrieval; while this may be the effect of a current situation, the message recall data from two different periods (discussed below) and the message review data in figures 8 and 9 suggest that the Air Ops duty officer is the most involved of the CCWT in message-related activities.

If they cannot find a message in their own files, the duty officers will request a copy from the Admin Section or from the Communications Center. During an average week, these officers may make from three to 30 requests to Admin; however, most frequently the officers report making five or fewer requests. The requests are usually satisfied within 2 hours. Messages are most often requested because they are references mentioned in another message. Half the officers said that 75 to 100 percent of their requests were for references.



*MEANS CALCULATED ONLY FOR DAYS ON WHICH RETRIEVAL AND RECALL REPORTED.

Figure 23. CCWT Message Retrieval and Recall Activity (Checksheet Data*)

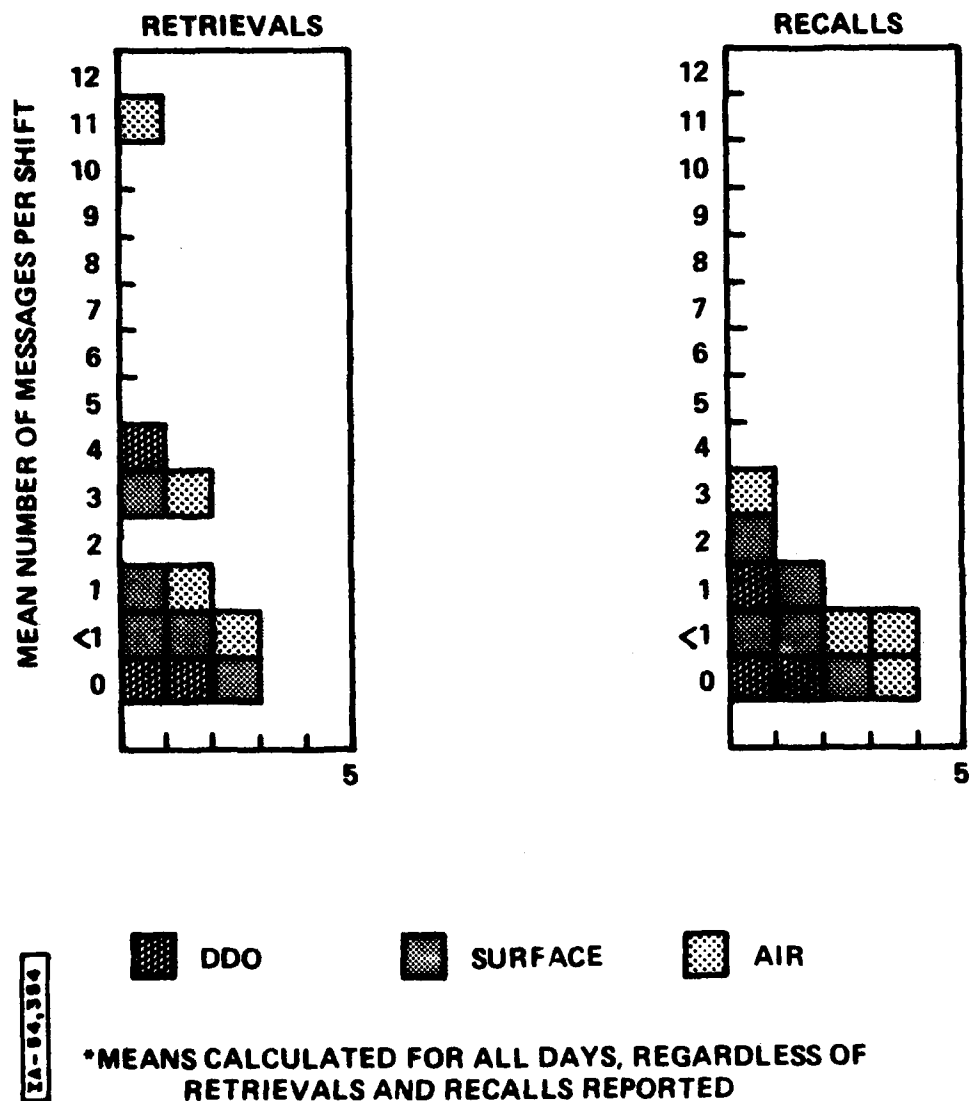


Figure 24. A Different Look at CCWT Retrieval and Recall Activity (Checksheet Data*)

When a message is needed quickly, personnel in the Command Center can request a copy (or "recall" the message) directly from the Communications Center. (The message DTG must be provided for fast retrieval from the Communications Center.) During the periods that checksheets were being filled out, the number of recalls reported varied with the desk (figure 23). The DDO recalled messages on five of the 22 shifts reported. On four shifts, only one message was recalled, while on the fifth, two messages were recalled. Only a few minutes were spent on this task.

At the Surface Ops Desk, message activities were reported for all shifts; recalls were reported for only eight shifts. The number of messages recalled ranged from one to six; the time spent ranged from 2 to 20 minutes.

At the Air Ops Desk, messages were recalled on 15 of the 43 shifts reported. The number of messages recalled varied from three to 34 a shift with most of the requests for six or fewer messages. The time spent recalling messages ranged from 5 to 35 minutes.

(In figure 24, retrieval and recall are shown with means calculated on the basis of all days for which checksheet data were provided. This figure shows an even lighter overall retrieval load.)

The CCWT duty officers' message-related activities primarily involve current messages (see section 4, Message Usage). Older messages are retrieved from files on about half the shifts, more often by the Air Desk officers than the others. Computer aids designed to help an officer sort through recent messages, and aids for organizing and filing messages, would also be of help for message retrieval.

SECTION 7

CREATION AND DRAFTING

ACTION OFFICERS

Messages are formal, record communications. Messages may be drafted in response to other messages, in response to nonmessage communications, or to initiate an action or project. They must be coordinated with other members of J3 and CINCPAC, so that those who may be affected by the message, or those who are knowledgeable about the topic it covers, have a chance to approve or revise the message content. Other types of communications, such as letters or memos, may also be used.

Although the questionnaire included questions about time and effort spent on creation tasks, the most valuable data about these tasks were obtained from the 1978 checksheets. At that time, among the 29 action officers who provided useful data, 22 reported spending some time on the drafting of messages, letters, memos, and other written documents. The data in figure 25 show the mean number of various types of written materials prepared daily; note, however, that these means were calculated for 92 days that materials were drafted. These numbers would be lower when workload is considered over the 147 days for which data were reported (see the discussion in section 2, Presentation of Data).

The data in figure 25 suggest that the officers in category 1 - heavy action and moderate info message loads - create somewhat fewer messages, letters, etc., than other officers in the other categories.

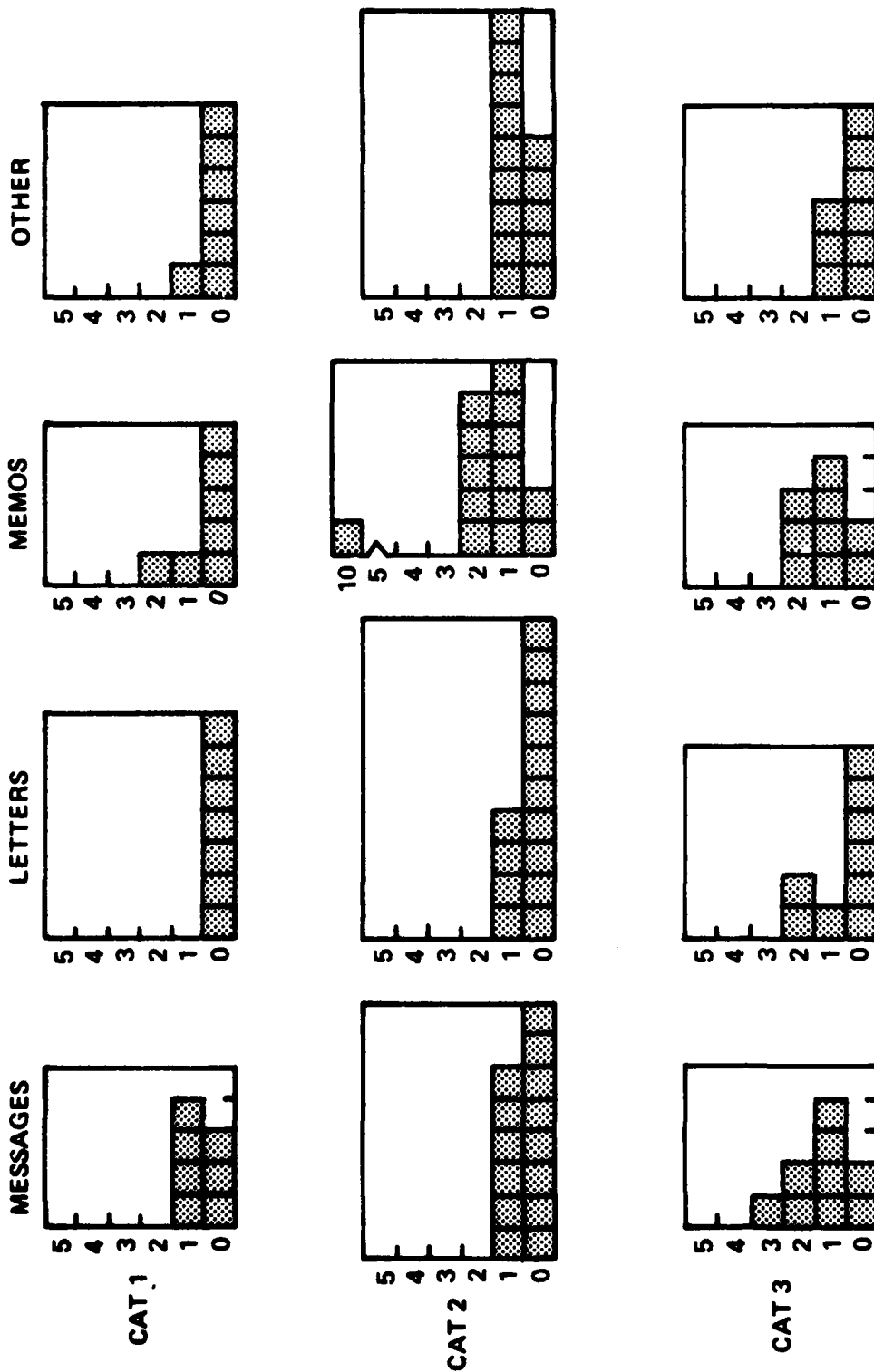


Figure 25. Mean Number of Communications (Outgoing) on Days Any Written, Action Officers (Checksheet Data)

These data also suggest that the officers in category 3, light incoming message load, create the most outgoing materials. When these data are considered in connection with data provided by the clerks, one suspects that there is no real difference among categories, but that it is an artifact of the data collection procedures. (Clerks in category 1 reported typing as many messages, etc., as clerks in other categories.) Not all members of the branches in category 1 returned checksheet data, which may account for the discrepancies in reports from action officers and clerks. In discussing the differences among categories, all one can say is that the officers in category 1 who did provide data reported less creation activity than officers in the other categories. It should be noted that within categories clerical and action officer data for incoming messages were consistent.)

