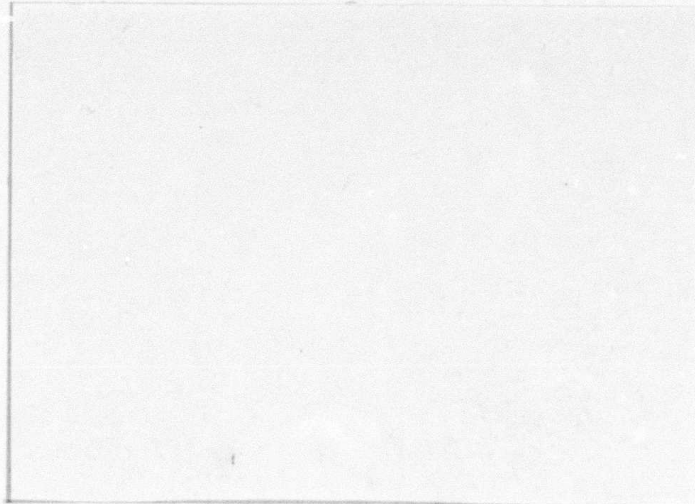


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LOGISTIC INCENTIVE STRUCTURES REFLECTED
IN IRREGULAR LOGISTIC PROCEDURES

(SHORT TITLE - INCENTIVE
STRUCTURES FOR IRREGULAR LOGISTICS)

Final Report
January 1980

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FORWARD

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Needless to say, responsibility for any errors, and for study conclusions and recommendations lies with the authors.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Background and Objectives

1. In 1976 DARPA established a Logistics System Technology Program which included the following objective:

Develop a new set of logistic incentives for quickly and significantly reducing costs while maintaining or improving effectiveness within current logistics procedures.

In pursuing this objective, DARPA contracted with Kappa Systems, Inc. (KSI) to accomplish a study of Incentive Structures Reflected in Irregular Logistic Procedures.

2. KSI's study had the objective, in furtherance of DARPA's program, of investigating the nature of the incentive structures reflected in the use of irregular (unauthorized) procedures in the U.S. military logistic system. This was accomplished by selecting a single type of unit--helicopter and helicopter support--and conducting an exploratory study of carefully limited scope which:

- o Defined the problem
- o Established pertinent specific and general hypotheses
- o Tested the specific hypotheses using a survey of selected personnel in military helicopter and helicopter support units
- o Provided appropriate findings, conclusions, and recommendations.

The Interim Technical Report, included as Appendix B to this document, covers the first two elements above: definition of the problem and the hypotheses. The main text of the Final Report of the study focuses on the latter two elements: the testing of specific hypotheses and the provision of appropriate findings, conclusions, and recommendations.

The Analytical Model

1. In order to define the problem, the study group devised an operational concept of the incentive structure behind the use of irregular logistic procedures. This overall conceptual framework emphasizes that every decision to use an irregular logistic procedure results from the impact of situational factors and motivational factors on the individual decision-maker.

2. To expand on the conceptual framework, the study team devised a User Decision Model, based on a decision tree approach to the problem, which breaks the complex decisions involving the use of irregular logistic procedures into component sub-decisions. The results of the field survey confirmed that the User Decision Model has analytical validity.

Survey Results

The survey produced a rich data base, analysis of which confirmed that:

- o the existence of unsatisfied demands creates a situation in which irregular logistic procedures perform an irreplaceable function essential to operational functioning of units.
- o the most powerful group norms and incentive structures are conducive to constructive use of irregular logistic procedures to satisfy mission related, unsatisfied demands.
- o secondary incentives are conducive to use of irregular logistic procedures for non-mission related, self-oriented objectives.
- o officers, warrant officers, frequently senior NCO's, and combat veterans generally tended to reflect a higher incidence of group norms and incentives oriented toward first, duty, the mission, and related concepts; second, use of irregular logistic procedures to satisfy unsatisfied mission related demands.

Conclusions and Recommendations

Conclusions are presented with respect to the military logistic system, types of irregular logistic procedures, group norms, and individual incentives. These are consonant with the study results cited above. In addition, General Conclusions and Recommendations were as follows:

GENERAL CONCLUSIONS

- A. A significant reduction in the non-availability of required items or services when needed at the user level should result in a significant reduction in the use of irregular logistic procedures.
- B. Design of equipment, and of repair parts and maintenance support policies for that equipment, could be accomplished in such a way as to minimize the use of irregular logistic procedures.

- C. The spectrum of types of irregular logistic procedures is graded in such a manner on functional and normative criteria as to permit design of human factors approaches minimizing use of selected, more harmful types of irregular logistic procedures.
- D. The use of irregular logistic procedures motivated by mission-related incentives cannot be eliminated in the real world without destroying operational readiness.
- E. There is an element of use of irregular logistic procedures motivated by non-mission related incentives which is undesirable and should be minimized. The concurrent existence of use of irregular procedures for essential purposes creates a psychological problem in fighting non-mission related uses. This should be recognized and studied explicitly to determine means of clearly delimiting the two types of use in the average serviceman's mind. The mission-oriented use should then be channeled constructively to minimize harmful side effects, the non-mission oriented use should continue to be rigorously discouraged.
- F. Generically, the constructive use of irregular logistic procedures does not appear significantly different than the newsman's pursuit of news from covert and unauthorized sources, the Congressman's insistence on cutting of red tape for his constituent, the law enforcement officer's operation of an "Operation Sting" fencing operation.
- G. That there is a great deal more detailed information in the data base developed from the study questionnaire than has been extracted for this study; however, analysis in further detail would be much more effective if accomplished based on a carefully designed sample appropriate to the particular objective at hand.
- H. The incentive structure and user decision models developed for use in this study were valid and useful.

RECOMMENDATIONS

- A. That the constructive use of irregular logistic procedures be recognized for the essential component of military logistic operations that it is, and not be treated as sex in the Victorian Age.
- B. That Service logistic systems be designed to, insofar as possible, equalize priorities for units with similar missions in a given locality, so that item/service imbalances leading to perceived utility of using gifts, favors, or bribes will be minimized.

- C. That the Services maintain and use as a readily available significant indicator data on the percent of all demands for mission-related items or services which cannot be met when presented at the user level. This should be done overall and by weapons system, aggregated and by appropriate command level.
- D. That budgetary consideration of O&S appropriations include as a mandatory element the estimated impact of funding levels for logistic support on the percent of demands satisfied when presented at the user level.
- E. That determination of the most cost effective accommodation to irregular logistic procedures be a part of weapons system design.
- F. That human factors studies be conducted aimed at maximizing benefits from and minimizing harmful effects from the use of irregular logistics procedures.
- G. That other appropriate fields of endeavor, public and private (commercial, industrial, professional) be examined from an irregular procedures viewpoint.

SECTION 1

INTRODUCTION TO THE STUDY OF IRREGULAR MILITARY LOGISTICS

SECTION 1

INTRODUCTION TO THE STUDY OF IRREGULAR MILITARY LOGISTICS

1.0 BACKGROUND

It is characteristic of military operations, particularly in combat and in other situations of high urgency, that a significant part of the supply and maintenance at unit levels is accomplished by irregular logistic procedures. These procedures are often perceived by participants as a matter of necessity. They range from unofficial parts swapping between organizations to cannibalization of equipment to misappropriation (i.e., taking items without authority). They include use of unauthorized "expeditors," and unauthorized "special arrangements" with salvage yards. Irregular actions may be masked from superiors in the logistic chain of command. They are, however, traditionally condoned by, and fostered by the demands of, operational commanders; thus they persist. At the same time, such actions can contribute to the inefficient distribution of supplies and services, and to failure to record valid requirements. Study of the incentive structures responsible for irregular logistic procedures can help in identifying the kinds of cost effective change that may lead to more efficient use of military resources in support of operational readiness and missions, while minimizing adverse effects on the military logistic system.

It is recognized that the subject of irregular military logistic procedures is sensitive, easily triggering strong emotions and preconceptions. The present study is not a critique of either the military logistic system or the individuals who occasionally make use of

irregular military logistic procedures. Rather, it is an empirical analysis of the relevant operational and logistic environment, attitudes, perceptions, and motivations reported by service personnel in considering the use of irregular logistics. Our findings provide empirical support for the widespread belief that the guts of irregular logistic procedures is the attempt by the individual to overcome, through improvisation and ingenuity, real or imagined operational logistic problems which are perceived to be otherwise incapable of resolution. Many of these operational problems are common to complex systems in both military and civilian environments, but their perceived consequences are made more critical by the urgent nature of missions conducted in the name of national security.

