UNCLASSIFIED

AD NUMBER
AD851433
LIMITATION CHANGES
TO: **Approved for public release; distribution is unlimited.**
FROM: **Distribution authorized to U.S. Gov't. agencies and their contractors; Administrative/Operational Use; APR 1967. Other requests shall be referred to Office of the Chief of Staff (Army), Washington, DDC 20310.**
AUTHORITY
OCS D/A ltr, 21 Jan 1980

THIS PAGE IS UNCLASSIFIED

THIS REPORT HAS BEEN DELIMITED
AND CLEARED FOR PUBLIC RELEASE
UNDER DOD DIRECTIVE 5200.20 AND
NO RESTRICTIONS ARE IMPOSED UPON
ITS USE AND DISCLOSURE.

DISTRIBUTION STATEMENT A

APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED.

AD851433

ARC

ART AND REQUIREMENTS OF COMMAND

DDC FILE COPY

VOLUME I
SUMMARY REPORT

prepared for

Office of the Director of Special Studies
Office of the Chief of Staff
Department of the Army

Contract No. DA 49-092-ARO-154

D C
MAY 6 1969
C

THE FRANKLIN INSTITUTE RESEARCH LABORATORIES

(14) TR-1-191-Vol-1

(9) Technical Report, 1-191

(6) ART AND REQUIREMENTS OF COMMAND (ARC).

VOLUME I: SUMMARY REPORT.

by

(10) Joel N. Bloom
Adele M. Farber

(11) Apr[redacted]67 (12) 41p.

prepared for

Office of the Director of Special Studies
Office of the Chief of Staff
Department of the Army

(15) *Contract No.* DA-49-092-ARO-154 new

THE FRANKLIN INSTITUTE RESEARCH LABORATORIES
SYSTEMS SCIENCE DEPARTMENT

NOTICE

The contents of this report, including the conclusions and recommendations, represent the views of the contractor and should not be considered as having official Department of the Army approval, either expressed or implied.

FOREWORD

The "Art and Requirements of Command", which is Phase I of an effort directed toward identifying and analyzing the command-control support requirements of senior commanders, was conducted by the Systems Science Department of the Franklin Institute Research Laboratories (FIRL). This study was prepared for the Office of the Director of Special Studies, Office of the Chief of Staff, Department of the Army.

This study represents a departure from the traditional systems approach to command-control. The subject is approached from a behavioral point of view; the focus throughout is the commander—his requirements for communicating and for receiving objective and subjective information. This difference in focus and approach generated considerable interest and induced The Franklin Institute to make available supplemental support for the program from its own resources.

This volume, *Summary Report*, describes the methodology employed in Phase I and the overall objectives of the entire study effort. Phase I study findings are presented and a detailed, four-stage description of the command process is included. In addition, a preliminary command-control support requirements model is developed.

Volume II, *Generalship Study*, is the product of a major study effort. A "generalship" or "command" questionnaire was developed by General Bruce C. Clarke, USA Retired, Consultant, and FIRL staff members, and distributed to 150 active and retired general officers. On the basis of more than 80 replies, a composite command portrait was developed. This volume, prepared by General Clarke, General John G. Hill, USA Retired, and FIRL staff members, contains a compendium of selected questionnaire responses.

Volume III, *Historical Studies*, summarizes a composite command portrait developed on the basis of review of selected past commanders. This study was performed by Col. Wesley W. Yale, USA Retired, and Gen. I. D. White, USA Retired, consultants to The Franklin Institute; and by members of the Institute staff. It serves as a basis for comparing past with contemporary command methods, techniques, and procedures and provides valuable insights into many aspects of the command process.

Volume IV, *Seventh Army Command Process Study*, covers another major study effort. The study was performed by Colonel Wesley W. Yale, USA Retired, and General I. D. White,

USA Retired, consultants to The Franklin Institute; and by members of the FIRL staff. It summarizes the command-process description and analysis developed through a questionnaire-interview program. In this volume, common patterns of Seventh Army command methods, techniques, and practices are identified and integrated into a composite command portrait.

The study objectives, approach, and scope of this effort required a broad interdisciplinary team of researchers. Joel N. Bloom, Technical Director, Systems Science Department, FIRL, served as Project Engineer. Principal contributors to the project were as follows:

Contributors	*Area(s) of Specialty*
FIRL Staff	
Bloom, J. N.	Operations research and communications
Braybrook, W., CAPT, USN Ret.	Command and operations research
Farber, A.	Political science and history
Ferry, P.	Operations research
Levy, A., Dr.	Political science and sociology
Silver, C., Dr.	Psychology
Consultants	
Clarke, Bruce C., GEN, USA Ret. (Senior Consultant)	Command
Hill, J. G., BG, USA Ret.	Command and military operations research
White, I. D., GEN, USA Ret.	Command
Yale, W., COL, USA Ret.	Command and military operations research

ACKNOWLEDGMENTS

The authors acknowledge with thanks the assistance of Generals C. H. Bonesteel, III and J. L. Throckmorton, successively the Directors of Special Studies, OCSA; and Colonels D. P. McAuliffe and B. C. Burnell, successively the Deputy Directors. Special thanks is due Colonel J. P. Barker and Lietenant Colonel W. R. Wolfe, Jr., Office of the Director of Special Studies, OCSA, who served successively as point of contact in the sponsor's office.

Particular thanks is also due the more than one hundred active and retired general officers, and the numerous students of the Army War College and the Army Element at the National War College, who generously and fully shared their experience and insights with the study team. Without their cooperation and enthusiastic support the study could not have been conducted.

The authors also thank Mr. Bernard E. Epstein for editing this volume of the report, and Misses Peggy Toon and Myra Bach for typing and drafting assistance.

PRECEDING PAGE BLANK-NOT FILMED

SUMMARY

This report describes the results of Phase I of a three-phase study program directed toward identifying and analyzing the command-control support requirements of senior commanders. Conventionally, command-control systems have been studied and developed from the perspective of the information-systems analyst and then presented to the commander. Yet, in the military establishment, the senior commander represents the unity of command and of control. The focus must, accordingly, be the commander and all systems must be designed around his requirements.

This study, "Art and Requirements of Command", is based on the premise that high-level tactical command (generalship) is a highly personalized art as well as a clearly defined professional discipline. As long as the command-control function is exercised by commanders relying principally on other humans for support, training and individual experience need to be emphasized in doctrine and in the development of requisite command-control support systems. With the increasing use of systems technology, however, the "rules" of generalship must be stated explicitly enough that commander, staff, subordinates, and equipment can be properly matched to form an effective support system. It is to this goal that the overall project is directed.

Phase I of the study had three specific objectives:

1. Develop and test a methodology for studying the art and requirements of command.

2. Document the principles and techniques of command by means of a composite portrait of the commander in the command process.

3. Develop a preliminary command-control support requirements model which can be used as the basis for more detailed studies.

Methodology Development

The methodology for studying the art and requirements of command was developed from three lines of inquiry: a questionnaire and interview program directed at general officers; a historical study; and a study of the Seventh Army command process. Data collected from these inquires were integrated and analyzed by an interdisciplinary team of operations analysts, social scientists, and experienced senior commanders.

Commander-Command Portrait

A composite command-process description was developed for each of the three parallel studies. These were, in turn, merged into a comprehensive command portrait (or analytical description) through application of a general framework developed specifically for this purpose.

Preliminary Model

A preliminary command-control support requirements model was developed from the command principles and techniques extracted from the composite command portrait. The model defines physical, psychological, and organizational factors which determine the potential effectiveness of the people in the command-control support system. Because these factors are affected by changes in technology, organization, and personnel practices, future study phases will determine their precise interrelationships; these relationships will guide the effective matching of commander, staff, subordinates, and equipment to achieve flexible, adaptive command-control support systems.

Conclusions

Phase I investigations and analyses have led to the following general conclusions:

1. *Study of the command process through the key figure in that process, the senior commander, yields valid and useful results.*

2. *The commander's basic problem is effective acquisition and dissemination of information.* Information transfer to and from the commander involves both objective and subjective information: the commander not only sees, hears, and says, but also senses and is sensed.

3. *Face-to-face personal contact between the commander and his staff and subordinate commanders is an essential part of the command process.* Command is primarily a "people process" rather than a formal system; successful commanders are

effective because they are people- rather than systems-oriented. Before World War II, required information was transferred to and from the senior commander primarily by the skillful use of people. Although existing communications devices were used to their fullest capacity, their scope and range were limited in comparison with presently available systems. Despite these limitations, the results were almost universally excellent; information reached those who required it and the human channels for its transmission worked efficiently. Senior commanders in World War II and Korea had available to them more sophisticated communications systems. Again, although they clearly indicate that these systems were used maximally, these commanders almost universally maintain that direct, face-to-face contacts with staff and subordinate commanders were often the most effective means for gathering and disseminating information. General officers who have served in Vietnam have expressed precisely the same views. The communications mechanisms available in Vietnam are far more reliable and efficient than those available to World War II commanders; these are employed extensively at all command levels. However, general officers continue to express the belief that personal visits and personal reconnaissance cannot be supplanted by technological devices; *both* technology and personal contact are essential to the successful exercise of command.

The present trend toward increased centralization at all levels, and the extended coverage of military operations by the press and mass media, may reinforce this preference for face-to-face personal contact. High-level commanders in Vietnam, for example, are concerning themselves more and more with the operational details of relatively small units. Although technology certainly helps satisfy such demands for more detailed information, personal visits are more frequently resorted to as well.

4. *The commander's information demands and requirements are so great that even technology and personal contact combined cannot be relied upon for their total satisfaction; partial substitutes or human filtering mechanisms are necessary.* The preliminary command-control support-requirements model provides a basis for evaluating partial substitutes for the commander's personal presence and for developing flexible, adaptive, and efficient command-control support systems.

5. *A program for the continuing and extensive debriefing of senior commanders is needed.* This program should provide for the review of after-action reports and maneuver critiques. Questionnaires and interviews should be developed; seminars should be organized to promote discussion of problem areas; and carefully structured debriefing sessions should be designed to elicit relevant information about the art, mechanisms, and requirements of command.

   Data obtained from this program would provide source materials for instruction in senior service schools and would serve as the basis for systematic inquiry into the effects of changes in support organization, doctrine, and equipment.

   This debriefing program should be institutionalized within the Army structure, with outside contractual support as required. Active and retired general officers should be included in an Army group to provide the military and command expertise which is critical to any such program. Outside contractual support could provide the requisite interdisciplinary skills and the informality and independence necessary to elicit full response.

William M. Braybrook, Manager
Operations Research Laboratory

Approved:

Joel N. Bloom, Technical Director
Systems Science Department

TABLE OF CONTENTS

Section	Title	Page
Summary		vii
SECTION 1.	PROGRAM OVERVIEW	
	Phase I	2
	Phase II	4
	Phase III	5
SECTION 2.	STUDY APPROACH AND METHODOLOGY	
	Introduction	7
	Methodology	7
	Parallel Lines of Inquiry	10
	A Framework for Description	11
SECTION 3.	COMMAND-PROCESS DESCRIPTION	
	Introduction	15
	Stage 1, Mission Evaluation and Interpretation	16
	Inputs	17
	Input Mechanisms	21
	Output and Output Mechanisms	24
	Stage 2, Issuing of Directive	25
	Inputs	25
	Input Mechanisms	27
	Output and Output Mechanisms	28
	Stage 3, Monitor Development, Preparation, and Issuance of Coordinated Plans and Orders	29
	Inputs	29
	Input Mechanisms	29
	Output Mechanisms	32
	Outputs	34
	Stage 4, Follow-Up and Evaluation During Operations	34
	Inputs	34
	Input and Output Mechanisms	36
	Output	39
	Conclusion	40
SECTION 4.	PRELIMINARY MODEL FOR EVALUATING EFFECTIVENESS OF INFORMATION-TRANSFER MECHANISMS	
	Introduction	41
	Underlying Postulates	41
	Command as an Information-Transfer Process	43
	Information "Filters"	46
	A Filter-Distance Model	49
	Application of the Filter-Distance Model	50

LIST OF ILLUSTRATIONS

Figure	*Title*	*Page*
1.	Block Diagram of Program Overview	3
2.	Block Diagram of Methodology	8
3.	Framework for Description	12
4.	Stage 1, Mission Evaluation and Interpretation	18
5.	Stage 2, Issuing of Directives	26
6.	Stage 3, Monitoring of Staff	30
7.	Stage 4, Follow-Up and Evaluation	35
8.	Basic Information-Flow System	43
9.	Partially Expanded Diagram of Basic Information-Flow System	45
10.	Fully Expanded Diagram of Information-Flow System	47

LIST OF TABLES

Table	*Title*	*Page*
1.	Preliminary Form for Application of Filter-Distance Model	51

SECTION 1
PROGRAM OVERVIEW

The post-World War II years have witnessed technological, political, and military developments of almost unprecedented scope. The vastly increased capability for mobility in combat has been more than matched by developments in weaponry. Scientific-military advances have been accompanied by shifts in the political-military scene. And although political considerations have never been separable from military determinations, their interrelatedness is firmer and more apparent today than ever before. The nature of conflict itself is changing; in the past few years emphasis has shifted to limited-war, Korea- or Vietnam-type politico-military engagements. Increased centralization and the growing demand for information and intelligence emanating from the higher levels of command have had a decided impact as has the total, rapid, and dramatic coverage of military operations by the press and mass media. Higher authorities are increasingly seeking more detailed and systematic information about the situation and status of lower command levels.