For creation tasks, the number of items created and time spent on them is of more interest than possible differences among action officers.

Even among the most active drafters of messages, letters, memos, and other materials, the average number of items drafted was three or less per day. (One officer reported writing 15 memos one day and five another. All others reported writing three or less each day that drafting activity took place.) Looking at the proportions of different types of materials drafted (figures 26, 27, and 28), one sees that letters and memos are a significant portion of the writing task load. Thus, automated aids that support these materials as well as messages would be useful.

For most officers, when creation tasks occur, they take less than 90 minutes a day. Although extreme values, such as 225 minutes are shown in figure 29, the lower values are more common. The time is divided among several phases of message, letter, memo, and other document creation. Figure 30 shows the mean times reported for gathering information,

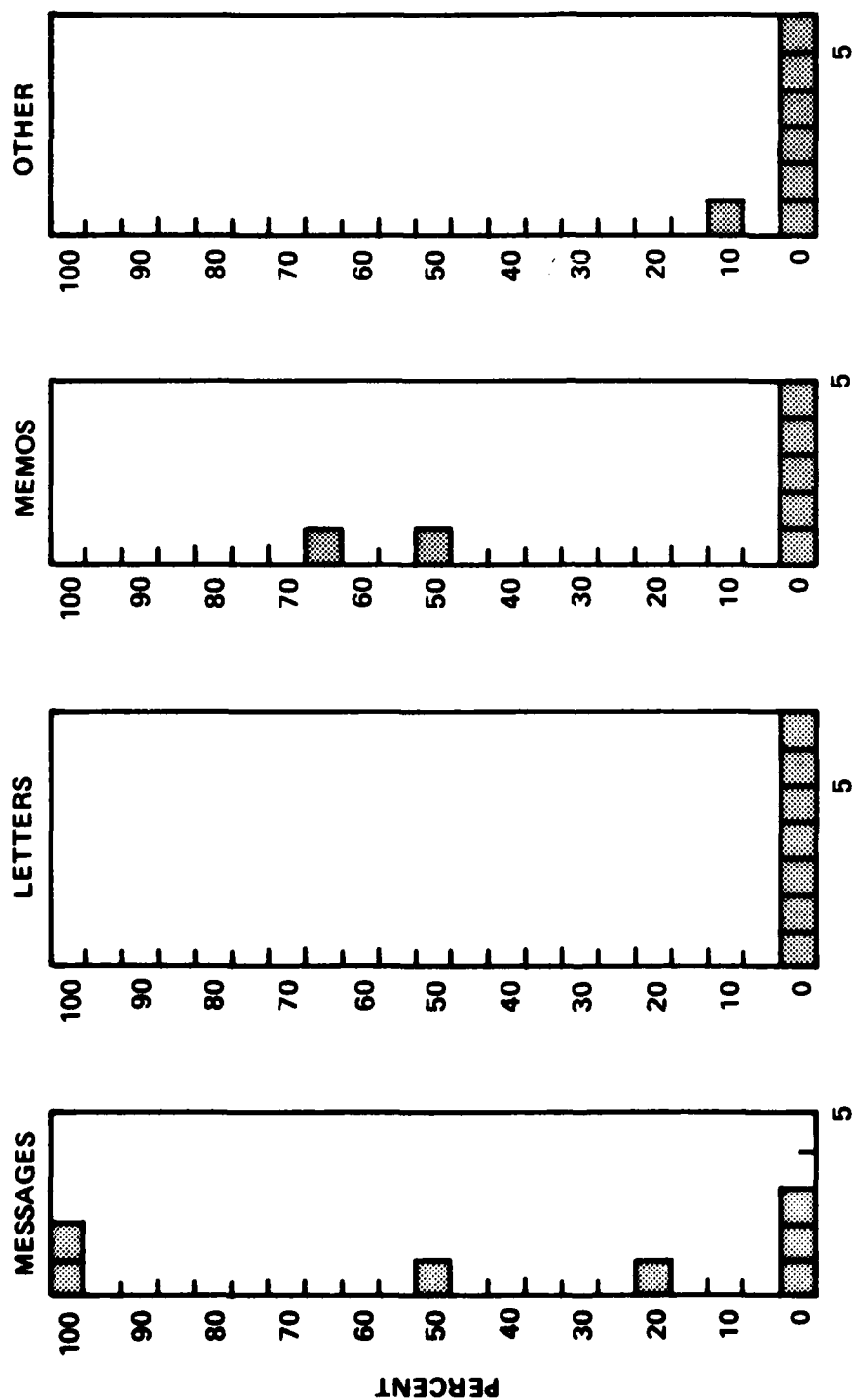


Figure 26. Distribution of Outgoing Communications by Type, Action Officers, Category 1 (Checksheets Data)

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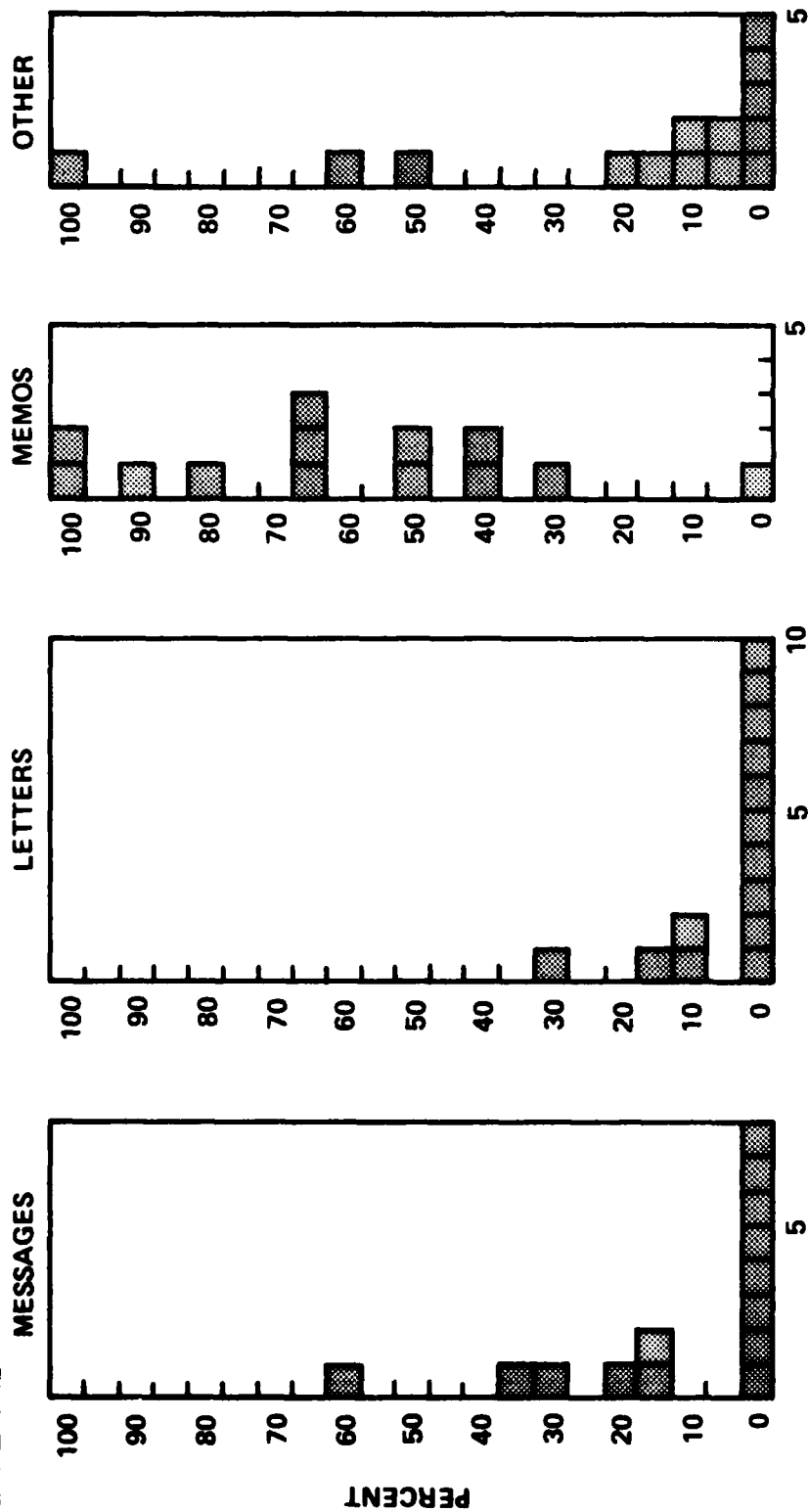


Figure 27. Distribution of Outgoing Communications by Type, Action Officers, Category 2 (Checksheet Data)