1.1 APPROACH OF THE PRESENT STUDY

This study has the objective of investigating the nature of the incentive structures reflected in the use of irregular logistic procedures in the U.S. Armed Forces. This has been accomplished through the selection of a single type of unit for an exploratory study of carefully limited scope which:

- Defines the problem
- Establishes pertinent specific and general hypotheses
- Tests the specific hypotheses through a survey of selected military personnel
- Results in appropriate findings, conclusions, and recommendations, including appropriate specific recommendations involving logistic incentives and procedures.

The type of unit selected for the exploratory study consisted of helicopter squadrons and their direct support units in two of the armed services. Helicopter unit supply and maintenance was selected for exploratory purposes as an element of the logistics system common to all services, involving a weapons system with high operational and logistic support

priorities. In this research, differentiation is made between the incentives and environments prevalent in such units under combat conditions and those prevalent under peacetime, garrison conditions.

1.2 CONTENTS OF THE FINAL REPORT

This Report defines irregular military logistic procedures and discusses the situational and motivational contexts in which they occur in terms of the individual's incentive structure for their use. It further outlines the research techniques applied to test hypotheses concerning the incentive structure and presents the research results in terms of hypotheses supported or denied, and in terms of detailed findings based on the survey of helicopter unit and support unit personnel. The Report concludes with appropriate recommendations. The organization of the Report is as follows:

- The remainder of Section 1 defines key terms and concepts used in the study, including the definitions of irregular military logistic procedures (1.3.1), demand and legitimacy of demand (1.3.2), incentive structure (1.3.3), and the user decision-making model (1.3.4). It further provides details of the research techniques employed in the study.
- Section 2 develops the research findings on the situational context of irregular military logistic procedures. It indicates the hypotheses supported and denied with respect to how servicemen perceive pertinent aspects of the military logistic system, the nature of demand for items and services, and the applicability of various irregular logistic procedures in a given situation.
- Section 3 develops similar research findings on the motivational content of irregular military logistic procedures, including hypotheses supported and denied.
- Section 4 summarizes the research findings and presents recommendations designed to maximize benefit from and minimize any deleterious effects of those irregular military logistic procedures reported to be helpful to unit effectiveness on the operational level.

In addition, the Final Report has three appendices:

- Appendix A provides the military, sociological, and psychological perspectives of irregular military logistics, derived from previous scholarship and experience, which served as background to the research hypotheses and study design of the current study.
- Appendix B consists of the Interim Technical Report of the present study, first issued in June 1979. The Interim Report details the definition of the problem of irregular military logistic procedures as a military, sociological, psychological, and systemic phenomenon.
- Appendix C consists of the field survey questionnaire applied to personnel in helicopter units and direct support units, the quantitative results of the survey, and selected responses to the unstructured "open" question of the survey instrument.
- Appendix D presents the statistically significant differences among component groups who participated in the field survey questionnaire by function, attitude and experience. This Appendix deals with differences by rank, career field, work group, combat versus non combat experience, degree of job satisfaction and military service component.

1.3 DEFINITIONS

An essential first step in addressing the incentive structure for the use of irregular military logistic procedures has been to formulate operational definitions for major concepts employed in the analysis. The need to create definitions is derived from the groundbreaking nature of this study; the subject of irregular military logistic procedures is not generally reflected in existing published material. Further, in order to ensure clarity and enhance objectivity throughout the study, it has been necessary to specify definitions for many terms and concepts. Some types of irregular military logistics are equally likely to be condemned as "improper" misbehavior or praised as "innovative cutting through red tape." These kinds of emotion laden characterizations

are counterproductive in the attempt to get at the reasons behind irregular logistic procedures on an objective basis. Consequently, it was considered important to specify the definitions of key terms and concepts used by the research team.

1.3.1 Defining Irregular Military Logistic Procedures.

The operational definition of "Irregular military logistic procedures" presented in the Interim Technical Report, defines irregular military logistic procedures as,

procedures for providing logistic support which are either specifically forbidden, or not authorized when other procedures to attain the same ends are specifically prescribed ...To constitute irregular military logistic procedures, either the goods or services obtained must be of military system origin, or the use to which they are put must be military related.

Irregular military logistic procedures thus encompass both the use of non-standard logistic procedures and the misuse of standard logistic procedures. The use of a specific procedures need not be prohibited by military regulations for it to be considered irregular, but in such cases an officially prescribed alternative to the irregular procedure must exist. It should therefore be emphasized that "irregular" procedures are not synonymous with "illegal" procedures, even though some irregular procedures are, in fact, contrary to civil or military law.

The specific types of irregular military logistic procedures relevant to helicopter supply and maintenance examined in this study include the following:

- Unauthorized stockpiling of supplies;
- Obtaining items or services from unauthorized (including nonmilitary) sources;
- Unauthorized exchanges ("trading") or use of supplies;
- Unauthorized fabrication of parts for military equipment;

- Use of unauthorized maintenance procedures, including unauthorized levels of maintenance;
 - Use of personnel for unauthorized purposes;
 - Intentional submission of incorrect documents to obtain items or services;
 - Unauthorized cannibalization of military equipment;
 - Unauthorized use of equipment with maintenance or other deficiencies;
 - Falsification of documents to obtain items or services;
 - Taking military items without authority (e.g. theft);
 - The use of gifts, favors, or bribes to facilitate one of the above.
 - The existence of irregular logistic procedures has been noted as a phenomenon of military operations since the establishment of a regular supply function in national armed forces. Napoleon, for example, praised the activities of his officers who did not hesitate,

" To improvise, replace one commodity by another, and secure the troops provisions 'by hook and by crook.'"¹
- The U.S. armed forces, throughout their history, have placed high value on the ability of officers and men to overcome supply problems through the use of initiative and improvisation.

The use of irregular procedures is not only historically universal in military logistics; it is also common to many areas of modern society. The existence of such procedures have been noted in civil aviation operations, large-scale financial institutions, national

¹Van Crevald (1977) Supplying War: Logistics From Wallenstein to Patton, p. 56

and state social welfare services, and socialist industries. All of these activities are characterized by a relatively complex structural organization in which operating procedures are centrally prescribed and resources are furnished primarily from centralized sources. These resources are used at the local level to achieve operational objectives, frequently of an urgent nature, which involve overcoming obstacles which have not been (and probably can never be) completely accounted for in centralized planning. In military science, the existence of such obstacles is a major element in what has been termed "the friction of war."² For such systems to operate efficiently at the local level, there appears to be a systemic requirement for a certain degree of irregular logistics as a red-tape-cutting, self-compensating element. But, this need for irregular procedures to make the system effective facilitates the use of irregular procedures by individuals or groups who wish to take advantage of the system for their own benefit. The challenge for all such systems is to differentiate the constructive use of irregular procedures from the detrimental ones; to make provision for sufficient "slack" in central controls to make constructive uses possible and efficient; and to minimize or eliminate the detrimental uses. This challenge is particularly critical to national security in the 1980's, when overall limitations on materiel and manpower resources in peacetime defense require the most efficient use of those resources available to the armed forces.

1.3.2 Definition of Demand As Used in This Study.

Irregular military logistic procedures are initiated by an individual's decision to use such procedures as a means of satisfying a specific demand for items or services. The role of "demand" in initiating the decision process makes it important to precisely define what is meant by "demand". The Interim Report developed the following

²Van Crevald (1977), p. 23. The term "friction of war" first appears in this usage in Karl von Clausewitz's On War.

Table 1-1

CONTEXTUAL TYPOLOGY OF DEMANDS

1. DEMANDS FOR ESSENTIAL ITEMS/SERVICES

Demands for items/services necessary to mission accomplishment. These are demands which must be satisfied in order to prevent a direct impact on the ability of units or individuals to accomplish their mission effectively. These demands are mostly related to support of weapons systems or other types of operating systems. (For example, demands for parts such as helicopter transmissions which must be furnished in order to prevent a reduction in operational readiness of the helicopter unit).

2. DEMANDS FOR CONTRIBUTORY ITEMS/SERVICES

Demands for items/services potentially contributing to mission accomplishment. These are demands for items or services which may be beneficial to mission accomplishment, but are not essential to it. They usually involve some element of increasing creature comforts for the troops, but may also increase efficiency of support operations or otherwise bear more directly on the mission. Often their principal impact on helping the mission is through improving human performance by raising morale, reducing fatigue, or creating better working conditions. (For example, demands for wooden tent floors, cubicles in Quonset huts, or concrete work pads in temporary field maintenance facilities).