Sophisticated information-processing and communications systems have already been introduced into the Army and considerable pressure is constantly exerted for their more extensive employment. At the same time, however, some persons are questioning the expanded use of these costly and complex systems, and of other mechanical and electronic devices, without prior and methodical determination of the degree to which they satisfy the actual requirements of senior commanders. A major goal of this study is to establish a firm and rational basis for addressing these problems. The broad problem of developing and implementing automated systems is constantly reviewed by the Army itself. Detailed programs in progress, such as Automatic Data Systems for the Army in the Field (ADSAF) and Tactical

Operations System (TOS), are intended to examine requirements for, and capabilities of, information-processing systems to handle information and present it to human users.

The extensive combined effects of these scientific, military, and political developments on combat command must be analyzed and evaluated. Command principles, techniques, and requirements must first be identified if the compatibility of man with mechanical information and communications systems is to be understood. Another goal of this study is to identify these requirements and principles for use as the basis for future investigation and determination of how equipment, organization, and doctrine can be made to serve the needs of the commander in combat.

The ultimate objective, then, of the study of "Requirements of Senior Commanders for Command-Control Support," is to develop a basis for identifying and evaluating the impact and effectiveness of various technological, organizational, and personnel practices and techniques in statisfying present and future combat command-control support requirements of general officers. The three-phase program to accomplish this objective is outlined in Figure 1; this plan reflects the results of the phase-I effort.

PHASE I

The specific objectives of phase I of the study were to develop and test a methodology; to assemble a composite portrait of the commander in the command process; and to develop a preliminary model of command-control support requirements to be used as the basis for detailed study during phases II and III. To meet these objectives, three parallel lines of inquiry were followed: a questionnaire and interview program directed at general officers; historical studies; and an on-site study of the Seventh Army command process.

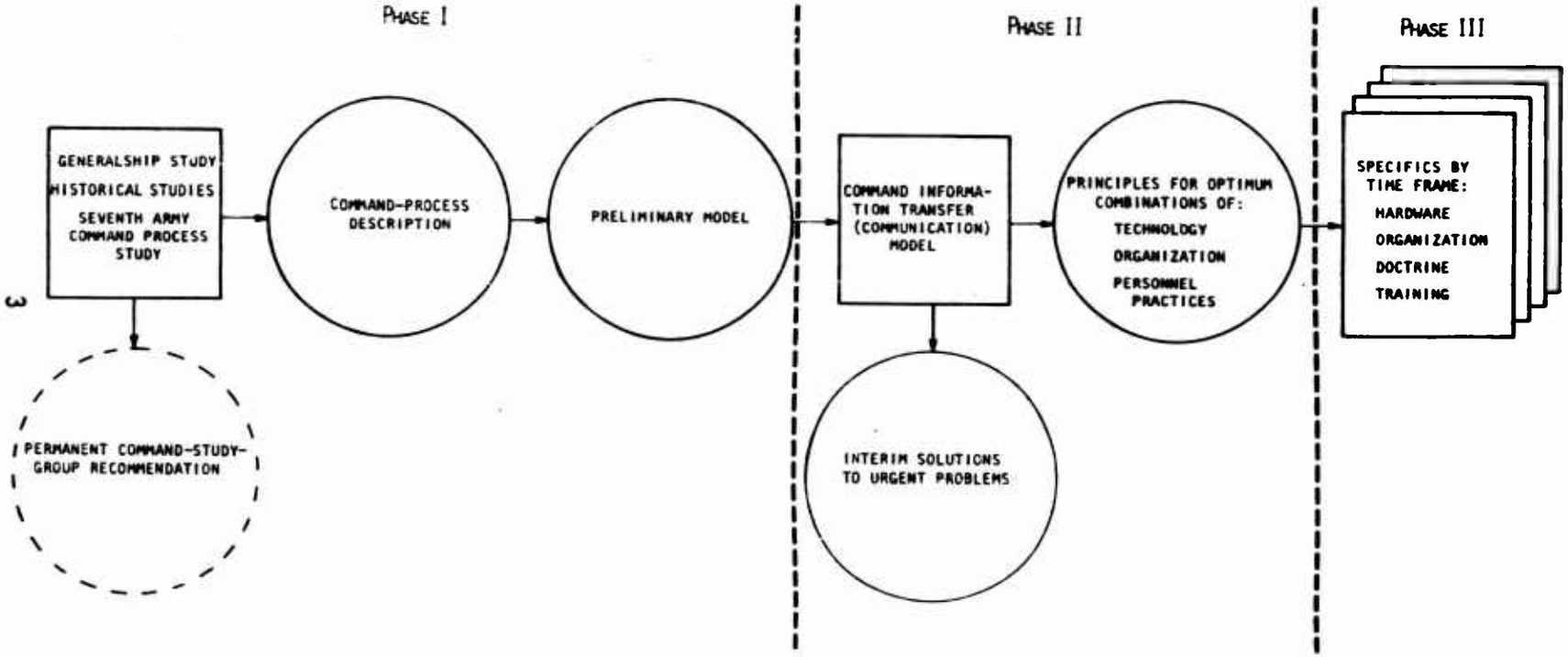

Figure 1. Block Diagram of Program Overview

The phase I study revealed the need for a permanent activity designed to provide for a continuing debriefing of active and retired general officers. General officers can profitably be called on to impart their extensive knowledge of command techniques, procedures, and practices gained through years of experience. Their insights into the command process should be systematically recorded for use by present and future generations of service officers. Data gathered from both active and retired officers can serve as the basis for systematic inquiry into the potential areas for change in support systems and, indeed, in all aspects of the command process. The debriefing could best be conducted by an Army agency with support by an independent research institute as required. The Army portion of the program should utilize general officers who would provide the necessary military expertise. Outside contractual support could be called on for broad interdisciplinary skills and the informality and objectivity necessary to elicit full and complete response. To locate this recommended study group at the Office of the Chief of Staff level would lend it and its work prestige and assure top-level command interest. On the other hand, to institutionalize such an activity in a major Army service school would provide a more detached and provocative atmosphere for professional discussion and debate. Further consideration of this problem is necessary.

The results of this study phase are summarized in the following sections of this volume, and are documented in detail in volumes II through IV.

PHASE II

During phase II, the precise nature of the interrelationships between the factors of the preliminary model, and possible changes in technology, organization, and personnel practices will be determined. As the model of command-information transfer is refined, principles for optimum combinations of these factors and practices will be identified.

The basic method of attack in phase II will be intensive, rather than the extensive method employed in phase I. Several specific combat situations will be identified (such as Korea and Vietnam), and a detailed inquiry will be made by questionnaire, interview, and examination of records of commander, staff, and subordinates to identify and assess the specific combinations of factors and techniques which seemed to be of value. These combinations will be used in examining and providing interim solutions to specific urgent problems.

In addition, information will be sought by expanding the phase I questionnaire-interview program to include additional active general officers and senior colonels so that these groups can be compared in detail. (Much of the raw data for these analyses have already been collected as part of the phase I effort.) With a sufficient number of situations and intergroup comparisons subjected to very detailed analysis, the general principles required by the model would become apparent.

PHASE III

The principal objective of phase III will be to translate the command-control support principles developed in phase II into sets of detailed recommendations for several specific time frames; these recommendations would encompass organization, doctrine, training, and hardware.

PRECEDING PAGE BLANK-NOT FILMED

SECTION 2

STUDY APPROACH AND METHODOLOGY

INTRODUCTION

The primary study concern is with the requirements of senior commanders; we have, accordingly, approached this problem from the perspective of the commander. We have analyzed the command process by studying the focal figure in that process — the Division, Corps, or Army commander. We have, furthermore, treated command broadly as an exercise in human interaction and interpersonal communication. It is our hypothesis that command-control information-communications systems must be designed from the top down; that is, the needs and requirements of commanders should dictate the nature of the mechanisms to be employed.

The currently popular "systems" approach to command-control was accordingly rejected by the FIRL staff as inconsistent with study objectives. For to speak of a command "system" is to ascribe to a highly individualistic activity a measure of formality and predictability which it does not, and by its very nature cannot, possess. Therefore, by "command process", we do not mean a rigorously structured or systematized set of actions and operations. Effective command is largely a process whereby men, machines, and materiel are manipulated by a skilled and experienced individual to achieve prescribed goals.

METHODOLOGY

Having decided upon this general approach to the problem, we next determined the specific methodology to be employed. As shown in Figure 2, preliminary investigations were therefore initiated: the relevant literature on both command-control and general organization theory was reviewed; and intensive interviews were conducted. In these investigations, we were especially interested in the available literature

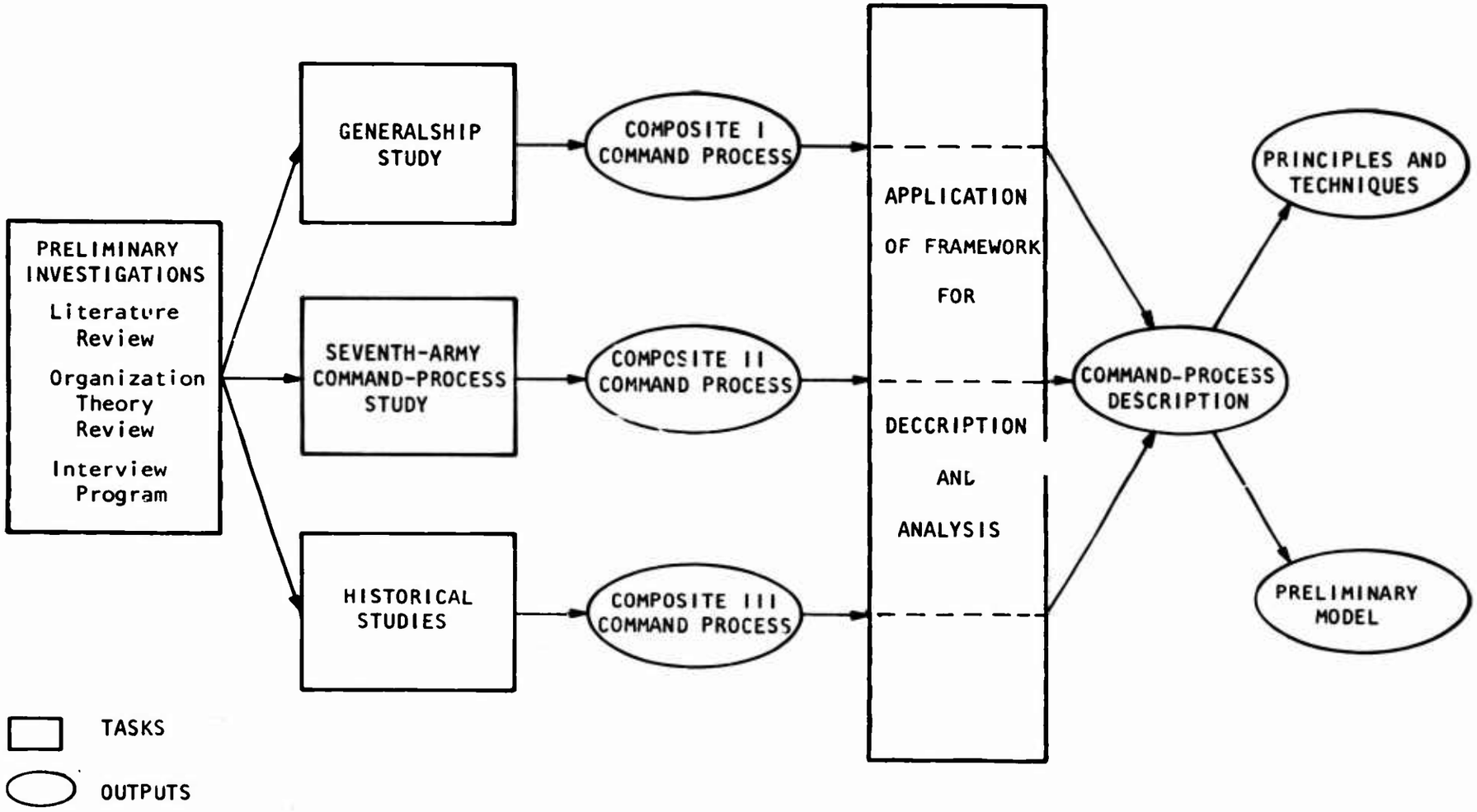

Figure 2. Block Diagram of Methodology

dealing with informal communications, crisis behavior, and top-level decision-making.