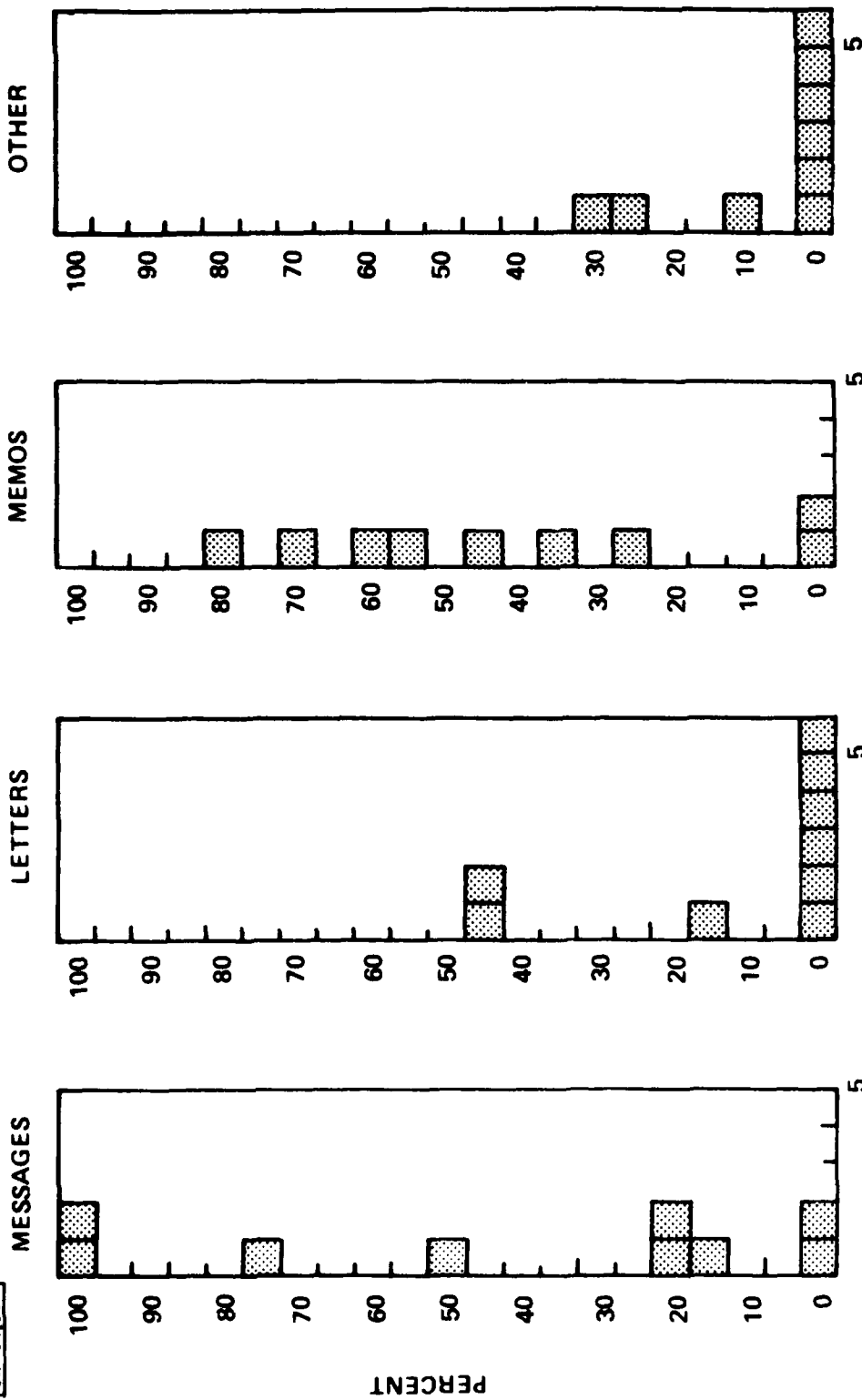


Figure 28. Distribution of Outgoing Communications by Type, Action Officers, Category 3 (Checksneet Data)

Immediate and Flash precedence messages are handled slightly faster than the routine and priority messages. Duty officers, however, are already handling the latter category very quickly, so that the difference is not as dramatic as that for action officers in terms of minutes saved. (For example, a duty officer may average 18 minutes preparing for an Immediate message rather than 24 for a Routine or Priority message). Similarly, the time it takes to get the message back from the clerk is generally less for a Flash or Immediate message, but the clerks are already returning Routine and Priority messages quickly.

COMMAND CENTER CLERKS

Some of the messages drafted in the Command Center are typed on a VIP terminal (CRT with on-line editing) and transmitted from the WWMCCS system through the LDMX to AUTODIN. Some messages are typed on OCR forms and transmitted from the Communications Center through the LDMX to the AUTODIN system. As a result of these procedures, only a small percent of the messages typed in the Command Center are retyped; many are edited on-line.

Checksheets were filled out by clerks on seven AM and seven PM shifts. The pattern of message drafting was the same for both AM and the PM shifts, although the PM clerks did spend more time typing messages (table 10). On five of each of the shifts messages were typed, but the number of these messages ranged from only one to three with an average of one per shift. On the AM shift an average of 5 minutes was spent on a message, while on the PM shift the average time was 14 minutes.

spent on correspondence and messages is, in fact, related to message drafting. Relatively few letters and memos are drafted.

The duty officers spend only a small fraction of an hour (one-fourth or less) preparing the message. Searching for references or reading them each take one-half hour or less.

Duty officers also ranked the various tasks associated with message drafting in order of the relative time needed to do the task. The trend of the ratings was (from most to least time consuming): analyzing the situation, preparing the address, planning the text, determining terminology, obtaining references, and listing references. This order is slightly different from that of the action officers. Preparing the address is ranked second instead of last; the other tasks are listed in the same relative order. Because of the small sample (five) of duty officers, one hesitates to attach significance to this difference in ranking.

The messages are typed and returned to the duty officer within one-half hour. Ten percent or fewer of the messages are retyped. This is due in part to the fact that some of the messages are typed on a computer terminal and are edited, but not completely retyped. Of the few messages that are retyped, only 10 percent are redone because the drafter wants to change the content of the message; the rest are redone to fix typing errors. Only three of the duty officers have messages retyped before having them put on OCR forms; these messages are retyped no more than twice. After the message has been put on the OCR form, it may be retyped once or twice; most officers said they only had messages retyped on OCR form once before sending the message to be chopped. Before this happens, duty officers usually consult informally with two other persons. Eighty percent or more of this consultation is done during face-to-face conversations. The rest occurs during telephone conversations.

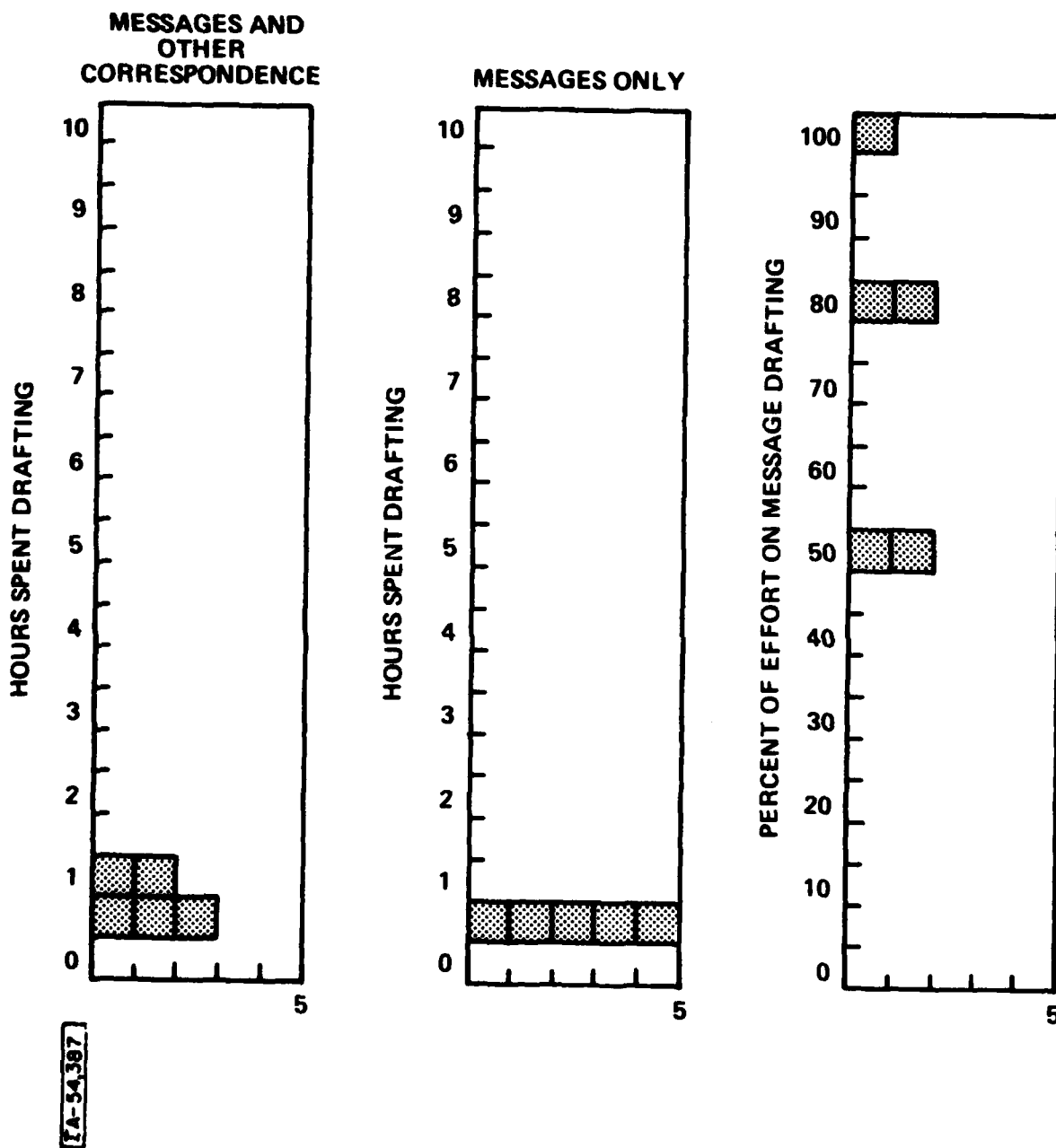


Figure 35. Estimated Daily Correspondence and Message Drafting Effort by CCWT Duty Officers