3. DEMANDS FOR NONCONTRIBUTORY ITEMS/SERVICES

Demands for items of no benefit to mission accomplishment. These are demands for items or services which, for the purpose intended by the demand, will not improve mission capability--and may even reduce it. (For example, demands for tools intended to be taken home for personal use, or demands for use of a repair shop to service personal vehicles.)

operational definition for this term:

a claim for items or services to be supplied within a specified time frame...A demand includes a requirement to perform a procedure.

In the context of this study, "demand" is thus used in the economic sense and should not be confused with other common uses of the term, such as a direct order or an imperious request. This definition of demand is somewhat broader than but otherwise compatible with the definition given in the dictionary of U.S. Army terms³. Table 1-1, Contextual Typology of Demands, classifies the demands leading to the use of irregular military logistic procedures in terms of the operational context in which the demand can be made. As will be discussed later, this classification of demands is a mediating factor in the incentive structure behind the use of irregular military logistic procedures.

Demands can also be classified as either legitimate or not legitimate. A legitimate demand on the military logistic system, as used in this study, is a demand for an item or service authorized for issue for an authorized purpose from an authorized source. In effect, it is a demand which the military logistic authorities recognize as one which should be met by military supplies or services. A demand is defined as not legitimate if:

- the individual making the demand is not authorized to do so;
- the purpose to which the item or service will be used is not authorized; or
- the item or service is not authorized for issue.

In an operational environment, it may be relatively easy to use

³AR 310-25. "a valid requirement placed on the supply system by an authorized customer. Demand is categorized as recurring or nonrecurring and is measured in terms of frequency and quantity."

equipment manuals, supplementary documents such as SOP's or memoranda, and frequent contact with technical supply channels to learn what can be legitimately obtained from the technical supply section, most of the time. For less frequently used, or less directly mission-oriented types of items and services, an uncertainty factor may arise, leading to confusion as to what items or services can be obtained through a legitimate demand on the military logistic system.

The combination of the concept of legitimacy of demand and the physical availability of an item or service provides the three types of logistic responses to demand which were examined during the course of this study:

- the item or service is authorized and available, and can be furnished in response to a correctly phrased demand within the time frame required;
- the item or service is authorized but physically unavailable within the time frame required so that response to the demand will be belated; and
- the item or service is not authorized and therefore cannot be obtained through a legitimate demand.

These three types of response constitute the potential authorization status of an item or service. The significance of authorization status to the incentive structure behind the use of irregular logistic procedures is discussed in paragraph 1.3.3

1.3.3 Definition of the Incentive Structure.

When a specific demand for items or services is generated by an individual, his/her decision as to whether or not to use irregular logistic procedures is governed by an incentive structure consisting of situational context, motivational context, and the interaction between the two. Figure 1.1 presents the general conceptual model of the incentive structure developed for this study.

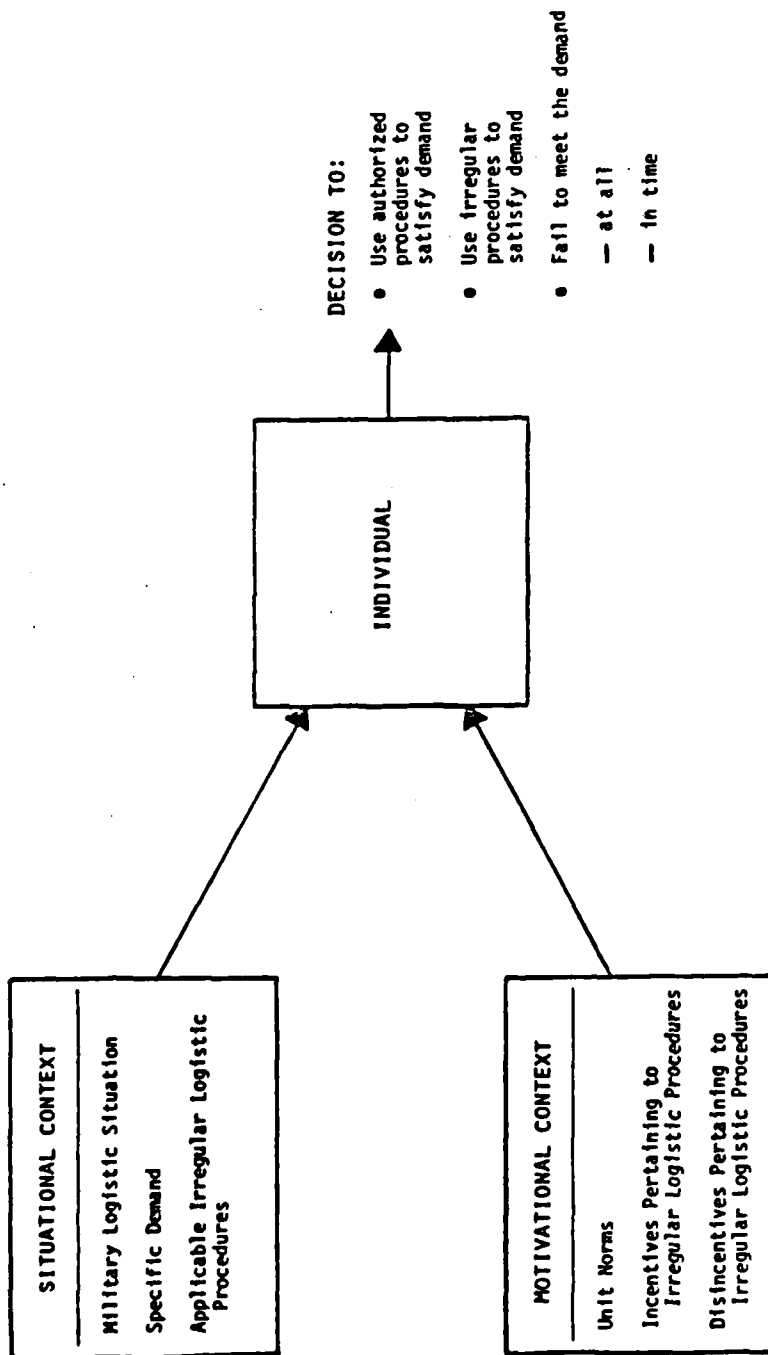


Figure 1-1. The Incentive Structure Governing The Use of Irregular Military Logistic Procedures

The situational context includes the military logistic situation, the specific demand, and the applicable irregular military logistic procedures. The military logistic situation for items and services is defined by two elements:

- Authorization Status. Is the item or service authorized and available in time?
- Nature of the Demand. Is the item or service essential to, contributory to, or irrelevant to the accomplishment of the mission?

For example, a situation may be defined as one in which an item perceived by a user as essential to the accomplishment of the mission is authorized but is not available through authorized logistic channels (e.g., due to temporary shortages) when needed. This is clearly a different situation from one in which an item is perceived by a user as potentially contributing to the accomplishment of the mission but is not authorized for issue. The second item listed under situational context is the specific demand, consisting of the item or service required to fulfill the demand and the date and time by which it is needed. The irregular logistic procedures perceived as applicable to a given demand, which constitute the third item of the situational context, come from the list in paragraph 1.3.1. The findings of this study in terms of the situational context are developed in Section 2.

The motivational context of the incentive structure is composed of unit norms and the sets of incentives and disincentives applicable to a given individual. Unit norms displayed by the chain of command and by work groups are human factors (e.g., things such as shared attitudes toward the use of irregular logistic procedures, toward duty and the mission, toward what should be encouraged and discouraged through group rewards and sanctions, etc.). These norms may be transmitted orally or (and especially for norms transmitted through official channels) in written form, as in Standard Operating

Procedures (SOPS). Incentives and disincentives potentially affecting the individual run the gamut from altruism and the satisfaction obtained from accomplishing a mission to acquisitiveness and the satisfaction obtained from rebelling against authority. It should be noted, however, that these are only potential incentives; a reward or sanction which fails to motivate cannot be considered an effective incentive. Findings of this study in terms of unit norms, incentives, and disincentives are developed in Section 3 of this Report.

1.3.4 The User Decision-Making Model. In Figure 1-1, the individual decision-making process is a "black box" influenced by the situational and motivational factors. This process is illuminated by Figure 1-2, which provides a model of the individual's process of initiating an action to satisfy a demand. In this study, it is assumed that the individual may be a helicopter mechanic or crew chief, supply clerk, or superior in the chain of command who assumes responsibility for deciding how the demand will be satisfied. Figure 1-2 indicates five channels of communication furnishing the individual with information about the situational and motivational contexts affecting his or her decision, including demands:⁴

- Command Channels--the hierarchial military organizational structure for the helicopter units being studied.
- Technical Channels--the corresponding hierarchial military logistic organizational structure.
- On-site Beneficiaries--the individuals whose operations or environment will be affected by the demand (helicopter crew for helicopter maintenance; tent-mates for installation of a wooden tent floor, etc.). The individual

⁴Most of this information has been provided prior to the occurrence of a given demand in most cases, and is resident in the individual's memory.