On the basis of these preliminary investigations, the decision was made to pursue separate, but parallel, lines of inquiry: a generalship study; historical studies; and a Seventh-Army command-process study.

It was anticipated that each of these parallel efforts would yield different results and would provide insights into different aspects of the command process; the completed studies confirmed the validity of this assumption.

Each type of inquiry has its disadvantages. Historical research suffers the obvious limitations of remote inquiry into the past; interviews reflect the bias of the interviewer; and, although questionnaires eliminate interviewer bias, they do not afford an opportunity for clarification, and analysis of responses is clearly subject to the interpretation of the analyzer. Despite these limitations, the combined results of the three lines of inquiry provided valuable insights into the complex process whereby highly skilled and experienced individuals achieve success in combat command.

A composite command-process description was then developed for each of the three studies. These were, in turn, merged into a single comprehensive command-process description by means of a general framework for description and analysis.

From this integrated command-process description, we extracted critical command principles and techniques and developed a preliminary command-control support-requirements "model". Future study phases will be directed towards identifying primary command-process requirements and variables and evaluating the relative effectiveness of alternative means (equipment, organization, and doctrine) for their satisfaction.

In the remainder of this section, the three lines of inquiry and the descriptive framework are described in greater detail.

Parallel Lines of Inquiry

Generalship Study

The first effort involved administering a "generalship" questionnaire to a large cross-section of senior commanders. This questionnaire, which was prepared jointly by the FIRL staff and a senior military project consultant, was pre-tested and then sent to 150 retired general officers, most of whom have had extensive command experience in combat; more than 80 responses were received.

On the basis of early replies, the questionnaire was revised, questions clarified, and new areas of inquiry introduced. The revised version was then pilot-tested on the student bodies of the Army War College and the Army Element of the National War College, and on a group of active general officers, including several who have served in Vietnam.

Questions were grouped into the following four categories, corresponding to stages in the command process:

1. Mission evaluation and interpretation,
2. Issuing of directives,
3. Monitoring of staff development of coordinated plans and orders, and
4. Follow-up and evaluation.

It was anticipated that this breakdown would provide us with a broad picture of how general officers establish, and then seek to satisfy, requirements throughout the various stages of combat command.

The results of this line of inquiry are contained in Volume II of this report, *Generalship Study*.

Historical Studies

The historical line of inquiry into the command process was conducted to determine patterns of command and control of several past

commanders. Commanders were selected for study partly on the basis of their reputations as superior commanders and partly on the availability of suitable historical materials about them. The objective of this portion of the study was to develop a historical composite portrait of the command process and of the methods, techniques, and procedures used by the commander in this process. The product of this inquiry is contained in Volume III of this report, *Historical Studies*.

Seventh-Army Study

The third line of inquiry consisted of a questionnaire-interview program, prepared by FIRL staff and consultants, administered to Seventh Army staffs and commanders. We sought to determine, through field research, current methods, techniques, and procedures of active Division, Corps, and Army commanders. One reason for selecting Seventh-Army, Europe was to balance anticipated future investigations based on an analysis of combat experiences in Vietnam.

The field research schedule provided for 1- to 2-hour interviews with Seventh Army commanders, and 3- to 4-hour sessions with each staff group. The objective was to gain an overall view and to determine, to the extent possible, common command patterns. The Seventh-Army inquiry pointed clearly to the validity of studying command techniques, procedures, and interactions in a total Army command context. A greater understanding of command requirements can be gained by examining the requirements of the various command echelons in such a total command framework, considering the command environment, the command hierarchy, constraints, and so on.

The results of the Seventh-Army inquiry are detailed in Volume IV of this report, *Seventh Army Command Process Study*.

A Framework for Description

To combine the composite command-process descriptions developed from each of three parallel studies, it was necessary to apply a framework for description; a simplified diagram of this framework is shown in Figure 3.

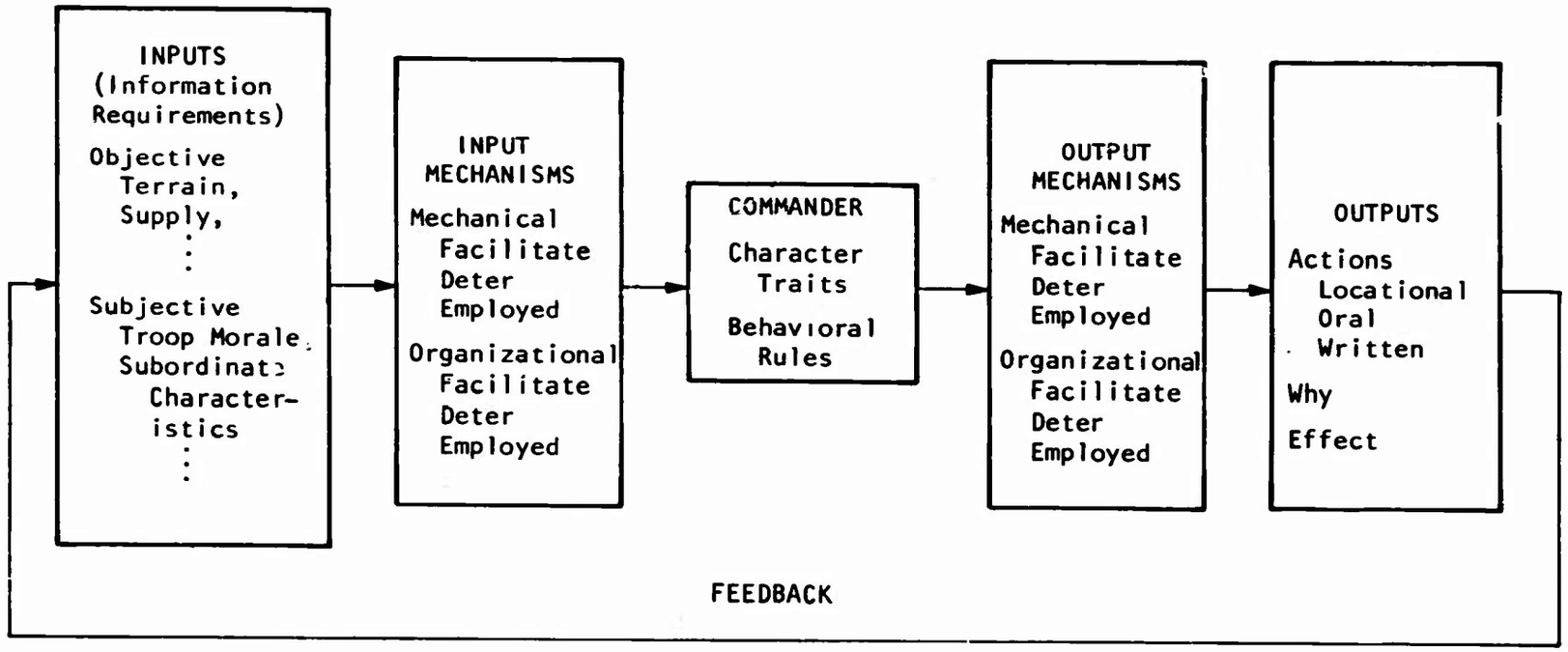

Figure 3. Framework for Description

As can be seen from Figure 3, the commander is the focal figure in the command process. The "inputs" consist of categories of information requirements; the "input mechanisms" are the mechanical or organizational means used to satisfy these requirements. The "outputs" consist, in effect, of the possible forms of what the commander does: oral, written, or locational (that is, actual movement from or to a given location); again, the "output mechanisms" are those organizational or mechanical tools employed to produce the various outputs.

The input or output mechanisms employed can either facilitate or deter; the desired goal, of course, is to assure that mechanisms facilitate rather than deter. In the description and analysis of the command process which follows, we also indicate that certain mechanisms are merely "employed" to imply that we have not determined whether these facilitate or deter.

Considerable filling-in of the descriptive framework depends on the availability of data which can only be secured in future study phases. Much of our work to date has been preliminary in nature; we have applied various tools in studying the command process and have developed a broad framework for analysis. On the basis of these efforts, we have reached certain tentative conclusions. We have, furthermore, been able to identify areas for future probing with a view to a detailed elaboration of the framework and of our command-process model. This, in turn, will make possible further, more refined, analysis of requirements, specific means for their optimum satisfaction, outputs, and effective mechanisms for their realization.

PRECEDING PAGE BLANK-NOT FILMED

SECTION 3
COMMAND-PROCESS DESCRIPTION

INTRODUCTION

In this section, the composite descriptions resulting from the general-officer-questionnaire, historical-research, and Seventh-Army studies, are integrated into a comprehensive description of the command process. The description is divided into the same four command stages used in the general-officer-questionnaire program:

1. Determine, isolate, and define the limits of the mission.
2. Turn the problem into an *operation* by issuing the commander's directive for conducting it.
3. With the assistance of the Chief of Staff, monitor the development, preparation, and issuing of coordinated instructions, plans, and orders for implementing the directive.
4. Follow up to see that instructions, plans, and orders are understood and implemented, making necessary modifications and additions as the operation progresses to completion.

This classification scheme facilitated analysis of both intial responses and overall study findings.

In the description, each command stage is presented in terms of the general framework of inputs, input mechanisms, output mechanisms, and outputs shown in Figure 3. This breakdown focuses attention on critical factors and, because each stage is described in the same terms, the requirements and mechanisms of different stages can be meaningfully compared. In future study phases, this descriptive scheme will facilitate analysis of tradeoffs to determine optimal command techniques for a given situation.

As presented in this section, the composite picture of each stage represents a broad consensus and constitutes only a brief outline of findings; Volumes II through IV of this report contain supporting detail.

Because several terms and phrases used in the description are subject to different interpretations, their meanings as assumed here are clarified as follows:

> *Art of Generalship.* The "art of generalship" (or of "command") is a phrase which serves to distinguish "generalship" from the more specific military disciplines and professions. It is the application of techniques for organizing and using subordinate commanders and staff in such a manner that the commander can best fulfill his responsibilities for directing, planning, and supervising operations. The practice of the art is through the channels of the command process.
>
> *Leadership.* Effective leadership, as distinguished from "generalship"*, is part of the art of command. It is a technique available to the commander to be applied with discretion.
>
> *Techniques of Command.* Techniques of command include a variety of mechanisms, tools, methods, and procedures employed by the commander in the exercise of his art; these will vary not only with individuals but with the different stages in the command process.