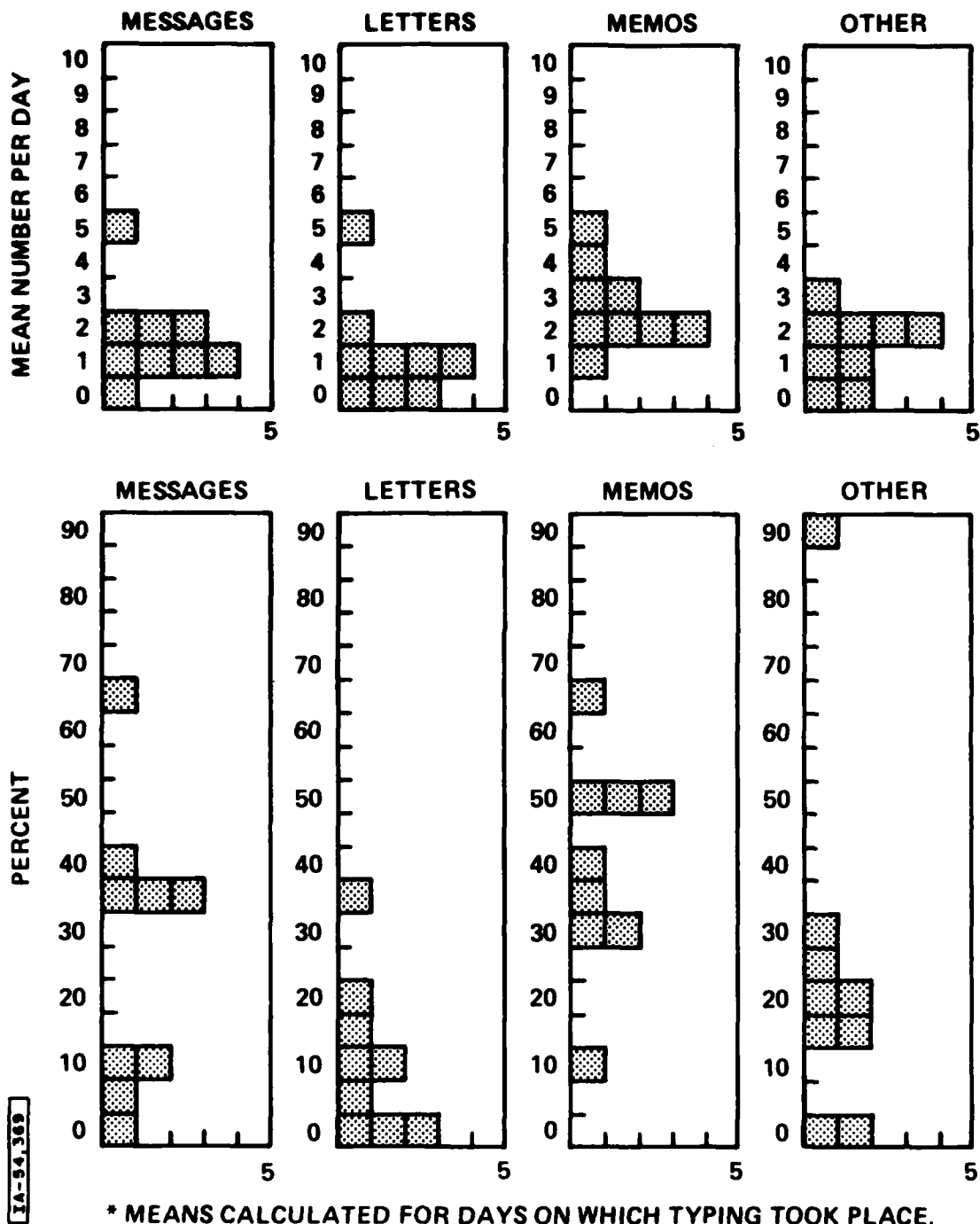


Figure 34. Distribution of Materials by Type, Clerical Personnel (1978 Checksheet Data*)

officers. The amount of time spent on typing tasks varies considerably and must be related to length of the items as well as the number typed.

The distribution of types of items is shown in figure 34. The proportions are similar to those reported by the officers with memos forming a slightly larger percentage of the workload than messages, and letters and other types of documents also represented in the workload.

Not all of the workload consists of first drafts of communications; often an item is retyped to incorporate changes by the author or to fix typographical errors. The amount of retyping varies from clerk to clerk with some claiming to retype all items, and others claiming to retype none. Most, however, said they retype about 15 percent of the drafts. Three clerks reported using mag/tape selectric typewriters for messages; this did not seem to have an effect on the amount of retyping necessary.

COMMAND CENTER DUTY OFFICERS

Only five of the nine duty officers who filled out questionnaires reported that they create messages. Two of the five are DDOs; the others are at the Surface Ops desk. These duty officers report creating messages at a slightly higher rate than the action officers: they averaged five messages per 3-day shift in contrast to the one-a-day reported by the action officers. The duty officers, however, spent less time on message creation than action officers.

Figure 35 shows the duty officers' responses to the question, "How much of your workday do you spend preparing correspondence and drafting messages? Drafting messages only?" The duty officers average less than an hour a day preparing correspondence and messages, and one-half hour or less on messages only. Between 50 and 100 percent of the time

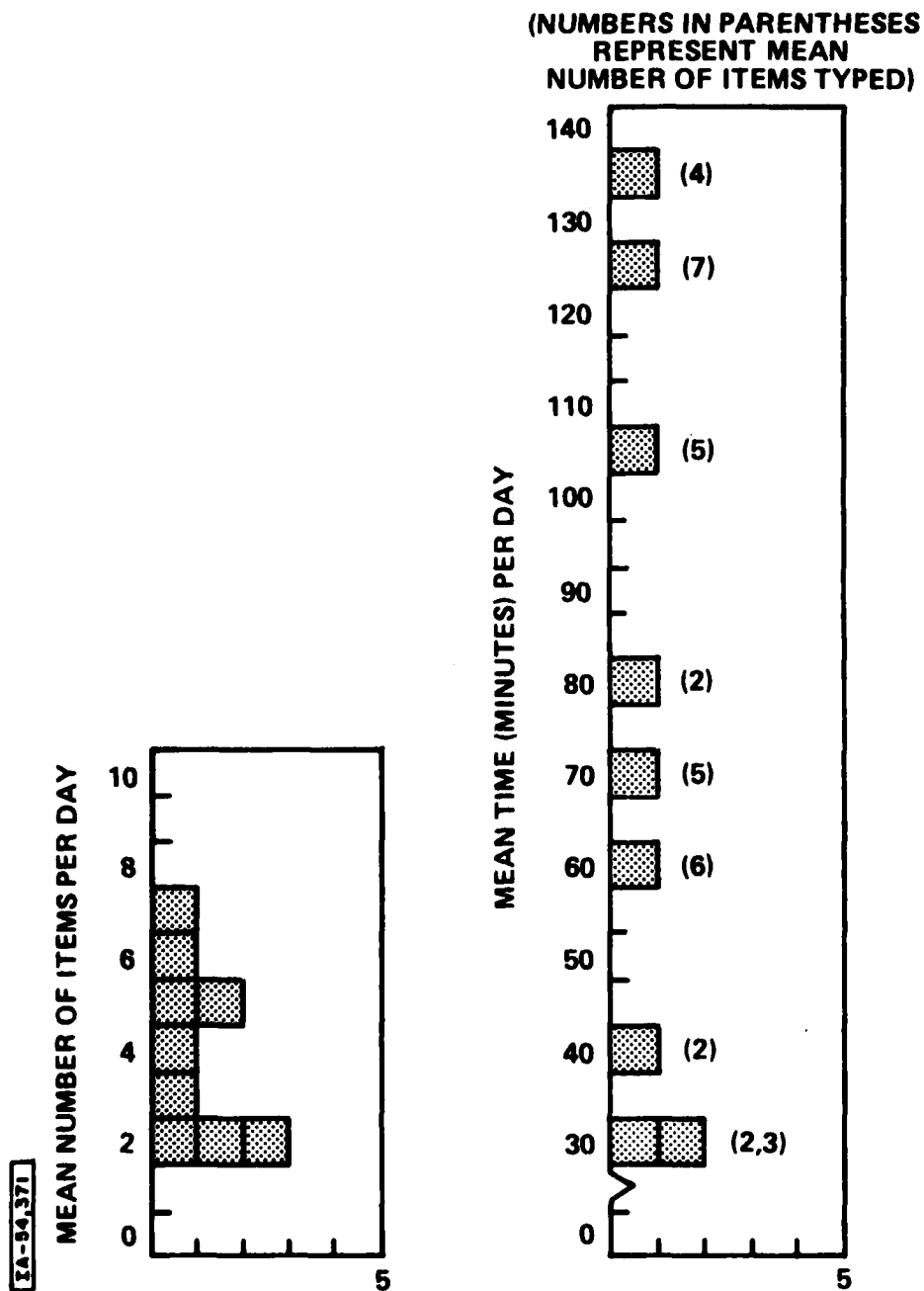


Figure 33. Daily Typing Effort by Clerical Personnel
(Checksheet Data)