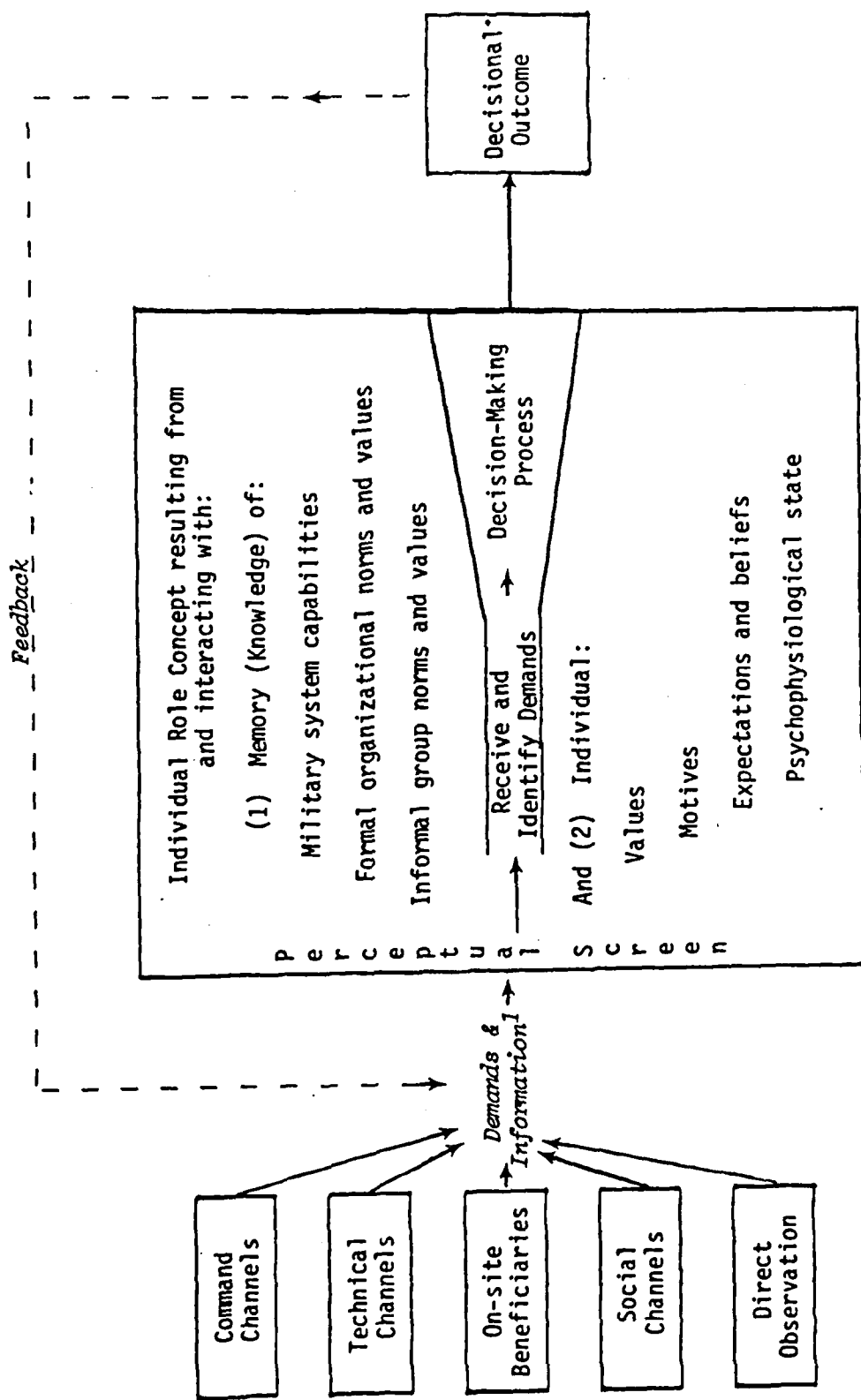


Figure 1-2 Simplified Model of Individual Initiating Action to Satisfy a Demand for Items and Services

¹ "Information" includes pertinent information on all elements of the incentive structure.

making the decision may also be an on-site beneficiary, as in the case of the helicopter crew chief who frequently flies in the aircraft he or she maintains.

- Social Channels--the peer group (i.e., buddies, co-workers) who can make demands and provide information including expression of approval or disapproval of decisions taken.
- Direct Observation--the individual can observe from the environment the need for and item or procedure (e.g., the helicopter mechanic may notice a cracked tail rotor blade at a scheduled maintenance or may note the need for a wash basin in his/her quarters).

After a demand is identified, the individual must make a series of decisions, either implicitly or explicitly, related to the possible satisfaction of the demand. Figure 1-3 is a decision "map" which expands the decision-making process illustrated in Figure 1-2 and concerns current demands for items or services.⁵ Figure 1-3 contains six decision points concerned with the use of irregular logistic procedures to satisfy the demand. The same factors which affect the individual's selective perception of demand also affects this decision process.

The decision-making process begins with Decision Point I of Figure 1-3: the decision as to whether the demand is identified as legitimate or illegitimate, in terms of the criteria of the logistic system authorities.⁶ This classification of demands may be implicit, requiring little or no conscious thought, but it is the essential first step in determining whether a demand can be

⁵ Other types of decisions potentially leading to the use of irregular logistic procedures are outlined in Paragraph 3.4 of the Interim Report, Appendix B.

⁶ This decision is not always simple. Local logistic authorities may be uncertain or incorrect as to what is legitimate--particularly for items which contribute but are not essential to mission accomplishment.