STAGE 1, MISSION EVALUATION AND INTERPRETATION

The mission is either assigned by a higher headquarters or is formulated on the basis of known policy, as dictated by the combat environment. For continuing operations, the commander may prepare contingency plans for presentation to, and approval by, a higher authority at the appropriate time.

Assignment of the mission immediately generates the requirement for numerous inputs—for evaluation, for additional information, and for systematic review of the existing situation or combat environment.

---

*In a lecture delivered at the Command and General Staff College, General Bruce C. Clarke, USA Ret. offered the following illustration of the difference between leadership and generalship:

> Suppose that you have a horse at "A" that you want to move to "B". You take hold of the halter shank and he follows you on down the road; you're the leader. But if you get on and ride him, you use different techniques... to accomplish your purpose and I would say that might be termed commandership... Now, if you are affluent enough to own a sulky and drive him with reins and with a whip, then that's generalship!

Successful execution of a mission requires that the commander analyze the mission, taking into account the means available to him and the submissions which will have to be assigned his major subordinate commanders. In addition, he must coordinate *his* assigned effort with the designated missions of any other units involved in the anticipated action.

The description of this command-process phase is diagrammed in Figure 4.

Inputs

The guidelines of the standard "Estimate of the Situation" suggest that three basic categories of information requirements must be met during the mission evaluation:*

1. Weather and terrain data,
2. Information about own troops and capabilities, and
3. Enemy information.

Although the commander may require other categories of information at this stage than the three identified above, and although each of these contains numerous other factors, these three are certainly the most important. Much of the information required under each of these categories will be on hand, or at least readily available. However, supplemental, up-to-date intelligence, and certain data which are not readily available, also will be required.

*Analysis of data collected for the present study reveals widespread agreement as to the value of the Estimate-of-the-Situation guide for identifying areas of critical information requirements. A commander relies, as he must, upon his staff and subordinate commanders for provision of much of the basic information necessary to planning; however, a large majority of general officers questioned stated categorically that the commander himself must evaluate all relevant information and develop his own estimate of the situation. Although the commander cannot possibly check the validity and/or accuracy of all the detailed data which he requires, he must assure himself that critical intelligence is current, accurate, and judiciously weighed.

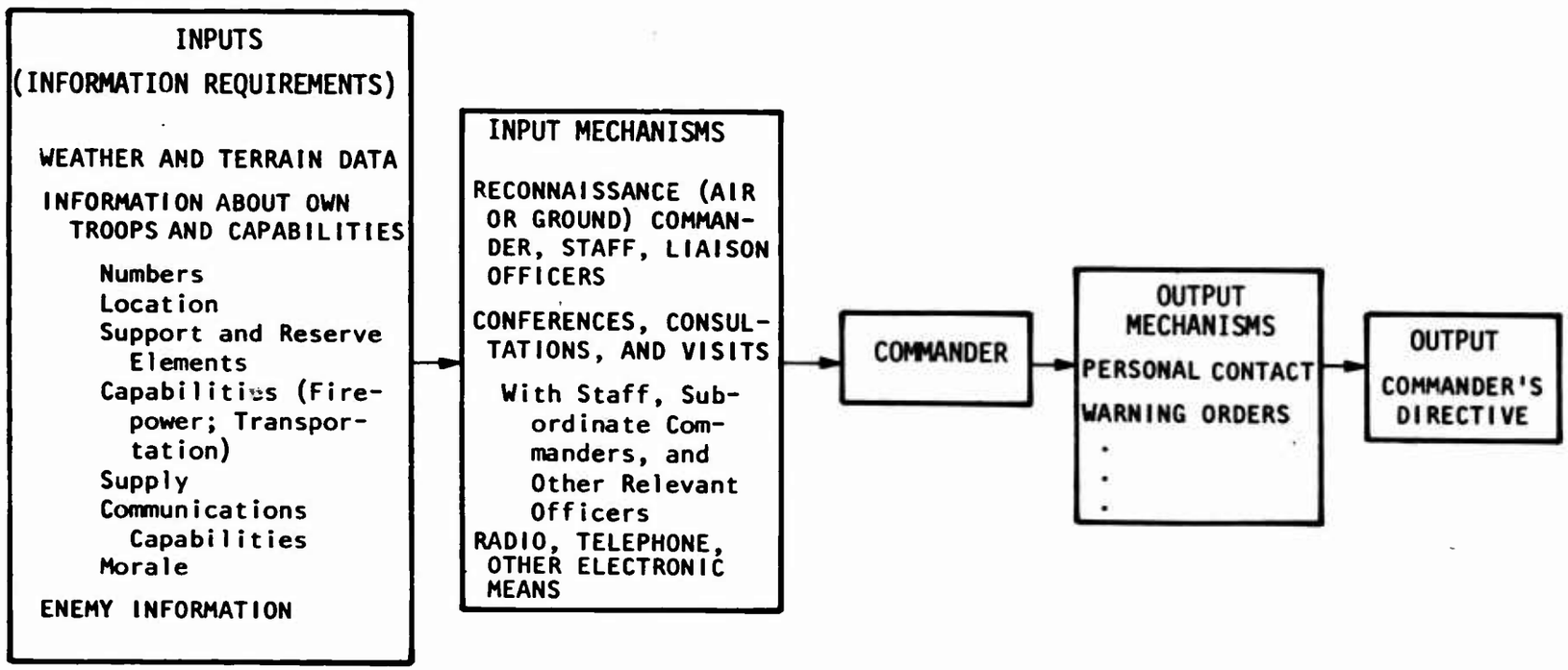

Figure 4. Stage 1, Mission Evaluation and Interpretation

Weather and Terrain Data

Weather information is of critical importance to the commander in evaluating his mission. It is also extremely difficult to obtain. The commander must not only take into account all available predictions, but must weigh the effect of sudden weather shifts on the likelihood for success of operations, the possibilities for implementing changes in plans, and the enemy's reactions.

Terrain information is equally important to the commander. However, he can acquire such information much more readily and check it with much greater accuracy than weather information. Knowledge of the terrain is essential to troop disposition, to maneuverability, to use of such vehicles as tanks, to the employment of supporting elements, and to the ease and speed with which reserve units can be brought into action. It is also a vital requirement in estimating enemy dispositions, maneuverability, reactions, and so on*.

Information about Own Troops and Capabilities

In evaluating information regarding his own troops, the commander is basically concerned with identifying areas of strength and weakness; such information is essential not only to his evaluation of the mission, but to all subsequent planning as well. In his planning, the commander must incorporate the design and the means for optimizing his strengths and offsetting his weaknesses. Should the evaluation of his own troops indicate that available forces cannot perform the assigned mission, the commander must seek modification of the mission from higher headquarters (or he must explain what additional resources are required, and why). In these circumstances, the commander would indicate that in his estimation (based on the current capabilities of his units), the success of

*In interviews with commanders who have served in Vietnam, the essentiality of this requirement for full knowledge of the terrain was repeatedly stressed. The effects of terrain on both the kinds of actions undertaken and the types of weapons systems which can be utilized were emphasized.

the conceived operation is, at best, dubious.* On the other hand, it is equally essential that a commander inform his higher headquarters of any estimates which suggest that the capabilities of his units are not only adequate to the assigned task, but might be sufficient to justify operations of greater scope.

The specific types of "own-troop" requirements include both factual and abstract, or intangible, information.

Essential to the commander's evaluation of his mission are the following data:

Numbers of troops and units available;

Precise location of units;

Availability of supporting and reserve elements;

Force capabilities, including firepower, mobility, and logistics; and

Communications.

Logistics and communications data are of utmost importance to the commander in this stage of the command process. The successful commander generally takes a strong personal interest in his logistics and communications systems, realizing that the adequacy or inadequacy of either may well determine the success or failure of operations.

Perhaps the most critical "intangible" which the commander must assess at this time is morale. The accurate assessment of morale is probably less a function of the intelligence or information-gathering system than of the receptiveness of the commander and his staff to indicators that must be *sensed*, rather than scientifically obtained. The morale of both the troops and his subordinate commanders will be heavily weighed by the commander in his evaluation of the assigned mission.

*Military history is, of course, replete with incidents where capabilities were estimated to be inadequate for the assigned task, but where the task was nonetheless assumed as assigned and completed successfully against all odds. The successful completion of a mission under such adverse conditions may be accounted for by brilliant tactical planning, by the impact of personal charisma, or by fortuitous and otherwise unaccountable "good luck".

Finally, the commander must acquire all available information regarding adjacent (or allied) commands as these affect his implementation of the assigned mission.

Enemy Information

The information requirements of special concern to the commander regarding enemy units are essentially the same as those discussed under the "own-troop" category. Enemy information includes location, strengths, capabilities, morale, recent activities, and probable reactions to the planned action.

The tendency towards increased centralization, and the vertical control of intelligence systems, complicate the commander's task of obtaining enemy intelligence.

Input Mechanisms

The information requirements for this command-process stage are satisfied through application of a variety of techniques and "mechanisms". Although the specific means employed vary according to the practices and preferences of the *individual* commander, these mechanisms can be divided into two basic categories: reconnaissance; and conferences and consultations, including visits to subordinate units and their commanders. The available time is critical, of course, in setting the limits of use of any mechanism.

Reconnaissance

Whether it is performed personally by the commander, or by staff or other liaison officers, reconnaissance is one of the most direct mechanisms for gathering information.* Even where accurate maps and displays are available, personal reconnaissance supplies the commander with the appreciation of terrain which is so essential to evaluating the mission. This personal reconnaissance of the battle area will strongly influence subsequent development of the scheme of maneuver, the disposition of troops,

*Reconnaissance of the battle area by key staff personnel is valuable and can serve as an extension of the commander's personal reconnaissance. Time permitting, reconnaissance prepares staff officers for their role in detailing operational plans and orders. It also enables the staff to gather, and then to pass on to the commander, the accurate and up-to-date information that he requires.

the employment of reserves, and so on. It further enables the commander to make more informed estimates concerning possible and probable enemy movements and reactions, and to prepare to meet and deal with these. When time permits, the commander's personal reconnaissance is thus a highly useful information-gathering mechanism.

The helicopter has made personal reconnaissance more practicable than ever before. As a reconnaissance vehicle, it reduces the time required to survey the battle area, and makes it possible for the commander to cover much ground, to overfly zones impenetrable by jeep or truck, and to gain an "overview" of the terrain which would be impossible to achieve on the ground. There are advantages to driving over or walking across the battle area (and some active Vietnam commanders have stated that these are critical). However, the ability of the helicopter to hover and to fly the contours of the area, in large part offsets the disadvantages of air—as compared with ground—reconnaissance. Because of these and other capabilities, the helicopter has become a most valuable command tool—not only for personal reconnaissance, but for many other command and control functions.*

Conferences and Consultations

The mechanisms of conferences, consultations, and visits are employed by the commander to acquire the information necessary to mission evaluation directly from experts; to discuss a wide range of views and recommendations prior to his formulation of the directive; and to have those persons who will carry out the mission participate at an early stage.

In addition, conferences, consultations, and visits may affect morale. Persons with whom the commander confers are made to feel that he considers their advice to be important, that he views them as "part of the team". Most commanders agree that half the job has been done when acceptance of assigned tasks has been secured *before* orders are issued, and that these mechanisms assure such acceptance and help to prevent misunderstanding of what is expected. Questions and objections can thus be aired in this preplanning stage. Although information can

*The value of the helicopter is obvious. However, the helicopter - like any other communications device - can be overemployed to the point of harassing subordinate commanders. The wise commander will regulate his own and his staff's use of this tool.

be collected and disseminated by telephone, radio, and other electronic means, face-to-face contact remains the preferred technique.

The effect of introducing such mechanisms as television and videophones will have to be evaluated. A new generation of officers is now being conditioned by education and experience to accept and use real-time, audiovisual or multisensory communications devices. For example, computer and television centers currently are in use at the USMA. Evaluations of such developments could be incorporated into an institutionalized Army debriefing program.