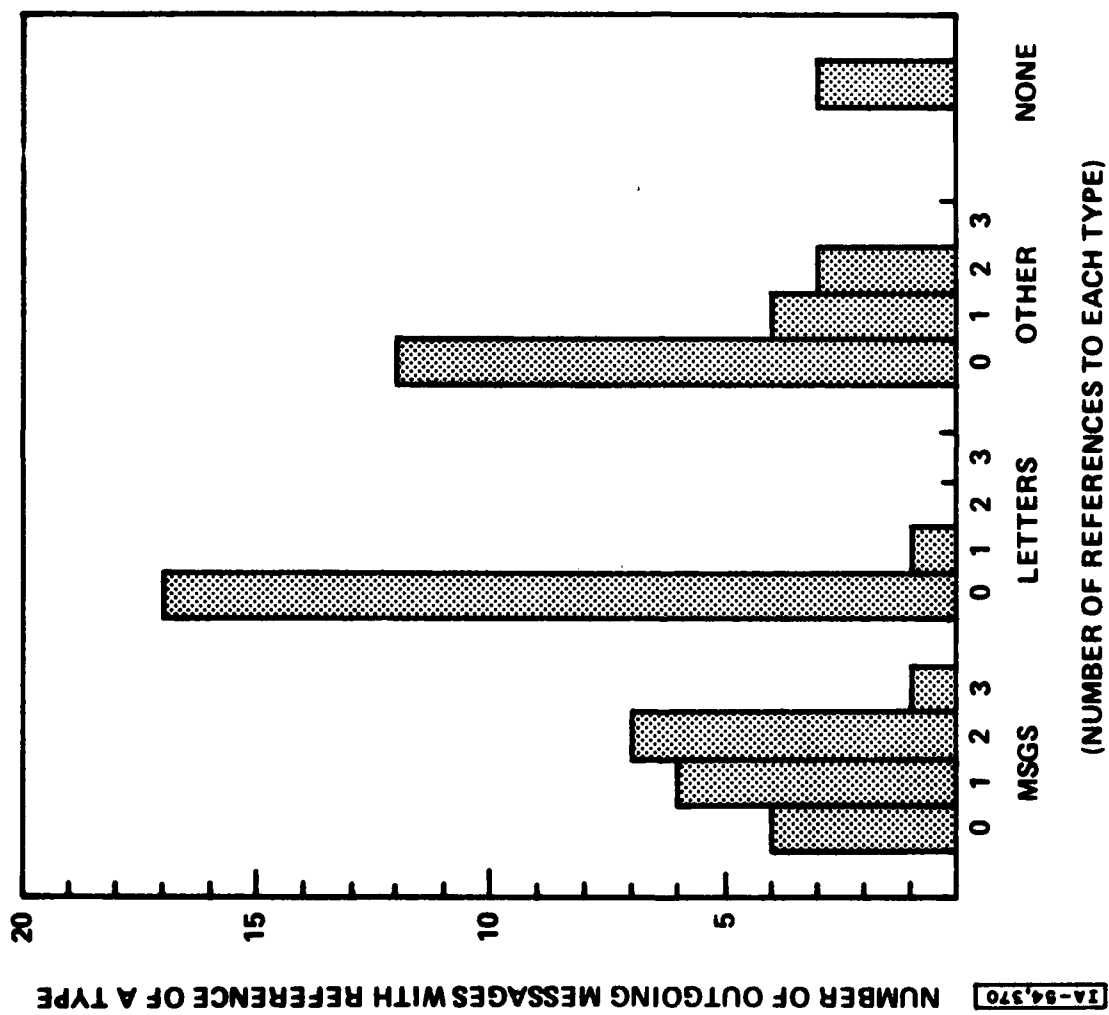


Figure 32. (concluded)

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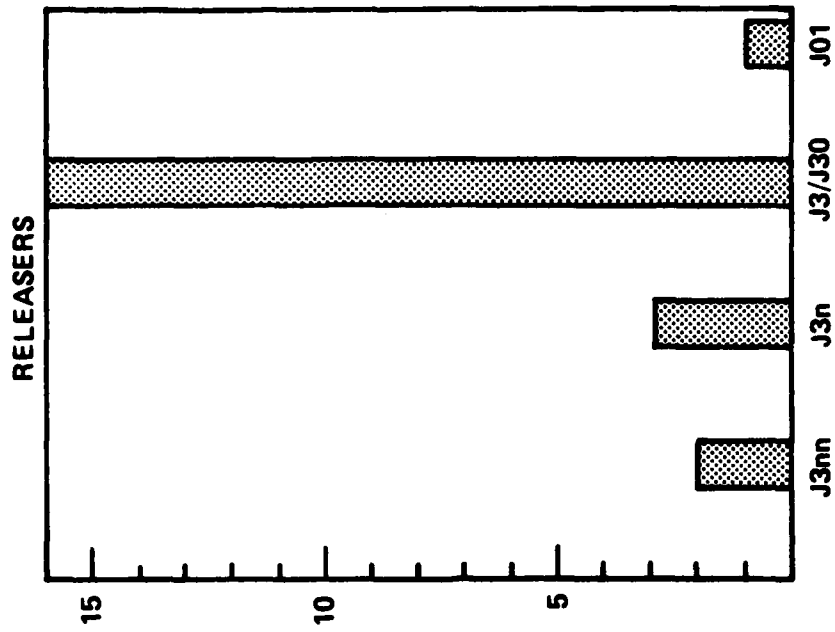
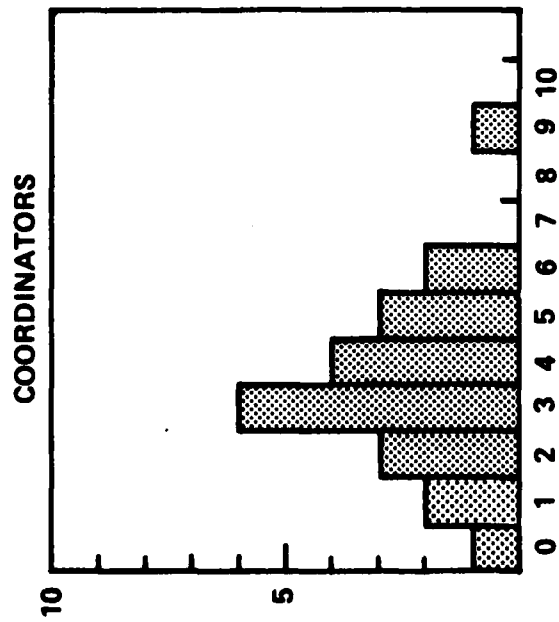
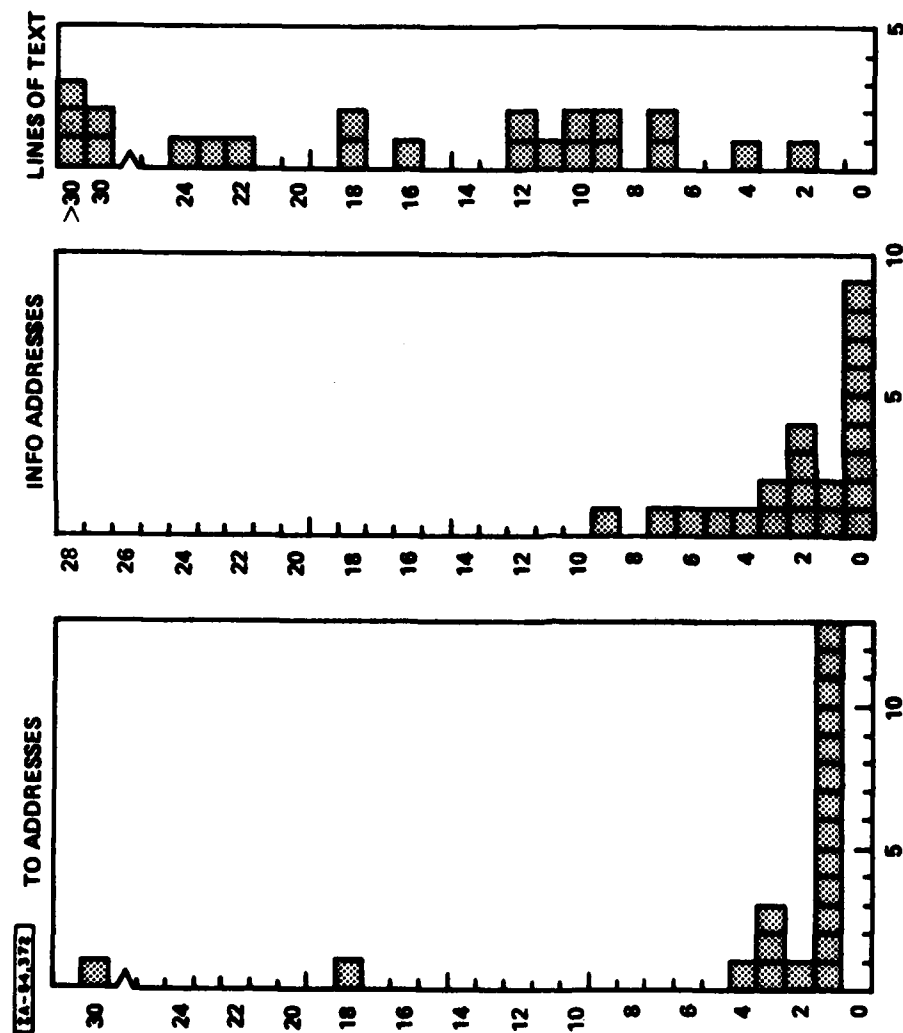


Figure 32. (continued)



* 14 MESSAGES WERE ROUTINE PRECEDENCE, AND 8 WERE PRIORITY.
 11 MESSAGES WERE UNCLASSIFIED, 4 CONFIDENTIAL, AND 7 SECRET.

Figure 32. J3 Outgoing Message Characteristics

No one reported having a message typed more than twice before having it put on the OCR form. Most said that on the average messages were typed once before being put on the OCR form.

Before the message is sent for coordination, the drafter may consult informally with colleagues. This consultation usually involves only two other persons and takes place during face-to-face conversations.

Message characteristics, such as length, number of addresses, and number and type of references, were recorded for 22 messages created within J3. (This was the sample available over a 10-day period.) These characteristics are presented in figure 32. They will be compared to characteristics of messages sent out on the on-line system to determine if any changes occur.

Messages of Immediate or Flash precedence are processed more quickly than routine and priority messages by the drafter and by the clerk. Usually the draft is ready to be typed within 2 hours of the drafter starting on it, and returned to the drafter within one-half hour after it has been given to the clerk for typing.

BRANCH ADMINISTRATIVE AND CLERICAL

The ratio of clerks to action officers varies from office to office; most clerks support three to five officers. Clerks are therefore expected to report typing more messages, letters, memos, and other documents than the officers report drafting.