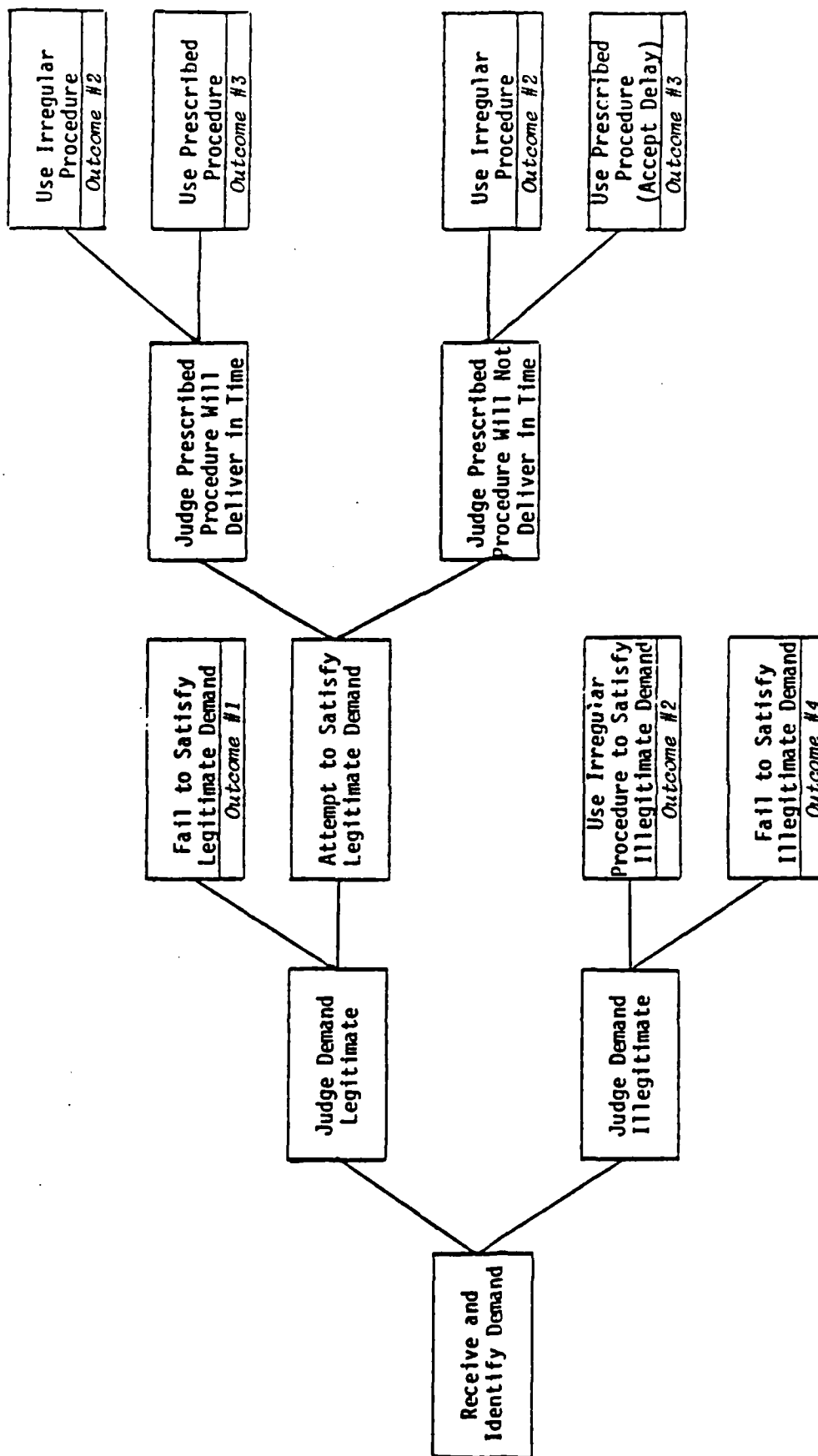


Figure 1-3. Decision Map for the Use of Irregular Logistic Procedures to Obtain Items or Services to Satisfy Current Demands

addressed by following prescribed logistic procedures. At this stage of the decision process, irregular procedures can arise from a failure to correctly distinguish between legitimate and illegitimate demands on the logistic system. An incorrect determination by the individual that a demand is legitimate will not result in an irregular logistic action unless the source of supply makes the same error. But an incorrect determination that a demand is illegitimate is capable of leading to the unnecessary use of an irregular logistic procedure.

Decision Point II is reached when an individual has identified a demand as a legitimate one--one that the military logistic system is intended to satisfy. The individual must now decide whether or not to satisfy the demand. In most cases, if an individual decides not to fulfill a legitimate demand, even before timeliness of demand satisfaction is considered, it is likely to be due to work overload and established priorities. In this situation, an individual may reject legitimate low priority demands in order to concentrate on higher priority actions.

Decision Point III involves the judgment (based on past experience, informal advice, or formal query of the authorized source of supply) that regular logistic procedures can or cannot satisfy the demand within prescribed time limits. If it is decided that the demand can be satisfied in time through prescribed procedures, Decision Point IV is reached: a choice between using prescribed and irregular procedures. In this situation, there is no significant operational reason to justify the use of irregular procedures; nevertheless, certain incentives could bring about a decision to use irregular procedures (e.g., to avoid paperwork required by prescribed procedures). If it is decided that the demand cannot be satisfied in time through prescribed procedures, Decision Point V is reached: a choice between using irregular procedures and accepting the delay

required by the use of prescribed procedures. Decision Point V most clearly invokes operational necessity as the justification for the use of irregular logistic procedures in that the mission will suffer if irregular procedures are not used.

Decision Point VI involves the decision to satisfy an illegitimate demand. In this case, any decision to satisfy the demand involves irregular logistic procedures, since the demand is one that the supply system has specified as "not to be filled."

These aspects of the individual's decision-making process concerning the use of prescribed and irregular logistic procedures proved to be critical in formulating the hypotheses tested during the course of the study. Each decision point was examined in order to identify the situational and motivational factors which potentially affected the individual's decision at that stage of the decision-making process. The result was the reflection in hypotheses of an extensive array of incentives, norms, and situational factors which might contribute to the decision to use irregular logistic procedures, either in general or specifically in the types of helicopter units in which the field survey was run.

1.3.5 Additional Concepts.

The definition of additional terms and concepts, and more detailed discussion of the terms and concepts reviewed above, can be found in the Interim Report, Appendix B of the current Report.

1.4 OVERALL RESEARCH METHODOLOGY

The overall research methodologies employed in the present study were oriented to exploring irregular military logistic procedures as military, sociological, and psychological phenomena. As a result, the methodologies selected are eclectic, consisting of a literature review, the use of consultants, and the use of re-

connaissance research to define the problem; the development of general and specific hypotheses subject to empirical tests of validity; and the design, administration, and analysis of a yield survey of military personnel with experience in the types of helicopter and helicopter support units under study.

1.4.1 Literature review, reconnaissance research, and the use of consultants

The development of hypotheses and design of research required a thorough, detailed definition of irregular military logistic procedures as military, sociological, psychological, and systemic phenomena. In part, this was accomplished through a re-examination of the literature in these fields to ensure that nothing bearing on irregular logistic procedures was overlooked. The bibliographic services of the Defense Documentation Center, repository for all military studies, were used to obtain several reports pertaining to this problem. Additional institutions surveyed in the search for material directly applicable to irregular logistics include:

- DARCOM
- The Army Library of the Pentagon
- The Navy Library (Crystal City annex)
- the Industrial College of the Armed Forces
- the National War College Library
- the Army War College
- the U.S. Naval Academy Library
- the Air University Library
- the Library of Congress
- the George Washington University (repository of the studies of the GWU Program in Military Logistics)
- Georgetown University Library
- the Defense Logistics Studies Information Exchange

In general, the exploration of existing literature revealed little objective research performed on the subject of irregular military logistic procedures in either the military or social science fields. A few reports of the General Accounting Office make reference to the existence of such procedures; several works on military history and military sociology address the question indirectly or in anecdotal form. The results of the literature search are reflected throughout this Report, but particularly in Appendix A.

Inferences drawn from the examination of the literature and preliminary definition of the problem were reviewed by a team of expert consultants with command and logistic experience in Army, Air Force, Navy, and Marine Corps aviation. The consultants provided additional insights into irregular military logistics at various military organizational levels, and helped to refine the definition of the problem. As a group, the consultants emphasized the importance of mission accomplishment and the need to maintain aircraft operational readiness levels as incentives for the use of irregular logistic procedures throughout armed forces aviation, in both combat and peacetime conditions.

The further definition of the problem and the development of testable hypotheses concerning the use of irregular logistic procedures in military helicopter and helicopter support units was facilitated through the use of the reconnaissance research technique. This technique, applied to the Marine Corps in an earlier study by Blair and Fairis,⁷ consisted of a small number of group discussion sessions (approximately 90-120 minutes) with a small number of individuals with unit-level experience in military

⁷ John Blair and John H. Fairis (un.) "Unit-Building in The Marine Corps: Report on A Sociological Reconnaissance."

logistics. These group discussions were conducted by a team consisting of one individual with broad operational and logistic military experience and one or more trained social scientists, all of whom had participated in the earlier phases of the study. The composition of the reconnaissance research discussion groups was diverse, including experienced personnel from the ranks of E-5 to O-3 from Army, Air Force, and Naval aviation and support units. This carefully planned diversity optimized the potential for the use of the results in subsequent hypothesis formulation and survey design, by directing discussion along the lines suggested by the model of the incentive structure and user decision-making presented in Section 1.3 of this Report.

These three procedures--literature search, the use of consultants, and reconnaissance research techniques--led to the development of a detailed definition of irregular logistic phenomena in military helicopter and helicopter support units, and to the development of hypotheses.

1.4.2 Formulation of Hypotheses.

The next step in the study methodology was the development of a set of generalized and a set of specific hypotheses. The general hypotheses were applicable to the general subject of the use of irregular logistic procedures and were considered to be too broad to be significantly tested within the scope of this study. However, they served as the framework for, and were partially tested by, specific hypotheses applicable to the analysis of supply and maintenance procedures in helicopter and helicopter support units. Both sets of hypotheses were based on the theoretical models established for the incentive structure and individual decision-making (Sections 1.3.3 and 1.3.4). The specific hypotheses were carefully formulated to be testable through a survey of a limited sample of personnel with

experience in military helicopter and helicopter support units, and covered the following topical areas:

- Perceptions of the different types of irregular procedures which may be used in terms of net impact on unit effectiveness under combat and garrison conditions;
- The individual's ability to determine the legitimacy of a demand;
- The perceived capability and willingness of the military logistic system to fill demands for items and services under garrison and (overseas) combat conditions;
- The role of the chain of command in the use of irregular logistic procedures under combat and garrison conditions;
- Work group norms affecting the use of irregular logistic procedures under combat and garrison conditions;
- The influence of specific incentives and disincentives on logistic decisions under varying logistic conditions;
- The perceived applicability of maintenance shortcuts in garrison conditions compared to combat conditions;
- The existence of a pattern of influence conducive to hoarding (i.e., unauthorized stockpiling) of helicopter parts.