Conferences and consultations can satisfy requirements in all three of the information categories discussed earlier. *Whom* the commander will consult with*, and *where* he will hold his command conferences, will depend on the overall situation and, more specifically, on the time available to him.

Assuming that time and conditions permit, the commander will assemble appropriate members of his staff and his major subordinate commanders to discuss with them the assigned mission. In many instances, the impending operation will already have been reviewed with several of the assembled persons as a byproduct of prior planning. However, in a military engagement of the Vietnam type, or in a defensive situation where actions and reactions are sudden and violent, preplanning may well be inadequate and the process of consultation—while subjected to considerable compression—becomes an even more essential command mechanism.

Should the situation be such that the commander cannot assemble his subordinates in his Command Post (CP), he will visit them at their own CPs. He looks to his major subordinates for their personal evaluations of the situation and of their own units, discussing with them any problems or questions they might have. Such visits are of inestimable value to the commander because they make it possible for him to check and cross-check the data he already has, and to fill many information gaps. By visiting subordinate commanders at this time, the commander, in his role of sensor, can acquire a feel for the situation which staff reports alone cannot provide him.

*The participants in the command conference will vary greatly; for example, the artillery commander, the chaplain, the signal officer, and the surgeon may be called upon for advice.

Output and Output Mechanisms

The information requirements having been established, and the mechanisms for their satisfaction brought into play, the commander—in the role of decision-maker—takes over. He is now responsible for assessing and evaluating all of the available data to determine whether the means at hand are adequate to the task. At this point in time, the mission has been reduced to its essentials: the who, what, where, when, why of the mission have been isolated.

The output in this command-process stage is the commander's directive. The commander formulates and issues the directive according to several time-proven and generally agreed upon command principles and effective techniques and mechanisms; he also avoids certain practices. These are listed briefly below.

Command Principles

Command principles include the following:

Time. Always keep time in mind; it is the single most important factor.

Precision. Ensure precision—but without sacrificing thoroughness.

Understanding. Ensure total understanding by staff and subordinate commanders.

Mission analysis. Analyze the mission as rapidly as possible to permit both staff and subordinate commanders the maximum amount of time in which to prepare for operations. However, make the analysis thorough enough to develop fully the requirements and capabilities of the command for carrying out the mission.

Prior planning. Prior planning and contingency planning are critical to the success of the mission.

Techniques and Mechanisms

The effective techniques and mechanisms include

Personal contact with staff and subordinate commanders; and

Use of warning orders to alert subordinate commanders*.

*The various study inputs emphasized the desirability and necessity of issuing warning orders at this stage in the command process. Respondents to the questionnaires and persons interviewed agreed that warning orders should be issued to subordinate commanders as soon as the concept of

Practices to Avoid

Techniques and practices detrimental at this stage include

Verbosity, overcomplication, and redundancy;

Dogmatic or premature decision-making (failure to assess the situation and acquire needed information); and

Failure of the commander to use his staff and consult with his subordinate commanders (trying to do everything himself).

STAGE 2, ISSUING OF DIRECTIVE

Once the commander has evaluated and interpreted the mission, he turns the problem into an operation by issuing his directive for its conduct. The process by which he issues this directive constitutes stage 2.

The description of this stage is diagrammed in Figure 5.

Inputs

In this second stage of the command process, the primary input is the output of stage 1—the commander's directive conceived and formulated on the basis of the interplay of persons and repeated exhcanges of information.

The commander's directive embodies his decisions regarding the ways and means for carrying out the mission assigned his command. Although the directive generally is concise, it will cover most of the "essentials".

The commander's statement of the mission, his overall concept of operations, major task assignments, designation of support units, logistics, and communications are among those points which will be

---

the mission is sufficiently clear to the commander and his staff to permit their meaningful formulation. Warning orders need not be detailed; however, the sooner such orders are issued, the more thorough and complete will be the subordinate commander's planning and preparation for execution and operations. Again, in view of the pressures of time, warning orders are frequently transmitted by message. However, the commander will generally discuss his tentative concept of the operation, and the implications of the warning order, with the subordinate commander as soon as possible.

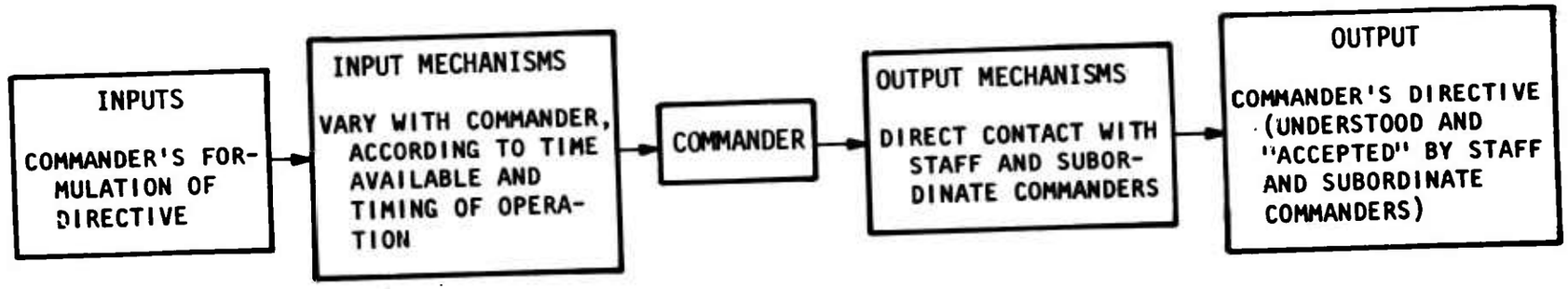

Figure 5. Stage 2, Issuing of Directives

covered, however briefly, in the directive. Failure to cover any of these points will seriously degrade all subsequent detailing of plans and orders.

Input Mechanisms

As noted in the discussion of input mechanisms for stage 1, specific techniques and practices will vary according to the style and preferences of the individual commander. Two additional variables will, however, significantly influence the actual techniques employed: the *time* available for planning, and the *timing* of the operation.

How

Ideally, the directive will be complete, in written form, and issued all at once. However, given the pressures of the combat environment, this ideal manner of issuance may not be possible. Although the issuing of the directive all at once is commonly preferred, it is sometimes necessary, or desirable, to issue it in fragmentary form. By issuing his directive in fragmentary form when under pressure of time, the commander provides both his staff and the staffs of subordinate commanders with early information essential to their respective planning activities.

Directives are most frequently issued orally, but confirmed as soon as possible in writing. The determining factor, again, is available time. Directives for major operations will usually be issued formally and in writing when time is not critical, and when prior planning makes this possible. In general, the higher the headquarters, the greater the likelihood that directives will be written.

To Whom

The commander most commonly issues his directive jointly to the chief of staff, representatives of general and special staff sections,

and major subordinate unit commanders.* By issuing the directive to staff and subordinate commanders simultaneously, all persons involved in planning and executing operations are present at one time and the staff is available to answer questions posed by subordinate commanders. In addition, lead time available to both groups for planning and preparation is increased.

Output and Output Mechanisms

The output of stage 2 in the command process is a directive understood and "accepted" by both staff and subordinate commanders—"accepted" is used here in the sense that objections have been aired and discussed, and clarification sought and given.

Face-to-face contact with staff and subordinates is the preferred mechanism for securing both acceptance and understanding of the commander's directive. If time and conditions permit, the commander will, as stated previously, issue his directive jointly to staff and subordinates. By providing this opportunity to pose questions, state objections, clarify and guide, coordination of effort is assured, misunderstanding avoided, and the effectiveness of subsequent planning and of the execution of orders are enhanced.

The general principles to be followed by the commander in the issuing of his directive, include the following:

> Observe simplicity, conciseness, and clarity in the formulation of the directive.
>
> Assure full understanding of the directive.
>
> Take advantage of every opportunity to secure acceptance.
>
> Establish schedules which allow staff and subordinate commanders the maximum amount of time to plan and prepare for operations.

*This statement is based upon analysis of questionnaire responses and interviews which indicate that this is not only the most common, but the preferred, manner of issuance. However, several respondents indicated that it was their custom to issue the directive to the chief of staff alone, or to the chief of staff and general staff officers together, with special staff sections, subordinate commanders, and higher headquarters receiving copies. Respondents and interviewees tended to interpret the term "directive" as being synonymous with "orders" and not "staff guidance"; this broader interpretation is reflected in this description.

The effective mechanisms and practices include

Direct contact with subordinate commanders; and

Talks with, and visits to, staff officers to assure their full understanding and acceptance.

Among the practices to be avoided during this stage, the most important are

A commander's isolating himself from his staff and subordinate commanders once the directive has been issued;

Excessive detail in the directive (the directive should not spell out the "How" of implementation; staff and subordinate commanders must be permitted to do their own jobs); and

Oversupervision.

The more specifically "military" practices to be avoided have deliberately been omitted. Discussion of such standard concepts as "avoid designation of special task forces without insuring adequate support" does not fall within the prescribed limits of the present study.

STAGE 3, MONITOR DEVELOPMENT, PREPARATION, AND ISSUANCE OF COORDINATED PLANS AND ORDERS

In the first phases of this stage, the primary actors are the chief of staff and other staff officers. In the output phases, the commander once again is the key figure. However, while the commander may delegate primary *authority* for the monitoring function to his chief of staff, he cannot delegate his own *responsibility* for this or any other critical command function.

The description of this stage is diagrammed in Figure 6.

Input

The input at this stage is the fully discussed, understood, and accepted commander's directive.

Input Mechanisms

In the first phases of stage 3, the commander generally will not monitor plan development and order preparation directly. The chief of

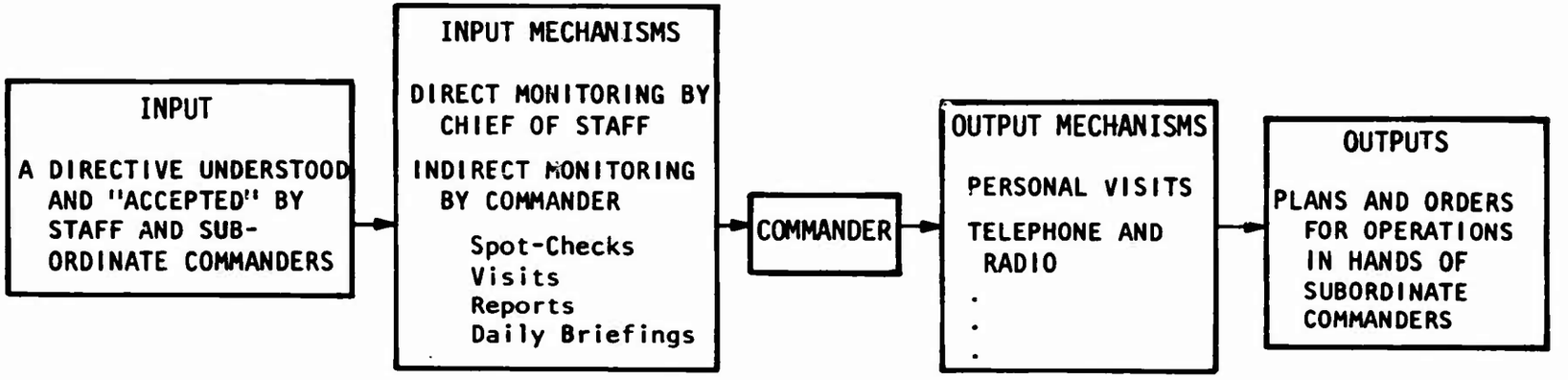

Figure 6. Stage 3, Monitoring of Staff

staff, in his role of immediate staff monitor, will supervise these staff activities closely and continuously; he is also responsible for assuring complete coordination of the various staff inputs.

During this phase, the chief of staff serves as a link between the commander and the staff. The staff works for, and is directly responsible to, the chief of staff; the commander looks to his chief of staff to apprise him of all developments, inform him of the progress of planning, and notify him whenever his personal intervention, guidance, or advice is required. The commander thus generally monitors *through* his chief of staff.