Nine clerks and administrative personnel provided checksheet data in 1978. Typing tasks were reported by them at some time during the data collection period. As shown in figure 33, the average number of items typed was only slightly higher than the numbers reported by the action

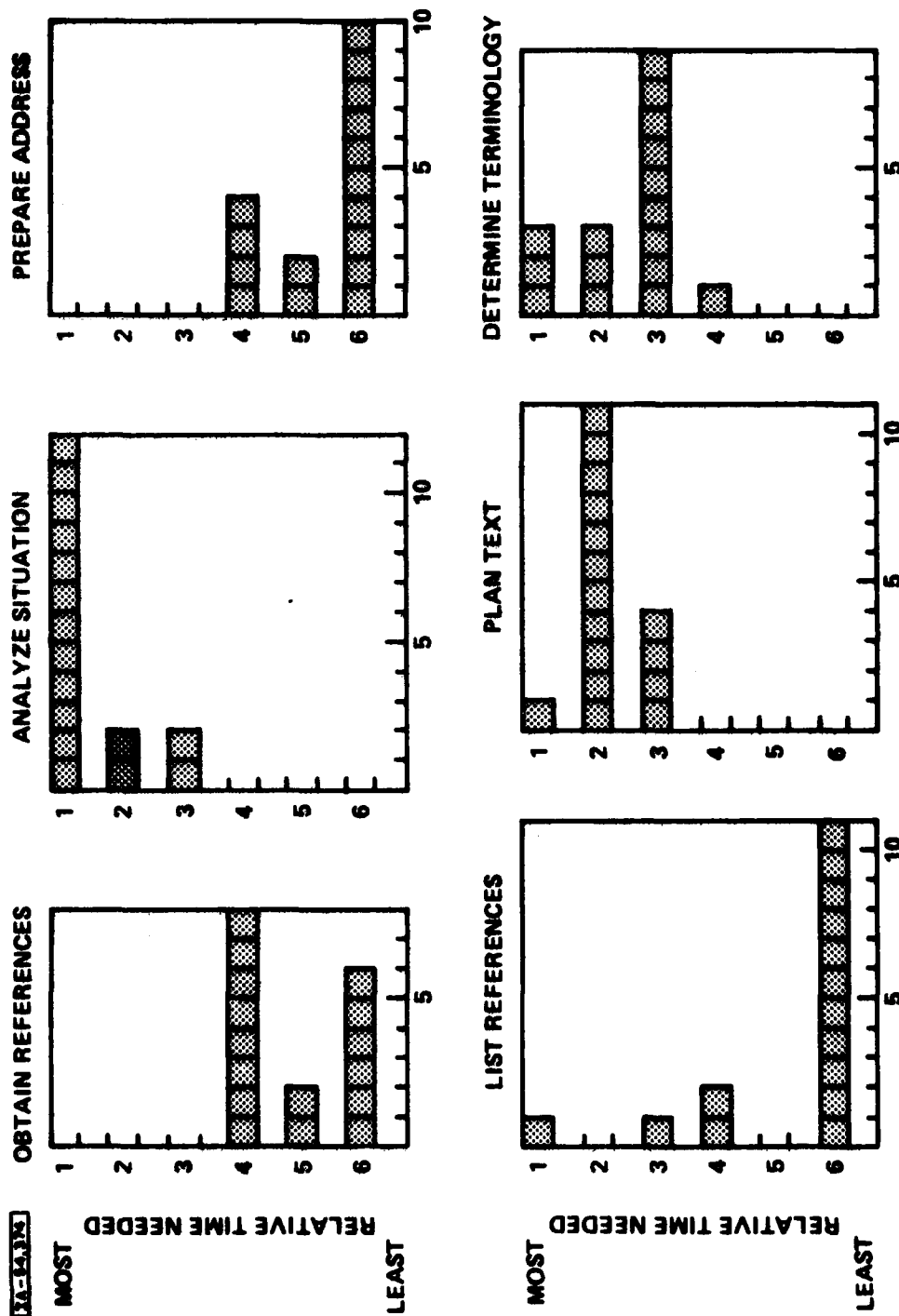


Figure 31. Message Preparation Tasks Ranked According to Time Needed by Action Officers

drafting the message, letter, memo, or document, and then reviewing the draft. As would be expected, gathering material and drafting the message take proportionally more time than reviewing the product. The mean time spent on these tasks varies from officer to officer, but generally less than 45 minutes are spent on any phase of the drafting process.

On their questionnaires officers ranked subtasks associated with message drafting according to how time consuming the tasks are; these rankings are shown in figure 31. The overall rankings show that analyzing the situation and deciding what needs to be said in the message are the most time consuming parts of message drafting. Planning and organizing the text is next, followed by determining the terminology of the text. The more routine tasks are less time consuming. Listing message correspondence and telephone references, obtaining copies of references, and determining and preparing the address do not take as much time as the more creative aspects of message drafting.

The draft is usually typed and returned to an officer within an hour of being given to the clerk; some officers do report waiting as long as 4 hours for their draft to be returned. Twenty percent or fewer of these drafts are then returned to the clerk to be retyped before the draft is sent for coordination. Although some of the retypings are caused by changes to the content of the message, 75 percent or more of the changes are due to typographical errors.

Eventually a message must be typed on an OCR form so that it can be transmitted. It is this form that is usually (but not always) circulated for coordination and release.

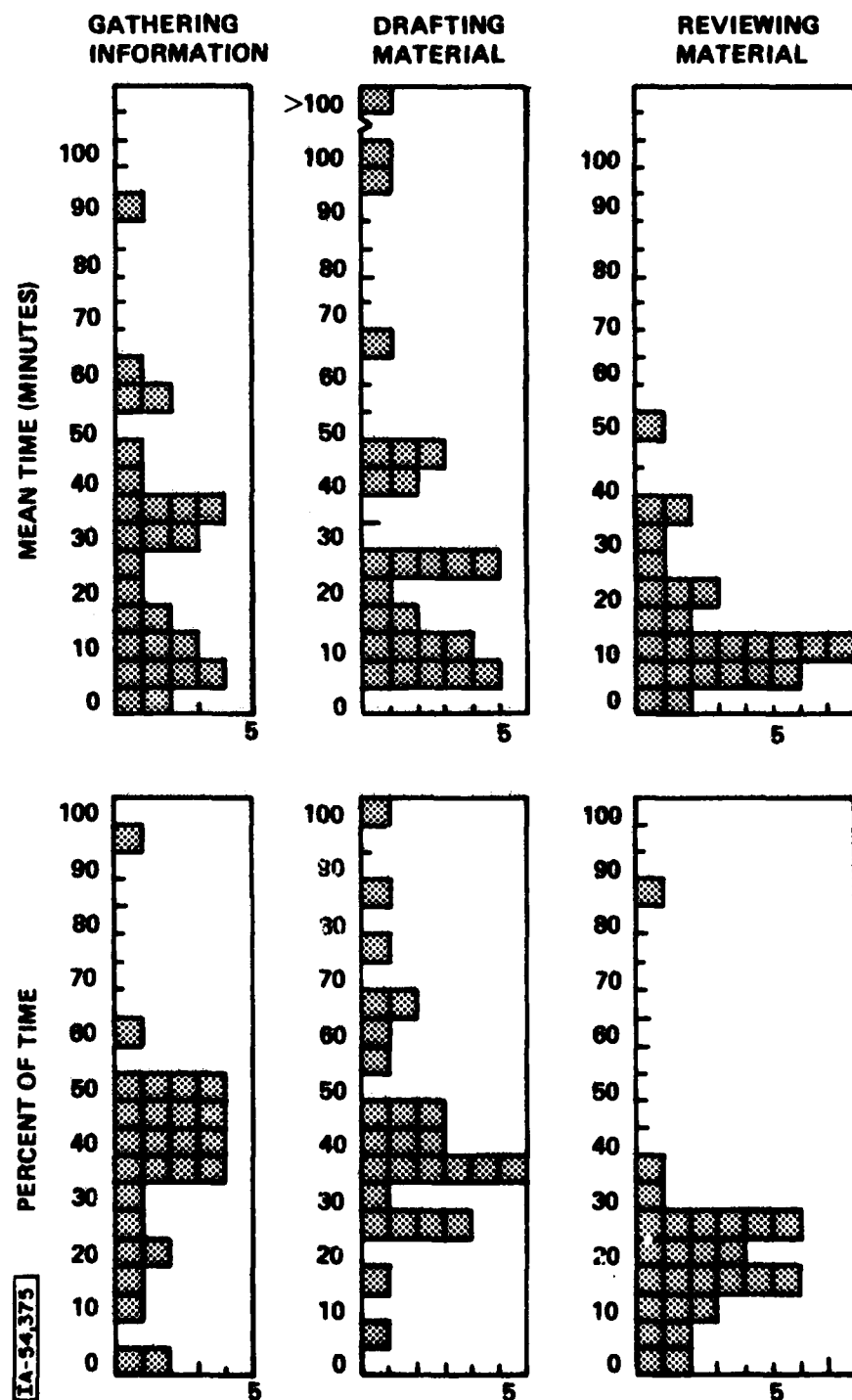


Figure 30. Distribution of Time Spent on Various Message Drafting Tasks
(Action Officers 1978)

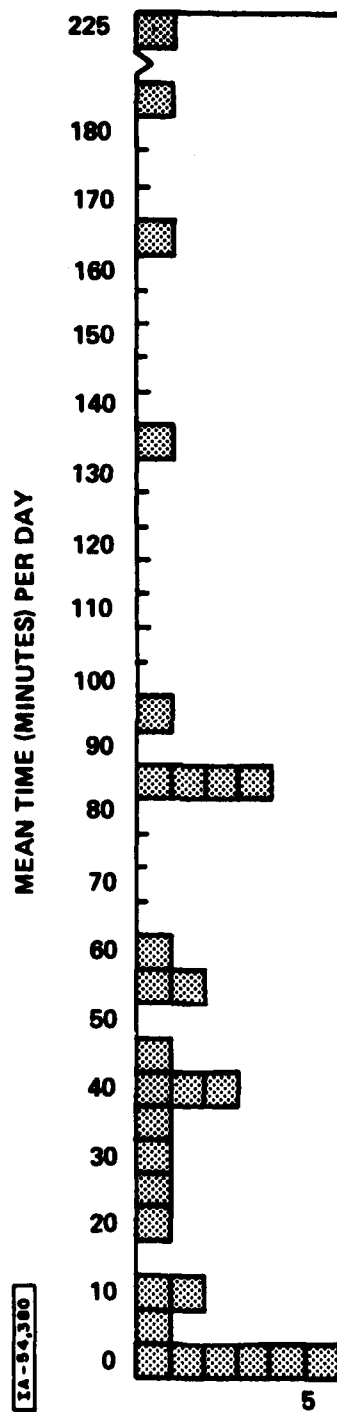


Figure 29. Daily Drafting Effort by Action Officers
(1978 Checksheet Data)

More letters and memos were typed by clerks on the AM than the PM shift. As shown in table 10, the PM clerks typed only two letters and no memos in contrast to the seven letters and four memos typed by AM clerks. In addition, all clerks average more time on letters than messages. Nevertheless, the message, letter, and memo typing loads are light for all shifts.

Table 10
Message, Letter, Memo Typing Effort by CCWT Clerks
(Checksheets Data)

	AM Shift	PM Shift
Messages		
Shifts	5	5
Total Messages	8	8
Mean Time/Message (Minutes)	5	14
Range of Times (Minimum-Maximum)	1-15	3-40
Letters		
Shifts	3	2
Total Letters	7	2
Mean Time/Letter (Minutes)	14	25
Range of Times	5-45	5-45
Memos		
Shifts	4	0
Total Memos	4	—
Mean Time/Memo (Minutes)	3	—
Range of Times (Minimum-Maximum)	3-5	—

SECTION 8

COORDINATION

ACTION OFFICERS

A message is coordinated before it is released and transmitted to ensure that the contents are accurate and that it represents an agreed upon position among the members of CINCPAC who may be involved with the message.