Detailed discussion of the specific and general hypotheses, and the results of the survey on their confirmation/disconfirmation, are included in Sections 2 and 3 of this Report.

1.4.3 Design and Administration of the Field Survey.

To test the hypotheses, a field survey was designed and administered to 253 individuals, currently on active duty in heli-

copter and helicopter support units in two of the armed services. Early in the formulation of the study, it was decided that at least 25% of the survey respondents would be required to have Vietnam experience, in order to permit examination of the use of irregular logistic procedures under wartime conditions. It was recognized that surveying respondents on actions undertaken in Viet Nam could produce recall problems because of elapsed time, but no more recent war has been fought and the definition of the problem indicated that the ability to provide logistic support for combat missions appears to be the sine qua non for all logistic procedures, prescribed and irregular. However, pursuing the question of recall informally with a number of individuals with such past experiences indicates an apparent strong tendency for recall associated with irregular logistic procedures. Other considerations used in selecting the sample were:

- selection of respondents with career assignments organizationally relevant to the research problem. These included helicopter unit commanders and pilots, maintenance and supply officers, helicopter mechanics, non-commissioned helicopter maintenance supervisors (including crew chiefs), non-commissioned supply supervisors, and enlisted supply personnel.
- selection of respondents from a number of work groups (i.e., military units with varying operational missions), to permit assessment of differences in unit norms and experiences; and
- selection of respondents from two large bases, permitting administration of the survey to 100 or more respondents within a relatively short time period (3-4 days).

The survey instrument was designed, pre-tested, and revised to elicit carefully structured information in a form conducive to statistical coding, tabulation, and analysis of results. The resulting questionnaire, included in Appendix C of this Report, with a summary of answers to each question, elicited information in the following subject areas:

- individual characteristics such as education, rank, career orientation, combat experience, etc.
- general military attitude including perception of military service as a career, satisfaction with supervisors and co-workers, etc.
- substantive information on irregular logistic procedures.

Additionally, survey respondents were offered the opportunity to respond to an unstructured question in their own words in order to encourage freedom of expression and produce a more favorable attitude toward the survey itself among the respondents. Due to the unstructured nature of this question and the resultant considerable variation of the subjects of the comments elicited, responses to the final question of the survey have been used for illustrative purposes only; a brief discussion and the sample comments are included in Appendix C.

The survey was pretested in June 1979, using personnel interviewed earlier during the reconnaissance research. As a result of the pretest, several questions were rewritten for the sake of readability, clarity, and consistency of interpretation. The survey in its revised form was administered during August and October 1979 at two large military bases in the southwestern United States. Respondents were selected from seven "work groups" (company and

battalion-sized units) involved with helicopter operations and/or direct support, with the sample size per "work group" varying from 20-46 respondents. 40% of the total of 253 respondents were from one of the armed services; 60% were from a second armed service. Eighty-eight respondents (slightly less than 35%) were veterans of Vietnam era combat; these logically tended to be more senior and career-oriented personnel than the 165 respondents who had no combat experience.

Table 1-2 provides the distribution of the 253 respondents by current military rank and, where applicable, by highest rank achieved under combat conditions. It should be noted that all of the warrant officers and most of the officers came from a single service. Respondents reported up to 27 years of active military service, with approximately half reporting eight or more years. There was no significant differences between the two services in this respect.

Table 1-3 provides the breakdown of respondents by the nature of helicopter-related assignments held during their careers. The total number of assignments held is greater than 253 because some respondents have held more than one type of assignment in military helicopter supply, maintenance, or command.

Two-thirds of the respondents (167, or 66.1%) reported that they currently supervised at least one other individual. Of these, 113 (44.5% of the total) supervised eight or fewer individuals. Twenty respondents (8% of the total) reported supervising between 20 and 208 other personnel.

Nearly one-fourth of the respondents flew regularly in their most current helicopter-related assignment; an additional 20% flew infrequently. Among respondents with combat experience, 61% had often flown in helicopters during their combat theatre assignment and another 9% had flown infrequently. There was a marked difference

Table 1-2. Distribution of Survey Respondents by Rank

	<u>Current Military Rank</u>		<u>Highest Rank Attained in Combat (if applic.)</u>
Enlisted (E1-3)	82	(32%)	11 (12.5% of vets.)
Junior NCO (E4-6)	69	(27%)	41 (46.5% of vets.)
Senior NCO (E7-9)	40	(16%)	5 (5.5% of vets.)
Warrant Officer	20	(8%)	12 (13.5% of vets.)
Officer (O1 - O6)	40	(16%)	18 (20.5% of vets.)
Civilian Employee	2	(1%)	1 (1.2% of vets.)

Table 1-3. Distribution of Survey Respondents by Helicopter-Related Military Assignment

<u>Nature of Assignment</u>	<u>Number and Percent of Respondents With Ex- perience in Assignment</u>	
Helicopter Unit Commander	21	8.3% (1-7 years of exper.)
Maintenance Officer/Warrant Officer	40	15.8% (1-11 years of exper.)
Supply Officer/Warrant Officer	31	12.2% (1-6 years of exper.)
Maintenance NCO	68	26.9% (1-18 years of exper.)
Supply NCO	56	22.1% (1-20 years of exper.)
Helicopter Mechanic	122	48.2% (1-24 years of exper.)

between the two services surveyed in this respect.

All but six of the respondents were high school graduates. An overwhelming majority (201, or 79.5%) either had no college or "some" college. Of the forty-seven college graduates included in the sample, 26 had either completed or partially completed a postgraduate degree; the majority of these were officers.

In terms of their career plans, approximately one-half of the respondents (131, or 52%) either planned to make the military service their career or were planning to shortly retire from a relatively long career in military service. Approximately one-fourth (65, or 25.5%) reported either that they planned to remain on active duty without making the service their career, or planned to return to civilian life. The remaining 56 respondents (22%) planned to continue on active duty but were undecided about choosing military service as a career. There appeared to be no significant differences between the two services in this respect.

1.4.4 Analysis of Survey Results. The analysis of the survey results provides:

- Assessment of implications for the specific hypotheses
- Assessment of implications for the general hypotheses
- Support for general conclusions
- The basis for recommendations, including identification of major areas for further investigation

Careful design and pretesting of the survey questionnaire kept the number of ambiguous responses to a minimum and permits categorization of responses to specific survey questions which confirms or disconfirms specific hypotheses and suggests new or modified specific hypotheses. The responses were quantitatively (i.e., statistically) analyzed to determine;

- which specific hypotheses are disconfirmed;
- which specific hypotheses appear confirmed (i.e., have not been disconfirmed despite sufficient opportunity for disconfirmation)

- what modifications to preexisting specific hypotheses or entirely new specific hypotheses appear warranted
- what other observations or inferences appear appropriate

From these results an overall assessment has been drawn with reference to:

- the situational contexts in which irregular logistic procedures occur in helicopter and helicopter support units, under combat and garrison conditions (section 2).
- the motivational context affecting the use of irregular military logistic procedures in helicopter and helicopter support units, under combat and garrison conditions (section 3).

Section 4 then assesses implications of the preceding for the general hypotheses and provides general conclusions and recommendations, including identification of major areas for further investigation.

SECTION 2

DATA ANALYSIS: THE SITUATIONAL CONTEXT

SECTION 2

DATA ANALYSIS: THE SITUATIONAL CONTEXT

2.0 GENERAL

This section discusses the general characteristics of the data sample, the approach used to analyze it, and the two components of the situational context (as described in Figure 1-1, the Irregular Logistics Incentive Structure). These two components are the military logistic situation and the types of irregular procedures. The analysis results are discussed, then applied to validation of applicable hypotheses, in a sequence derived from the models and discussion of Section 1 and Appendix B.

2.1 METHODOLOGY

The discussion of methodology is in two parts: discussion of sample characteristics, and general analytic procedures.