Although he seldom intervenes directly, the commander will be available for advice and guidance. Questions and problems requiring his resolution will almost invariably arise during the early phases of staff planning, and the commander may be called upon to change or modify previously made decisions or to clarify any ambiguous points. His personal availability is thus largely a preventive measure to offset the "wheel-spinning" which could result from his not being present to advise and guide; and to ensure timely staff action. The commander must also spot-check and visit the various staff sections to satisfy himself that the task is being performed according to schedule. However, the commander must intuitively sense the difference between occasional checks and complete involvement in every staff planning and monitoring detail. He cannot be everywhere, do everything, or check everything himself and must rely on his chief for staff supervision.

The chief of staff and all staff personnel must be made to appreciate the value of the commander's presence or availability; the channel of direct access to the commander must be maintained. Although staff officers should have direct access to the commander at this time, they will generally find it possible to work through the chief of staff. In any case, the chief of staff should be informed of any direct contacts between his staff and the commander.

The generally accepted rules and command principles applicable to this phase are, in summary

Be available.

Rely on your chief of staff for direct monitoring of staff activities, but be available for advice and guidance when it is required.

Make spot-checks to ensure timely staff action.

The mechanisms and techniques available to the commander for indirect monitoring include

Conversations with the chief of staff,

Staff reports at daily briefings,

Informal contacts and conversations,

Spot checks, and

Progress reports.

At this stage, the primary practice to avoid is oversupervision.

Output Mechanisms

Although it is desirable that he be available during the initial phases of detailed staff planning and preparation of orders, the commander will generally leave his CP as soon as practicable to visit subordinate unit commanders. He will rely on his chief of staff to inform him of problems and progress while he is in the field. He is guided in his decisions as to when to leave the CP and where to visit by the requirement that vital information and plans reach the subordinate commanders as soon as possible. The subordinate commander needs as much time as possible for his own planning; all time lost during this phase will detract from the effective execution of the mission.

Once orders and plans have been detailed (and generally long before they are issued in complete form), the commander must ensure that these reach—and are fully understood by—his subordinate commanders.

Despite the availability of various communications mechanisms for contacting subordinate commanders, analysis of all study inputs has

clearly established that direct, face-to-face confrontation is overwhelmingly preferred by contemporary commanders during this phase over contact by telephone or radio. The decision to select face-to-face contact or electronic communications as the mechanism will depend largely on the criticality of the problem or question to be discussed. And, although staff and liaison officers sometimes deliver and explain plans and orders, the consensus is that such transmittal is less effective than, and therefore a less desirable alternative to, the commander's own, personal visits.

Personal visits are the best possible mechanism available to a commander to ensure that orders are thoroughly understood. By establishing direct contact at this time, the commander gains insight into any problems or questions which his subordinate commanders might have; visits provide the opportunity for their prompt resolution.

Just as orders must not detail the "how" of implementation, so must the commander assiduously avoid oversupervision or undue interference. For example, respondents uniformly extolled the virtues of the helicopter as a means of reducing the travel time required for a commander's visits to subordinate units. Most noted, however, that the availability of the helicopter should not prompt the commander to make more frequent visits which might promote oversupervision. The attitude to be maintained during these visits is one of offering assistance to the subordinate when and where he requires and seeks such guidance. Finally, the commander—as sensor—can gain an appreciation of the situation, of the requirements, and of the "morale" of his subordinates by means of these visits—which reports and radio contacts generally cannot convey to him.

In summary, the practices to be avoided during this stage are

Oversupervision;

Meddling in the details of plan and order preparation (harassment of the staff); and

Overdetailing the "how" in orders to subordinate commanders.

Outputs

The outputs in this stage are the plans and orders for operations delivered to the subordinate commanders responsible for their implementation and execution.

STAGE 4, FOLLOW-UP AND EVALUATION DURING OPERATIONS

The initial stages of any large-scale military operation are always especially critical: timing, the requirement for coordination, failure of support to materialize, traffic jams, enemy actions, and temporary setbacks, combine to create an exceedingly tense situation in which control is tenuous. The commander's most critical requirement during this stage is for information.

The descriptive phases in this stage are diagrammed in Figure 7.

Inputs

The initial inputs for this fourth stage in the command process are the operational orders and plans issued and delivered (the outputs of stage 3). As was the case in stage 1 (Mission Evaluation and Interpretation), this input, and the initiation of operations, immediately generate additional input requirements for evaluation, information, and systematic review of the overall situation.

The categories of information that a commander requires in this stage are essentially those of the first stage in the command process, as expanded to reflect the impact of ongoing operations:

Weather and terrain data,
Information concerning own troops and capabilities,
Enemy information, and
Information concerning the overall situation.

However, although the categories of required information are similar to those of stage 1, the specific types of information within these categories are largely peculiar to this fourth stage. During this stage,

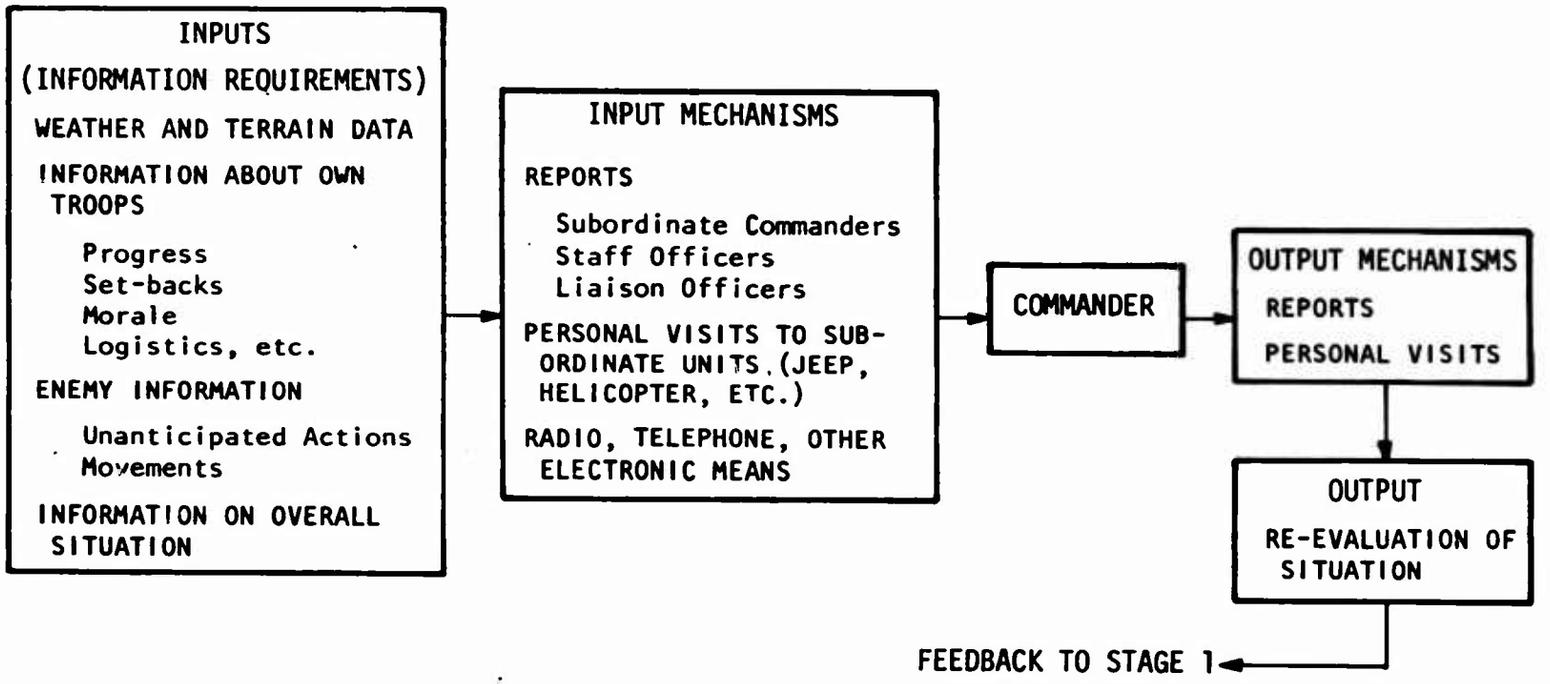

Figure 7. Stage 4, Follow-Up and Evaluation

the commander must have timely progress reports on all aspects of the operation: bottlenecks, headway or setbacks of each unit, casualties each unit has sustained, morale of his troops and commanders, the status of logistics support, unanticipated enemy actions—everything that affects the combat effectiveness of his command.

Input and Output Mechanisms

Although the information requirements for stages 1 and 4 are roughly comparable, time is even more critical at this stage than it was in the first stage. The commander requires information quickly if successes are to be exploited, plans revised, corrective measures undertaken, and reserves brought in. This requirement for rapid, accurate, complete information greatly determines the mechanisms and/or techniques used to secure its provision.

Initially, the commander will have received reports from subordinate-unit commanders and, possibly, from staff or liaison officers in the field. However, this stage requires the greatest amount of the commander's personal activity and he will, as soon as practicable, leave his CP to visit subordinate units and to reconnoiter the combat area. The pressures of ongoing operations transform the conference/consultation mechanisms employed in stage 1 into repeated personal trips in stage 4.

The commander will continue to rely, in part, on radio and telephone contacts, liaison officers, visits by staff officers, and reports as follow-up mechanisms and information-gathering techniques. At this stage, the chief of staff commonly is assigned responsibility to inform the commander of developments made known to him—to assure that while the commander may be on field visits, he will be kept apprised of the overall situation. However, respondents and interviewees contacted during the present study phase consistently referred to the need for the commander himself to visit vital areas and units involved in critical actions. Accordingly, the commander will assume personally as much of the follow-up responsibility as time, distance, and other demands upon him will permit.

The actual positioning of the CP may seriously affect the time available to the commander for visits and reconnaissance. The division, and generally the corps, CP will therefore most often be located well forward. Increased future use of the airborne CP as a command mechanism is likely; this mechanism is currently being employed in Vietnam.

Despite the revolutionary advances in communications technology since World War II, and despite the fact that use of radio and telephone is increasing, the emphasis on personal contact has not diminished. General officers who have served in Korea and/or Vietnam are no less adamant on this point than World War II commanders. Face-to-face contact with subordinate commanders engaged in action, especially when "the going is rough" for their units, is thus a basic imperative of command. Personal visits, constant evaluation, checking and double-checking, are all critical to the commander in his attempting to confirm the accuracy of information conveyed to him. In addition, the impact of a commander's visits on the troops of a unit engaged in battle is often dramatic: they may eliminate confusion, restore order and calm, provide the impetus necessary for an advance, and comfort and encourage tired and beleaguered troops.

The successful commander will generally manage to be at the critical place, at the critical time. He achieves this by

1. Always keeping abreast of the developing situation by continuous and total preoccupation with the course of events;
2. Frequent field visits to major subordinate commanders, intense study of the terrain by map and by personal ground or air reconnaissance;
3. Careful study and evaluation of all available intelligence;
4. Pre-operation estimates of which actions will be most critical to overall mission success;
5. Knowledge of the strengths and weaknesses of his subordinate commanders;
6. A feel for the situation which may, at times, supersede all other factors; and
7. Intuition, experience, and luck!

In addition to visiting critical action points, the commander frequently seeks to maintain contact with subordinate echelons two levels below his own. However, no general and accepted organizational rule exists for determining precisely which units to visit.

The specific modes of transportation employed by the commander vary, of course: jeep, tank, truck, and helicopter are among the vehicles most commonly used.

All studies and analyses conducted indicate that senior officers consider visits to be important; few such officers claimed to have normally spent more than 4 daylight hours in their CPs during this stage. However, analysis also reveals that commanders uniformly declare the necessity for maintaining continuous contact with their CPs, and stress the requirement for staying "on top of the overall situation". Itineraries will, therefore, normally be supplied the chief of staff before a commander leaves his CP for visits to the front; reports of changes in the itinerary, frequent checks into the CP by radio, telephone, or messenger are common means of informing the chief of staff and the commander's own headquarters of the current situation. Through such constant communication, the commander is also kept informed, and thus he remains in firm control.