Action officers become involved in the coordination process as drafters whose messages need to be coordinated, and as coordinators whose comments and approval are needed on messages that other personnel have drafted.

The message may be sent through several levels of coordination with one or more persons at each level reviewing the message. For example, the message may be shown to several coworkers, a branch chief, and a division head. On the questionnaire action officers reported averaging between one and seven coordinators for their messages; more frequently, however, an average of two to four coordinators was reported. (On a sample of 22 outgoing messages in J3, zero to nine coordinators per message were reported. Most (13) of the messages had three to five coordinators. See figure 32.)

When the message is sent to coordinators, two to three pieces of background or reference material are usually sent in a folder with it. These materials may include a briefing memo, explaining the background of the message, references, or other pertinent messages and documents.

The coordinator may approve the message, or he may make comments and suggest revisions. Drafters report revising from 5 percent to 80 percent of their messages; most said they change 50 percent or fewer messages in response to coordinators' comments, and spend an hour or less on the revisions. The distribution of the action officers' responses to these questions is shown in figure 36.

As a result of these changes, messages are usually retyped once or twice before they are sent to the Communications Center for transmission.

The number of messages an action officer receives for his coordination varies considerably from position to position. Some action officers reported receiving only one message a week; others reported averaging 10 a week. Branch chiefs are among those receiving 10 messages a week for coordination; they are expected to coordinate on messages written by members of their branch, as well as messages originating outside the branch.

During the 1978 checksheet data-collection period, 10 of the action officers reported receiving messages, letters, memos, or other documents for coordination. Nine of these were located in category 2 and 3 branches, which work less with current, incoming action messages and more with longer term planning and activities. The 10 officers reported receiving messages, letters, etc., for coordination on 31 of the 83 days for which they had provided data. Most received only one item a day, although one officer reported coordination on five items on 1 day. On the average 26 minutes a day were spent on coordination tasks. (Times ranged from 1 to 120 minutes a day with most reporting 20 minutes or less daily.) Changes were suggested for half of the items coordinated.

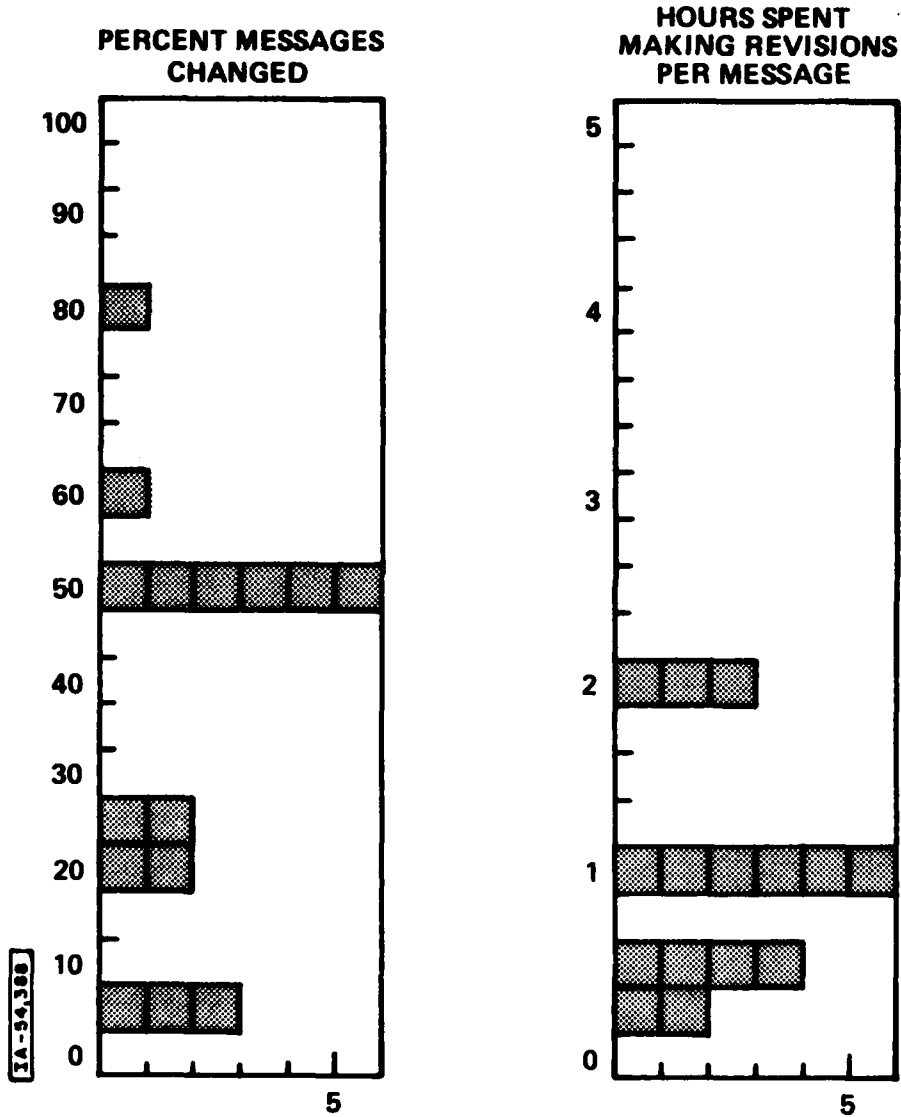


Figure 36. Effort Spent Revising Messages as Result of Chopper's Comments

The messages the action officer receives may originate in his branch, in his division but outside his branch, in J3 but outside his division, or outside of J3. The proportion of review and coordination time spent on messages from these sources is shown in figure 37. Action officers tend to spend the most time (40 percent) on messages that originate outside J3. They spent about the same proportion of time reviewing messages that originate within their branch (23 percent) and that originate in J3, but outside their division (20 percent). They spend the least time (15 percent) on messages originated in their division, but not their branch.

The pattern for branch chiefs is somewhat different. They spend most time (51 percent) on messages that originate outside of J3, followed by those within their branch (30 percent). Relatively little time is spent on messages that originate in the directorate (13 percent) or division (5 percent), but outside the branch. This pattern reflects the formal responsibilities of the branch chief. People outside of J3 who want consultation on messages tend to send them to the division chief, who may then pass them along to the appropriate branch chief. The branch chief may then distribute the messages to different members of the branch, or he may review them himself. The branch chief would also see most, if not all, of the messages that members of his branch are drafting.

Each message sent for coordination is generally accompanied by two or three pieces of reference material. However, the officer may still have questions he wants answered before he will approve the message. When asked how often additional information was needed, the action officers' answers ranged from never to 100 percent of the time. Most replies, however, fall in the 1 percent to 10 percent range, suggesting that most officers are usually provided with the information they need.

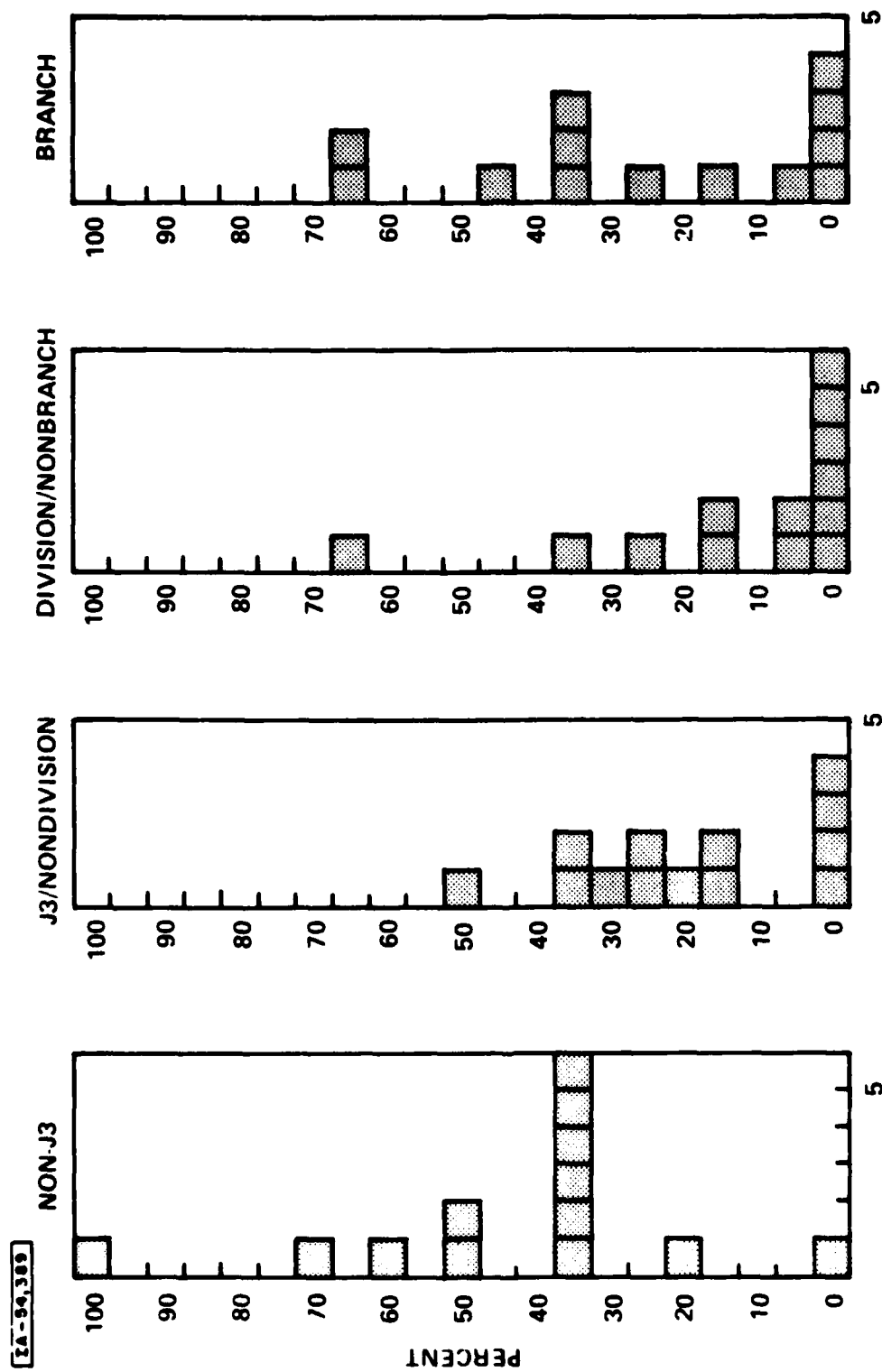


Figure 37. Percent of Coordination Time Spent on Messages from Various Sources

Although the coordinator may recommend changing the classification of a message, this seldom happens. The few respondents who indicated that they suggest changes in classification said that they did so for 5 percent or fewer of the messages they receive for chop.