2.1.1 Sample Characteristics. The sample consisted of Army and Air Force personnel of varying ranks and experience in units operating helicopters, or directly supporting units which operate helicopters. These personnel came from two bases, one Air Force, one Army. Thus, they did not constitute a random sample of such personnel in the services; further, they were personnel furnished by their units without any study controls as to individual inclusions or exclusions. Several factors suggest, however, that the sample is adequately representative of those elements of helicopter and helicopter direct support units of particular concern. In both cases, the bulk of potential personnel were made available. In both cases there was considerable voluntary, unscheduled and unsolicited contact by respondents with the individual

administering the survey questionnaire. These respondents were quite interested in the survey and wished to discuss the subject further--in one case an individual flagged down the survey administrator as he was driving off post. The comments received in such encounters reflected uninhibited participation in the survey. The survey results tended to confirm this observation. The respondents included some obviously dissatisfied, disgruntled personnel, of the type who would have been the first to be screened had there been an organized attempt to inhibit participation. It is the study team's conclusion that: (1) they received wholehearted cooperation from the Services; (2) that use of analytic procedures which are based on random sampling are technically not warranted, but, given the nature of the sample and the frequent re-assignment and mixing of service personnel, these analytic procedures probably produce results adequately representative of what would have been obtained from random sample.¹ The survey results provide intuitive confirmation of this.

Table 2-1 gives a breakout of the sample by the different types of component groupings (group sets) used to analyze for differences among respondents. The average group population is 65, with minimum size of 20. Appendix D provides a detailed analysis of differences in questionnaire responses by each type grouping listed in Table 2-1. It would be possible based on the questionnaire to make further disaggregations within the group sets shown in Table 2-1 (e.g., by rank, by career group, by service) but the sample size would not support this. Should such disaggregations be desired, sample respondent populations would need to be designed specifically for this purpose.

¹Excluded were such small, unrepresentative groups as the Presidential support helicopter detachments, but primary concern is with the bulk of the operating force, which is where this sample came from.

Table 2-1. Group Composition, Sample Group Sets.

Type Group Set		Total Group Population
<u>Rank:</u>	Enlisted (E1-4)	82
	Junior NCO (E5-6)	69
	Senior NCO (E7-9)	40
	Warrant Officer	20
	Officer ^b	40
	Civilian ^b	2**
<u>Career:</u> ^c	Maintenance	179
	Supply	53
	Command	20
<u>Work Groups:</u> ^d	A	45
	B	34
	C	20
	D	35
	E	38
	F	38
	G	40
<u>Combat</u> vs. <u>Non-Combat</u>	Combat	86
	Non-Combat	167
<u>Job Satisfaction</u>	Dissatisfied, Environment ^e	31
	Dissatisfied, Career	55
	Dissatisfied, Both	35
	Satisfied with All	130
<u>Service</u>	Army	153
	Air Force	100

- a). Totals for groups may be less than 253, the total sample size, due to missing data.
- b). Excluded from groups by rank consideration due to small sample size.
- c). Career position held in last relevant non-combat (garrison) position.
- d). Work Groups A,B,D,E represent operating units. Work Groups C and F represent support units. Work group G represents higher headquarters-type personnel.
- e). Environment in this case means leader or work group.

Section 4 of Appendix C provides a tabular display indicating which group sets (rank, career field, etc.) reflected significant differences among their component groups (such as/officers, warrant officers, top nco's, etc. for rank) for which questions. This information is summarized in Table 2-2. Of particular note are:

- The comparatively small number of significant differences among groups with respect to individual incentives. Ten out of 27 questions showed no significant differences among groups for any of the six group sets.
- The relatively great overall agreement among groups. The average number of significant differences among groups in a single group set is only one per six questions.
- The three gradations of group sets in terms of significant differences among their component groups:
 - Rank, with a large preponderance - almost twice the overall average
 - Work group and type experience (combat versus garrison) both very close to the overall average for all groupings
 - Service, job satisfaction, and career field at two-thirds to three quarters of the overall average.

Because overall there are so many group differences, most of them are treated only in rather summary form in the text. Because these differences may be of particular interest to various readers, many footnotes are provided indicating where in Appendix D specific information may be found. These footnotes are for the convenience of the reader with a special interest, and the reader without such an interest should not be distracted by them.

2.1.2 Statistical Analysis. The nature of the hypotheses set forth in the interim report (Appendix A) places requirements for two types of

Table 2-2 Summary Table, Group Differences

Totals		Number of Group Differences per Set of Questions					Sets of Questions (Number of Questions in Set)
		Military Ranks	Career Field	Work Group	Combat vs. Non-Combat	Job Satis- faction	Military* Service
#	%						
26	15	8	5	8	0	2	Logistic Situation(58)** garrison (28) combat (28)
44	26	10	5	9	7	8	
15	17	6	2	1	1	3	Type Procedure(30) garrison (15) combat (15)
22	24	3	2	4	9	1	
37	34	12	3	3	11	5	Group Norms(36) garrison (18) combat (18)
17	19	3	2	4	na	4	
15	10	8	0	4	0	0	Individual Incentives (77) unauthorized items (24) authorized, not avail. (26) authorized, avail. (27)
14	9	9	2	1	2	0	
8	5	2	0	1	3	0	
198	-	61	21	35	33	23	# Totals (201)
-	17	31	11	18	17	12	
							%

* 11 of the differences initially determined as due to Service were ascertained to be due to sample imbalances, and were eliminated from the numbers shown.

** Two questions in this group were not broken out by garrison vs. combat. They reflected no significant differences for any group.

analysis for validation purposes. For all hypotheses, marginals are required to provide a summary indication of respondent answers to questions. After considering the Likert scale nature of most of the questions, it was concluded that a simple ANOVA test for significance (using the .05 probability level for the null hypothesis) was the best estimate of statistical difference in group responses. While this is technically inappropriate with a sample which is not demonstrably random, the characteristics of the sample as described above, plus observation of results, suggest that it suffices for an exploratory analysis such as this one. In addition to the preceding, and based on the same rationale, factor analysis was used as an aid for grouping questions in certain sets (such as the set of group norms and of individual incentives to use irregular logistics under given conditions). It is interesting to note that the factor analysis frequently produced what might best be called a normative grouping of variables.

The above techniques do not by any means exhaust the potential for analysis of the data based obtained from administration of the questionnaires, as it has proved to be quite rich; but they do suffice for the objectives of this study.

One statistic not cited above, and not used, is the mean. This, given the Likert scale nature of most of the questions, would appear to be a logical statistic to consider. In the context of most of the questions, however, the mean has a very indeterminate substantive meaning. On a five point scale from strong incentive to use irregular procedures to strong disincentive (or very harmful to very helpful, or the like), a mean of 3.0 could mean all respondents answered in a neutral vein, or equally that half answered very positively, half very negatively. The substantive meaning would be very different in these two cases. Consequently, presentations are made in terms of a three point scale (such as helpful, neutral, harmful; incentive to use, no incentive, incentive not to use). This three point scale is collapsed for clarity and brevity, with the full five point scale retained in Appendix B,

in the questionnaire format (in which the marginals for each question are given).

2.2 THE MILITARY LOGISTIC SITUATION.

In order to get at the information needed to provide the environmental context in which irregular logistic procedures are used, the survey questionnaire asked eleven clusters of questions generally directed at five themes:

- What circumstances give rise to unsatisfied demand which may lead to use of irregular logistic procedures?
- Is use of irregular logistic procedures justified by these circumstances?
- Could the job get done without the use of irregular logistic procedures?
- At whose instigation do irregular logistic procedures occur?
- What are the consequences to individuals who use irregular logistic procedures?

A factor analysis was performed on the data resulting from these eleven clusters of questions. The factor analysis indicated primarily that the questions in each cluster were related to each other, which is unsurprising. It provided some indication of association of two question clusters within the first theme³, the same indication of cross association between certain question clusters of questions when dealing only with items of no benefit to the mission; but essentially it provided nothing that was not obvious. Consequently, factor analysis will not be discussed further in addressing the military logistic situation. Survey results pertaining to the military logistic cluster will be discussed in terms of the five themes listed above.

³ This involved primarily a degree of linkage between questions clusters 36 and 41 concerning feelings that use of irregular logistic procedures is justified when authorized items are not available (36) or when items perceived as needed are not authorized (41).

2.2.1 What Circumstances Give Rise to Unsatisfied Demand Which May Lead to Use of Irregular Logistic Procedures?

This theme involves three question clusters. These ask:

- Can the individual tell what is authorized for issue?
- If the individual feels something is needed, how often will the system refuse to authorize it?
- How often is the system unable to furnish authorized items when needed?

Tables 2-3 through 2-5 present these question clusters with the responses given. Based on these tables we can make several observations.

First, lack of knowledge of what items are authorized appears common enough to contribute at least occasionally to the use of irregular logistic procedures when someone uses an irregular procedure in ignorance that an item is authorized. Given the multiplicity and complexity of supply in today's military environment, and the turnover of personnel characteristic of the military, this is a problem that can reasonably be minimized, but not eliminated.⁴

As indicated in Appendix D,⁵ there is considerable difference among the different career groups under some circumstances with respect to their ability to determine what is authorized. Of particular note is the fact that this appears to be a far greater problem for command personnel in garrison for items necessary to the mission than it is for supply or maintenance personnel.