The interchange of information through communications is supplemented by daily briefing sessions. The commander will also frequently "debrief" himself, either orally or in written memoranda, on his return to the CP. (The commander is generally accompanied by an aide or staff officer on his visits to combat units. He employs his aide to record and transmit information, and to keep a record of any orders issued while in the field.)

Subordinate commanders inform the commander of events and developments not only during his visits to their units, but by personal telephone calls, radio, or by dispatching an aide or staff officer. The subordinate commander will only rarely leave his unit during operations to report to his next higher headquarters.

The command principles relevant to this stage include

React promptly.

Maintain flexibility.

Think ahead (develop contingency plans).

Exploit successes.

Maintain contact with staff and subordinates.

The more effective techniques or practices are

Visits;

Personal reconnaissance;

Availability for advice and guidance;

The giving of praise where due;

Display of confidence in subordinate commanders; and

Maintenance of up-to-date information on logistics and communications, and on the progress of the battle.

Techniques and practices to be avoided include

Hasty decisions and changes in plans;

Loss of contact with the CP, subordinates, or higher headquarters;

Rigidity in thinking and in practice;

Attempting to dictate the how of implementation (intervening unnecessarily in a subordinate's job);

Locating the CP too far to the rear;

Attempting to follow up and generally conduct an operation from the CP; and

Disciplining subordinates in the presence of others*.

Output

The output in stage 4 is re-evaluation of the situation; it provides an obvious feedback into command stage 1. The command

*Subordinates should be censured in such a way as to minimize the embarrassment to the individual or his staff. The senior commander must give considerable thought to replacing or relieving subordinate commanders or staff officers. Once the decision is made that relief of an officer is, indeed, called for, it should always be done in such a manner that the effectiveness of his unit and staff is not further damaged, and the future usefulness of the individual himself is not endangered.

process is continuous and iterative: actions, requirements, satisfaction of requirements, constantly generate new requirements and precipitate other actions and developments.

CONCLUSION

From this description of the command process, it is evident that critical requirements and effective means for their satisfaction vary with the different stages in that process. It is also evident that the variety of mechanisms for satisfying requirements and facilitating processes at any stage need to be examined to evaluate their relative effectiveness; the following section is addressed to this problem.

SECTION 4
PRELIMINARY MODEL FOR EVALUATING EFFECTIVENESS OF INFORMATION-TRANSFER MECHANISMS

INTRODUCTION

A commander requires a tremendous volume of information; and current needs and practices tend to increase his requirements. Thus, it is highly desirable that some method of facilitating the flow of information, and of selecting the optimum mechanisms to satisfy information requirements be provided; in particular, the commander's face-to-face personal contact with subordinates and staff must be supplemented with other techniques of acquiring and disseminating information. This section describes the development of such a method.

The composite command-process description presented in the preceding section has revealed several underlying postulates which indicate that command can be viewed as an information-transfer process. This section first lists these postulates and then describes the command process in information transfer terms.

In viewing command as a process of information transfer, the critical factors in that process are first isolated; then it becomes possible to suggest areas where partial substitutes can appropriately be introduced into the system. Categories of techniques and mechanisms for optimizing information flow are then identified, and the format of a model for their evaluation outlined. A means for determining and assigning values to the various possible techniques remains to be devised; this will make it possible to employ the model to evaluate the effectiveness of these techniques.

UNDERLYING POSTULATES

On the basis of the investigations and analyses performed under this study, several underlying postulates derive directly from the findings:

Personal contact is essential. Historical research has revealed that past commanders considered face-to-face personal contact with their subordinate commanders and with their staffs to be an essential part of the command process. On the basis of both questionnaires and interviews, it is evident that present-day commanders (Korea through Vietnam) continue to claim that such personal contacts are critical. Communications technology has certainly improved in recent years, and Vietnam commanders, for example, are increasingly using radio, telephone, and other command communications devices; but despite improvements and despite increased use, they continue to consider personal contact to be vital.

The commander requires both objective and subjective information. The research conducted into both past and present techniques of command revealed that the commander's information requirements range from such objective statistics as numbers of unit casualties, to such subjective factors as troop morale. Although a commander's requirements for information will obviously reflect the specific situation and cannot, therefore, be generally specified, various categories of requirements can be identified.

Information must flow both to and from the commander. The commander must be informed and must inform; he must "sense" and convey attitudes and moods.

Mechanical communications and information systems supplement human mechanisms for gathering and disseminating information, but cannot replace them. Massive effort and funds have been expended to develop automatic-data-processing (ADP) systems during the past decade. Such systems can supplement human mechanisms, but obviously cannot perform many of the functions critical to the information-flow problem. With the present state-of-the-art of ADP, these systems cannot solve tactical problems, make command decisions, or process subjective or even quasisubjective data. ADP systems can, however, provide command data banks to serve as commander and staff tools. The Seventh-Army Tactical Operations System Project (TOS) is representative of the many ongoing Army projects devoted to adapting modern information-processing technology to the requirements of commander and staff.

The type and level of detail of required information vary. The once-popular notion that the higher an individual is in a hierarchy of management or command, the less detail he requires, has been negated by the recent tendency towards increased centralization. High-level commanders in Vietnam, for example, are increasingly concerning themselves with the operational details of relatively small units; it is not unusual for a theatre commander to seek information regarding battalion activities or to attempt to convey information—generally subjective—to a battalion commander. Press and mass-media coverage of Vietnam military operations further prompts senior commanders to seek details of relatively small-unit activities.

The organization of required information varies primarily with the commander, and with the situation. For example, division commander X may view logistics as the key factor, while division commander Y may consider morale to be over-riding. Differences in perspective, personality, preferences, and techniques will clearly affect the types of information each seeks and, consequently, the way in which that information will have to be organized.

COMMAND AS AN INFORMATION-TRANSFER PROCESS

On the basis of the underlying postulates summarized in the Introduction to this section, the command process can be viewed as one in which required objective and subjective information is transferred or communicated to and from the commander. Figure 8 is a representation of such a system in its simplest form.

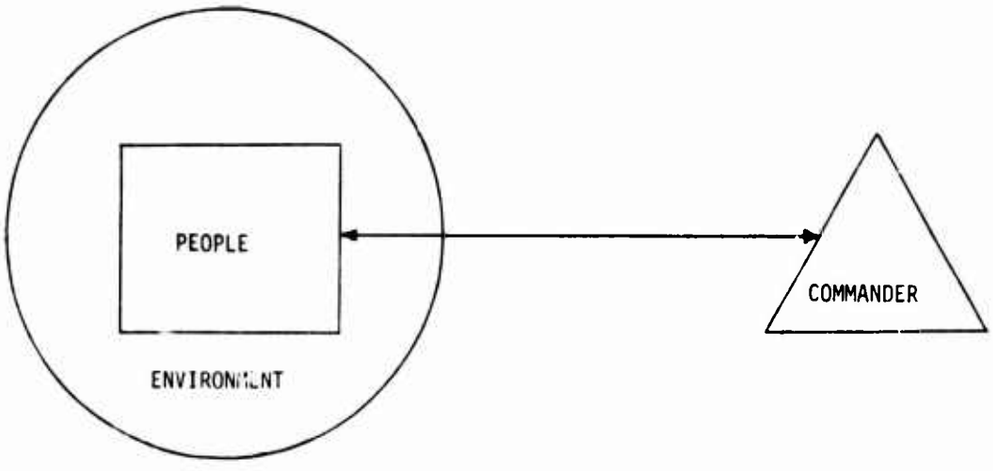

Figure 8. Basic Information-Flow System

From subordinate units the commander receives information about them and their environment; he also transmits information to them. Ideally, information flows directly to and from the commander. In such a case, the commander would be present at the site of the action. However, in practice, because the commander commands many units which are generally scattered over a fairly extensive area, his constant physical presence is impossible. Accordingly, the diagram must be expanded to reflect the persons and mechanisms through which information must flow.

As shown in Figure 9, an "other person" (generally the subordinate unit commander) and a technological communication system (radio net, telephone, or teletype) are interposed between the unit and the commander. The commander now "sees" the unit and its environment, and is "seen" by the unit, indirectly. Direct contact (physical presence) is limited; the commander selectively visits units under his command but cannot remain with one unit at all times.

This overall system can be termed the Command-Control Support System (CCSS). Since the CCSS must transmit subjective information in such a manner as would substitute for the commander's physical presence, three measures of effectiveness are suggested: delay, error, and loading.

The usefulness of two of these measures has already been demonstrated in connection with technological communication systems which transmit concrete, defined messages:

$$\text{delay} = \text{time}_{out} - \text{time}_{in}$$

and

$$\text{error} = \text{message}_{out} - \text{message}_{in}$$

For information flowing *to* the commander in the CCSS, these measures can be defined as follows:

$$\text{delay} = \text{time}_{\text{receipt by commander}} - \text{time}_{\text{happening}}$$

and

$$\text{error} = \text{information}_{\text{as commander would have seen}} - \text{information}_{\text{received by commander}}$$

Note that this definition implies that the subjective information, which constitutes the core of the problem, cannot be measured objectively, but only in terms of what the commander would have seen had he been there.

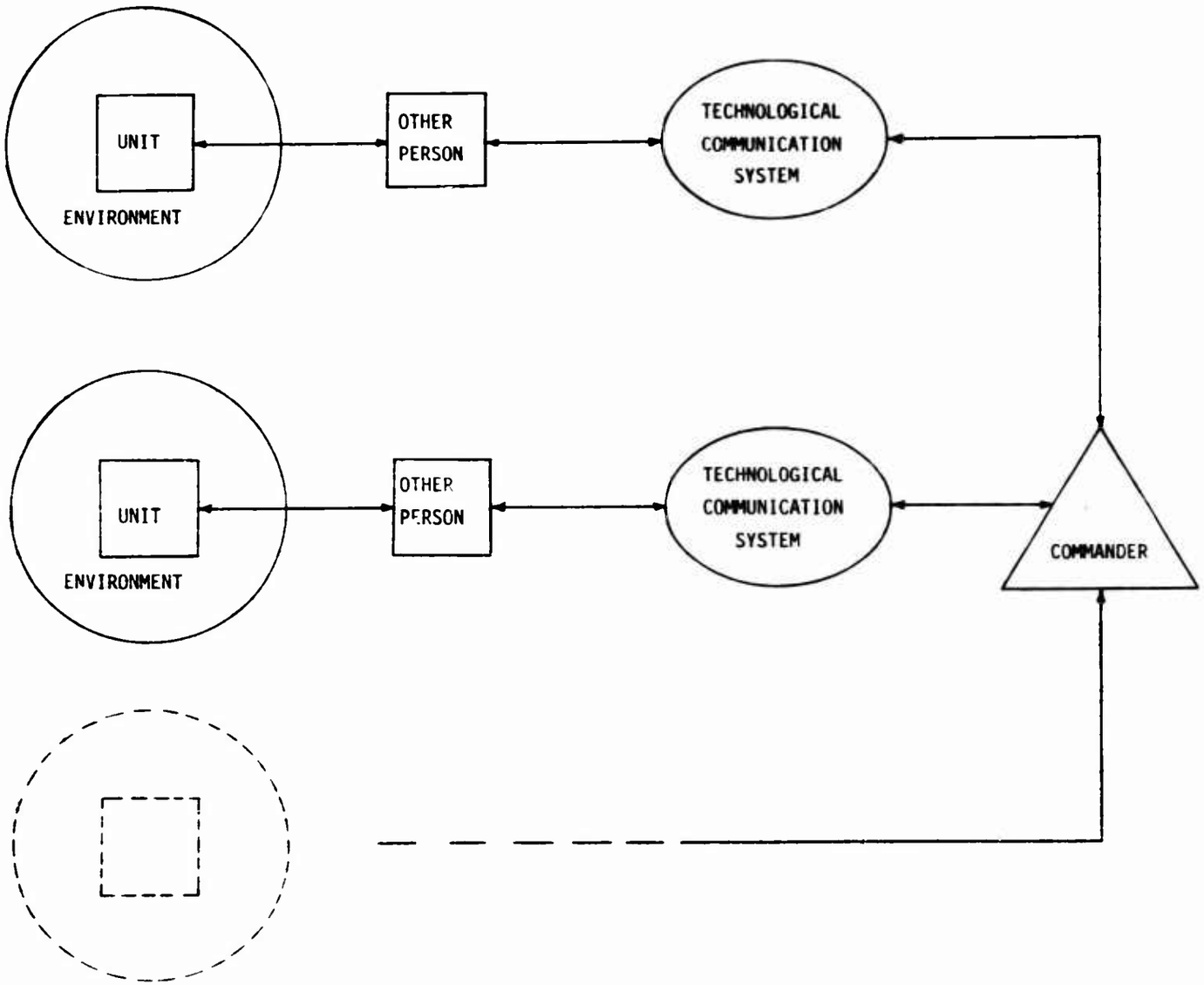

Figure 9. Partially Expanded Diagram of Basic Information-Flow System

For information flowing *from* the commander,

$$\text{delay} = \text{time}_{\substack{\text{receipt by}\\ \text{unit}}} - \text{time}_{\substack{\text{transmitted}\\ \text{by commander}}}$$

and

$$\text{error} = \text{information}_{\substack{\text{transmitted by}\\ \text{commander}}} - \text{information}_{\substack{\text{received by}\\ \text{unit}}}$$

The third measure, loading, is imposed by the limits to the amount of information any single individual can effectively receive, make decisions on, or transmit:

$$\text{loading} = \frac{\text{commander load}}{\text{commander capacity}}$$

Mode of organization and level of required detail of information also affect loading.