COMMAND CENTER DUTY OFFICERS

Duty officers write fewer messages than other action officers; duty officers are also less involved in coordinating messages. Only six of the duty officers reported drafting messages. Three of these send their messages through only one level of coordination, and two others usually send their messages through two or three levels each. Most often only one piece of reference or background material is sent with the message.

Messages are seldom revised as a result of coordinators' comments. Half of the duty officers said they never revise their messages, while the other half said they revise 10 to 30 percent of their messages because of comments or suggestions for changes. These changes take less than 5 minutes for the officer to make.

In general, messages are coordinated and released more quickly in the Command Center than elsewhere. In part, this is because many of the messages originating in the Command Center are drafted on and transmitted using a VIP terminal connected to the WWMCCS system. These messages are generally reviewed within the Command Center and do not have to be retyped to be edited. In addition, many of the messages are standard messages, which do not vary greatly from day to day.

SECTION 9

RELEASE

After a message has been coordinated, it must be released before it can be transmitted. Action officers do not release messages. Most releasing is done by the Director or his deputy. Some are done by division chiefs.

The message may be released with changes the drafter has not seen. Two-thirds of the action officers and branch chiefs report that they have had messages released without them having a chance to see the changes. This does not occur frequently, however. Although one action officer said this happens to 20 percent of his messages, the rest said it happens to 10 percent or fewer messages. The majority said that 5 percent or less of their messages are changed and then released without them having a chance to review the changes.

For a Routine or Priority message, the combined coordination and release process may take from 15 minutes to 24 hours. Most often, the message is released within 5 hours of its submission to the first coordinator. Flash and Immediate messages are coordinated and released more quickly. Although two officers reported that these messages occasionally took 5 to 6 hours to be coordinated and released, most officers reported that Flash and Immediate messages are processed in 1 hour or less.

No division chiefs or deputies answered questionnaires. One of the deputies offered to be interviewed. He reported that message release is a fairly routine task. The Director releases most of the messages, although

the division chief may occasionally release messages. In most cases these are routine (day-to-day) messages, which he can release after a glance. The releaser relies on the staff work done by members of the division. Nonroutine messages are read more carefully but are also less frequent.

On some occasions a branch chief, who is the senior officer under the division chief, may release messages because the division chief is unavailable. He does so as acting division chief rather than as branch chief.

The DDO has authority to release messages, but generally does so only after hours when the Director and division chiefs are unavailable.

Of the sample of 22 outgoing messages mentioned earlier, 16 were released by the Director or his deputy acting as director, three were released by division chiefs, two by branch chiefs, and one by J01, the Chief of Staff.

SECTION 10

TRANSMISSION AND POST-TRANSMISSION

TRANSMISSION

After a message has been released, it is sent to the Communications Center for transmission over the AUTODIN system. In J3, many of the outgoing messages are brought to the Command Center, which has a direct pneumatic tube link to the Communications Center.

The Communications Center operates 24 hours a day. Outgoing messages are processed throughout the day and night with the rate varying according to the time of day and day of the week. Between 1400 and 1600 local time, the volume of outgoing messages increases; it also increases toward the end of the week.

As outgoing messages arrive in the Communications Center for transmission, the Communications Watch Officer (CWO) time-stamps the message and checks the following: format correct, releaser authorized to release messages, releaser's signature authentic, etc. If the message is of Immediate or Flash precedence, it is given to a clerk to be processed immediately; otherwise, it is put in a tray to be processed as soon as a clerk can get to it.

The clerk processes messages by precedence. A DTG is assigned to the message, and it is fed to an OCR machine. If this machine accepts the message, the LDMX transmits it and assigns a sending time. If the message is not accepted, the clerk tries to fix the error. If this is not possible, the message may be sent back to the Directorate for retyping. Acceptance by

the OCR is often affected by the adjustment of the machine. Sometimes 80 to 90 percent of the messages are rejected on the first try.

On a sample of 15 messages created in J3, the average processing time for a message was measured from the time the Communications Center received the message to the time the LDMX processed the comeback copy. (The latter time is usually the same as the time the LDMX sent the message.) The average processing time for Priority messages was 76 minutes; for Routine messages it was 131 minutes. Data on Flash and Immediate messages are not available; these messages are processed directly upon their receipt.

On a larger sample of 115 outgoing messages from all of CINCPAC sent between 0001 GMT (Greenwich Mean Time) and 0500 GMT, processing time was measured from the time the message was received in the Communications Center to the time the LDMX sent the message. The mean processing time for Priority messages was 120 minutes; for Routine messages the mean processing time was 202 minutes. These times are higher than those given for the J3-only sample above; this reflects the fact that more messages are received in the Communications Center between 1400 and 1600 local time (0200 GMT to 0400 GMT) than during other periods of the day, and processing is thus slower. These data do provide a "worst-case" estimate, which the computer system can improve upon.

POST-TRANSMISSION

After a message has been transmitted, a comeback copy is processed by the LDMX and delivered to the originating directorate and other directorates designated in the drafter distribution field on the form sent to the Communications Center. Action officers say that it takes from 2 to 24 hours

to receive a comeback copy for Routine and Priority messages; comeback copies of Flash and Immediate messages are delivered somewhat faster.

When the comeback copy is produced, it is treated like any other incoming message. See section 3, Message Distribution.

SECTION 11

CRISES AND EXERCISES

During a crisis or exercise an Operations Action Group (OAG), an Operations Planning Group (OPG) and a Current Operations Support Element (COSE) are formed to handle the situation. The OAG operates from the Command Center and is the focal point of the special groups.

The DDO, Surface Ops, and Air Ops duty officers remain on duty in the Command Center. They continue to monitor nonexercise traffic and day-to-day operations not directly related to the crisis, as well as supporting the OAG if necessary. The overall number of messages being transmitted during these periods may not increase dramatically; there is, however, a tendency for the number of high precedence messages, requiring immediate attention, to increase.

An exercise with limited J3 participation took place during the 1977 baseline data collection period. Checksheets were being filled out in the Command Center at this time. The exercise team did not provide checksheet data; however, the duty officers did continue recording estimated numbers of messages and time spent on message-related tasks. In addition, several items on the questionnaires dealt with crises and exercise conditions. More data will be collected during an exercise when it is feasible to station an observer in the Command Center.

MESSAGE REVIEW

Duty officers were not directly involved in the exercise; their workload was, however, affected. Table 11 shows message review effort for duty officers during exercise and nonexercise checksheet record-keeping sessions. (J3 participation in the exercise lasted about 3 days. This participation took place over a weekend. Data in table 3 suggest, however, that there is not a large change in general message volume that would account for differences in workload.)

The number of messages the DDO scanned and read increased significantly during the exercise; the amount of time he spent increased almost sevenfold.

Table 11
Exercise vs. Nonexercise Message-Handling by CCWT Duty Officers

	DDO		Air Ops		Surface Ops	
	Nonexercise	Exercise	Nonexercise	Exercise*	Nonexercise	Exercise
Messages Scanned						
Mean	50	195	322	142	222	226
Range	0-190	170-243	111-507	102-133	167-253	205-244
Messages Read						
Mean	20	114	61	12	45	56
Range	2-27	86-133	7-118	8-19	15-109	38-84
Time Scan/Read (Minutes)						
Mean	65	448	154	122	149**	144***
Range	10-176	330-654	41-257	115-135	45-300	94-194

* One Air Ops duty officer reported he was too busy during the exercise to keep records.

** Based on reports for eight shifts.

*** Based on reports for two shifts only.

The message review workload of the Air Ops officer decreased during the exercise; he scanned and read fewer messages than during the non-exercise period and spent less time on the messages as well. It should be noted, however, that the values logged on the checksheets may be somewhat misleading, since one of the Air Ops officers on duty during the exercise noted that he was too busy to record his activity.

The Surface Ops records show no change in message review activity. The number of messages scanned and read increased slightly. Incomplete timing records are available, so one cannot be sure that the time spent on the tasks did not increase.

MESSAGE DISTRIBUTION

The number of messages readdressed, opened, and distributed by the Air Ops and Surface Ops duty officers did not change during the exercise period. The DDO, however, did become more involved in these tasks while the exercise was being conducted.

Data from 12 shifts were supplied by DDOs during nonexercise periods. Only once was message distribution activity reported. During the exercise, three DDO shifts provided checksheet data; message distribution was reported for all three shifts. The contrast in time and volume of messages handled is shown in table 12.

These values, with the message review values, suggest that the DDO's message-oriented workload increases during an exercise, even though he is not directly involved in handling the exercise situation. The DDO's role of Command Center director requires that he be aware of developing situations. It may result in his closer following of nonexercise traffic to ensure that nothing important is missed, while attention is focused on the exercise.

Table 12
DDO Message Distribution During Exercise Period

Distribution	Nonexercise	Exercise
Days Task Noted	1	3
Messages Distributed		
Mean	40	100
Range	—	56-128
Time on Tasks (Minutes)		
Mean	23	178
Range	—	60-384

MESSAGE DRAFTING

Messages provide formal, record communications. When an officer is involved in a crisis or exercise, the need for this type of communication increases. Officers then draft a larger number of messages than they ordinarily do. Because of their greater urgency, these messages tend to be of higher precedence than messages written by the action officers during normal periods.

As reported earlier, high precedence messages are generally drafted, chopped, released, and transmitted more quickly than routine or priority messages. See section 7, Creation and Drafting, for further details.

LIST OF REFERENCES

1. MME Master Test Plan, Naval Electronic Systems Command, 28 November 1978.
2. S. W. Slesinger and N. C. Goodwin, "Test Procedures for Military Message-Handling Experiment," MTR-3521, Contract F19628-78-C-0001, Bedford, Mass. : The MITRE Corp. , October 1977.

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