In the ideal CCSS, delay and error would be reduced to zero; and information would be transmitted to and from the commander in such a way as to effectively substitute for his actual physical presence. In this ideal case, the information load equals the commander's capacity for absorbing and using that information.

Information "Filters"

Such extraordinary improvements have been made in the technological communication system in recent years that a prediction of zero delay and zero error for this portion of the CCSS is possible. Reductions in delay and error in the technological system result initially in comparable delay and error reduction for the overall system. However, the improvement in reliability and speed has encouraged much more frequent use of such technological devices; and, combined with the generally increasing information demands and requirements of senior commanders, the net result is to overload the commander considerably. The changes introduced into the system as a result of this overload are shown in Figure 10, which is a further expansion of the basic CCSS.

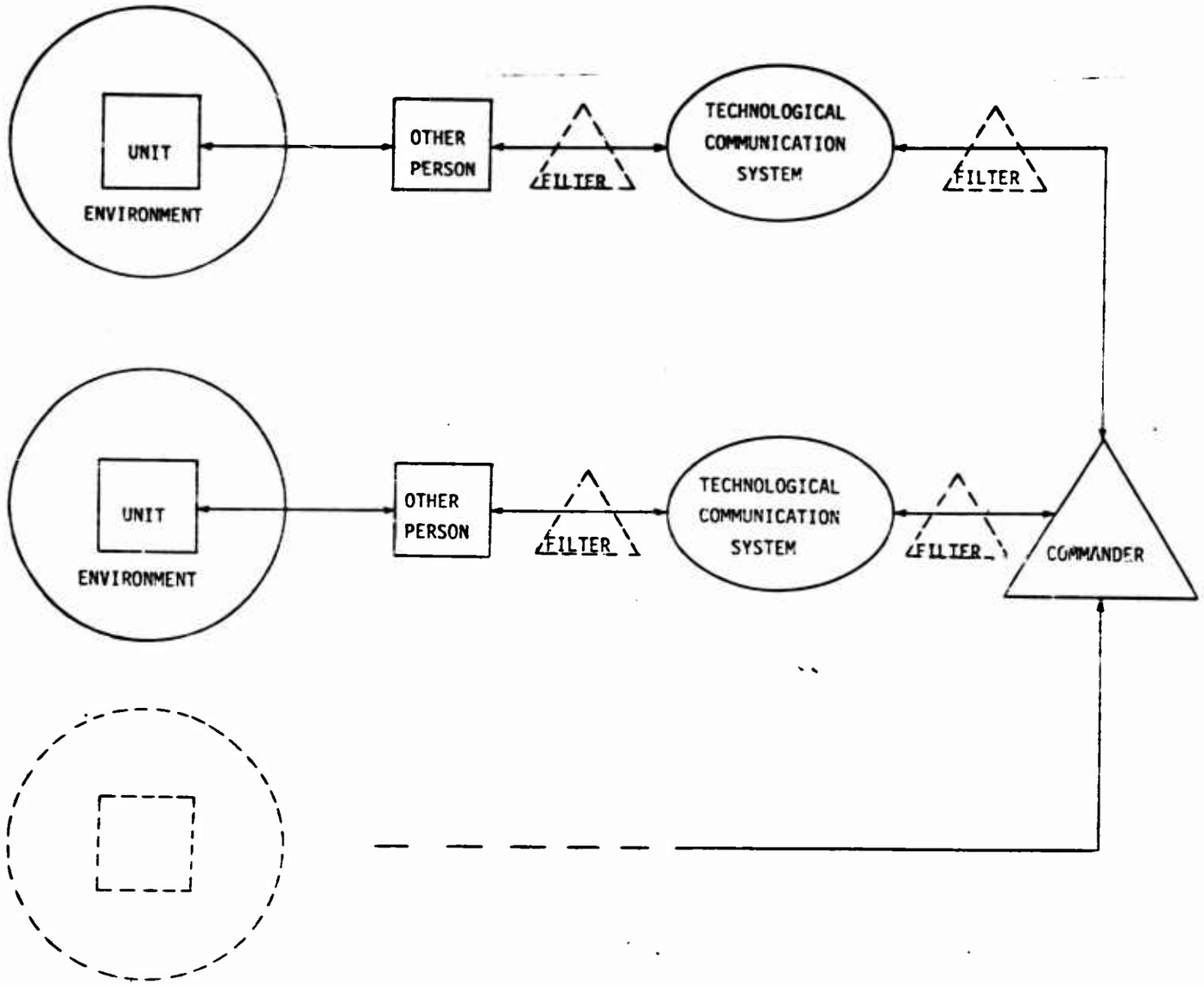

Figure 10. Fully Expanded Diagram of Information-Flow System

As shown in Figure 10, "filters" have been introduced into the system to rank information according to its relevance. The purpose of such relevance determination is to assure that only that information which the commander requires at any given time is transmitted to him; the load on the commander is thus reduced.

The number and location of these filters in the system is not limited or fixed. Filters at the right, or headquarters, end of the diagram may be large staff organizations; filters at the left, or unit, end may simply be the "other person" (often the unit commander) armed with a set of instructions regarding both what to report and when. (At this point we are concerned only with human rather than technological filters.)

The results of this study suggest that present human filters are inadequate to the task; in fact, they may actually *increase* delay and error. Despite the considerable progress in technological communication systems, despite the increased use by commanders of radio, telephone, and other technological command mechanisms, commanders tend markedly to return to the simplest form of the system as portrayed in Figure 8. All study data suggest that the time spent by senior commanders in establishing personal and direct contact with subordinate commands has not diminished appreciably from World War II to Vietnam.

This practice has worked well in Vietnam. However, several very sound reasons suggest that the substitution of personal presence for an inadequate CCSS is not the most effective solution to the problem; the following situations are illustrative:

> Some persons contend that such a system leads to harassment of subordinates and is inimical to the development of future commanders.
>
> In a tactical nuclear war, extreme dispersion and radiation hazard may make commander visits difficult and dangerous.
>
> Battle zone air control and intensive ECM of a sophisticated enemy would radically affect the command practice of helicopter visits employed so extensively in Vietnam.
>
> In general, the continuing trend toward increased troop mobility and dispersion tends to make extensive commander

visiting impractical—even though commander mobility also increases—because the ratio of travel time to visit time changes so much that decreased travel time has little or no positive effect.

Therefore, if commander visits cannot be relied on to fulfill all requirements, partial substitutes—improved human filtering mechanisms—are necessary to a truly effective CCSS. This system must be flexible and adaptive; it must be capable of changing in accordance with the demands of the situation and of the commander. It must, in effect, be a dynamic organism.

A Filter-Distance Model

In order to inprove the human filtering operation, the workings of the filtering operation itself must first be fully understood; this can best be accomplished through the use of a simple model.

The commander in physical contact with a unit—acting as his own filter—is the ideal case, and provides a standard against which all other possible human filtering mechanisms can be evaluated. For any human filtering mechanism other than the commander himself, three measures of effectiveness appear relevant:

Physical distance. As the filter is placed further from the commander, his ability to "see things the way the old man sees them" is likely to be impaired, and his effectiveness as a filter decreases. Physical distance from either the place of origin of the information (the unit) or of receipt (the commander) is relevant to effectiveness determination. The two distances may, to some extent, be traded off against one another or bridged by technology (as, for example, by the liaison officer who shuttles back and forth between two headquarters and who is equipped with effective technological communication devices).

Psychological distance. Persons who have never met, or who know little about each other, may perceive the same event or

action quite differently. Thus, a human filter who does not know the commander well may find it difficult to understand precisely what interests him; conversely, the commander may experience difficulty in interpreting information transmitted through an unknown source. The precise and critical components of psychological distance, whether actual personal contact, familiarity, or simply the same thinking process, are presently unknown. Also unknown is the extent to which broad-band width communication devices, such as television or videophones, can overcome all or part of the psychological distance separating any two or more persons.

Organizational distance. Two aspects of organizational distance appear to be relevant. First, whether or not the filter is responsible for the activity on which he is reporting affects the quality of the filtering. Second, absolute organizational distance is also significant; for example, the distance from company commander to his own battalion commander is quite different from the distance between the company commander and his corps commander. And the effect of using liaison officers from a higher to a lower headquarters also differs markedly from the effect of using them in the reverse pattern.

APPLICATION OF THE FILTER-DISTANCE MODEL

Stating the *form* of the model is, or course, but a first step. Before the model can be fruitfully employed in either analyzing or designing improved systems, values must be determined and assigned to the various combinations of the three distance factors; and to the specific hardware, organizational, or personnel techniques being considered. Table 1 illustrates a preliminary step in this process.

As shown in Table 1, the "techniques" have been divided into three general categories: *technological, organizational,* and *personnel* (primarily selection and training). The "Xs" indicate areas of initial concern; the following are illustrative examples:

Table 1. Preliminary Form for Application of Filter-Distance Model

Distance Factor	Technique		
	Technological	Organizational	Personnel
Physical	X	X	
Organizational		X	
Psychological	X		X

Physical distance, technological. By improving transportation, physical distance can obviously be reduced. However, such transportation improvements may also promote harassment and thus increase psychological distance. In any event, the development of quantitative relationships for various transportation modes is clearly indicated.

Psychological distance, technological. There is evidence that the increased availability of voice (telephone/radio) as opposed to written (teletype or courier) communication has enabled commanders to know their men better, that is, to reduce psychological distance. Whether further increases in technological communication bandwidth, say television or videophones will accelerate this positive effect, and to what extent, remains to be determined.

Physical distance, organizational. Physical distance may also be reduced by organizational techniques. For example, liaison officers or other human filtering mechanisms can be placed at varying distances between the commander and the unit in action. Here again quantitative relationships are required.

Organizational distance, organizational. Organizational changes are an obvious possible solution to organizational distance. Specific factors to consider include use of liaison officers up as opposed to down, simultaneous reporting, directives to more than one echelon, and the like.

Psychological distance, personnel. Possible areas of investigation in this category would include the effects of special selection techniques, ranging from increased selection of key staff and subordinates by the senior commander to possible "psychological matching." Training and career development might include such techniques as maintaining a continued association of the commander and his key staff officers.

These examples are merely illustrative of what must be considered. Ideally, precise quantitative relationships should be developed not only for each distance-factor/specific-technique pair, but for their interrelationships as well. In practice, it would be more fruitful to initially explore in detail a small number of especially promising combinations to provide concrete and usable data upon which hardware, organization, and doctrine decisions can be based in the near future. Research would thus be directed not at developing lists of information requirements and elaborate technological communication systems to transmit them, but toward understanding the rules by which commander, staff, subordinates, and hardware can be matched to achieve a flexible, adaptive, and efficient system.