Second, lack of authorization by the logistic system for items which an individual believes to be required also appears common enough to contribute significantly to the use of irregular logistic procedures. This is something which is inherent in the nature of warfare and of human beings for a number of reasons, two being particularly relevant:

⁴Heiser (1974) notes many potentially contributing personnel turbulence problems in a theater of operations.

⁵Appendix D, Section 3.0

Table 2-3. Question: Without asking your source of supply, how often do you have difficulty in telling the difference between what is and what is not considered authorized by the logistic system for the following types of items: (as specified below under "Nature of item")

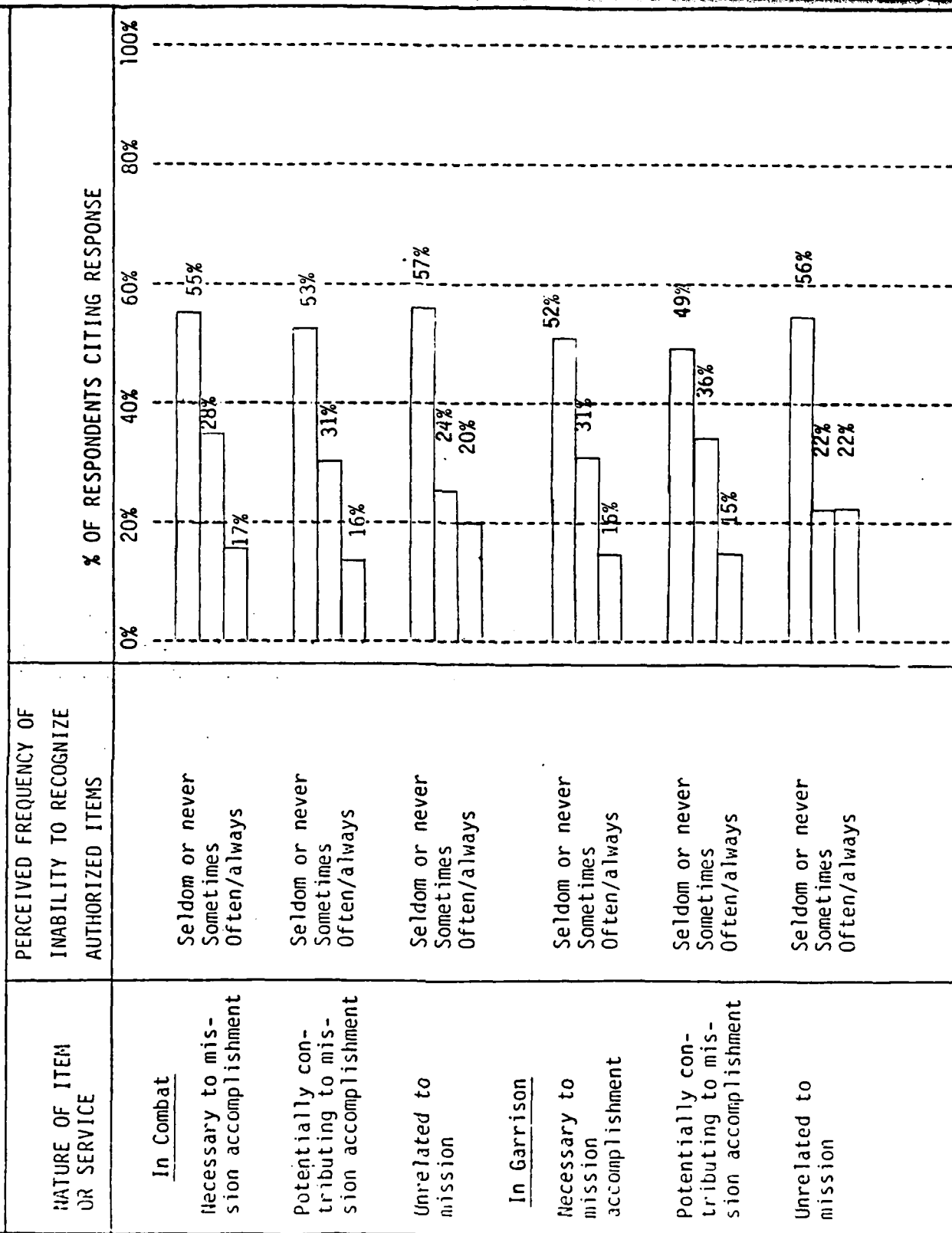


Table 2-4. Question: In your experience, has the logistic system for any reason refused to authorize for issue or requisition by you, your buddies, or your unit any items which you believed were: (as specified below under Nature of Item).

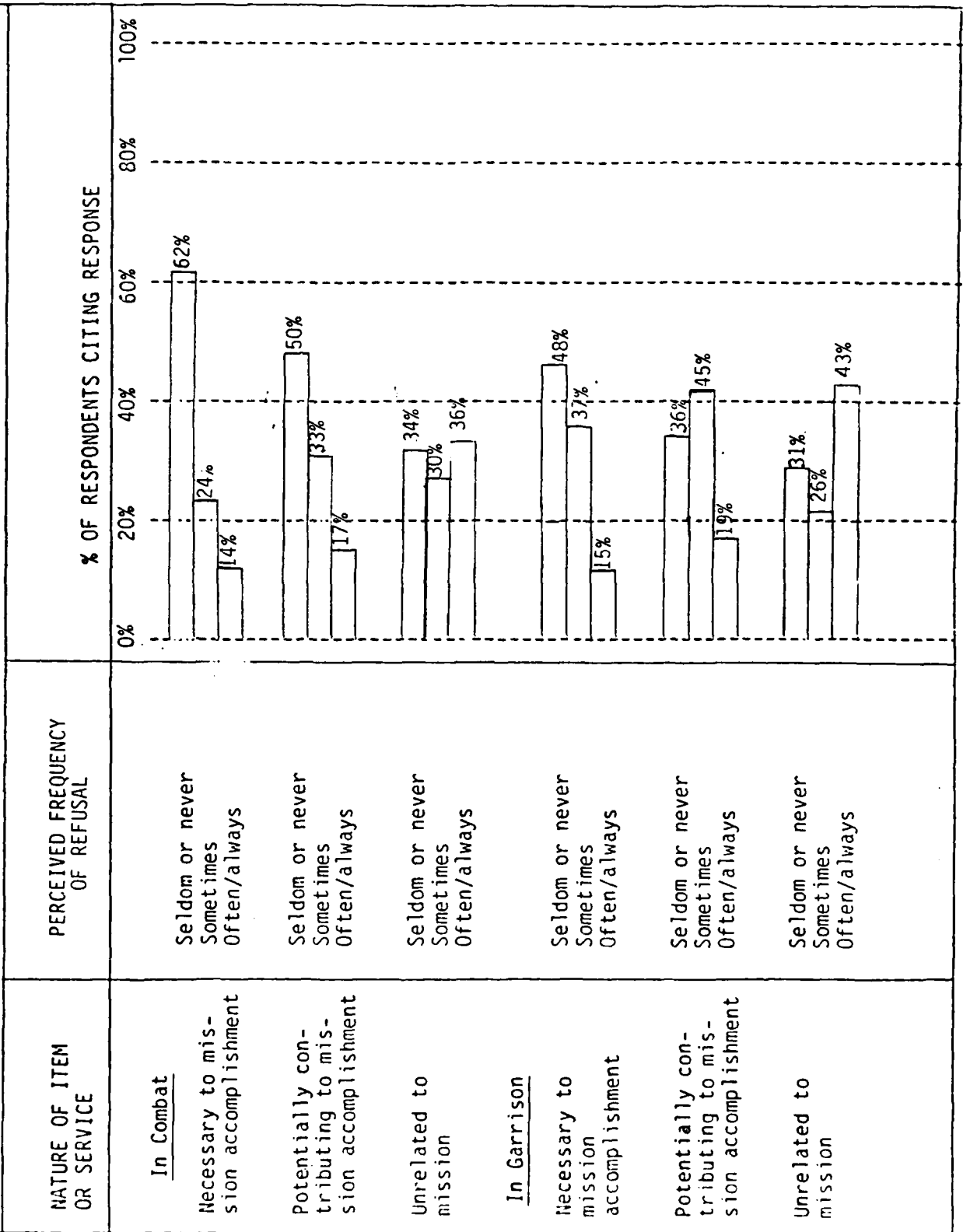
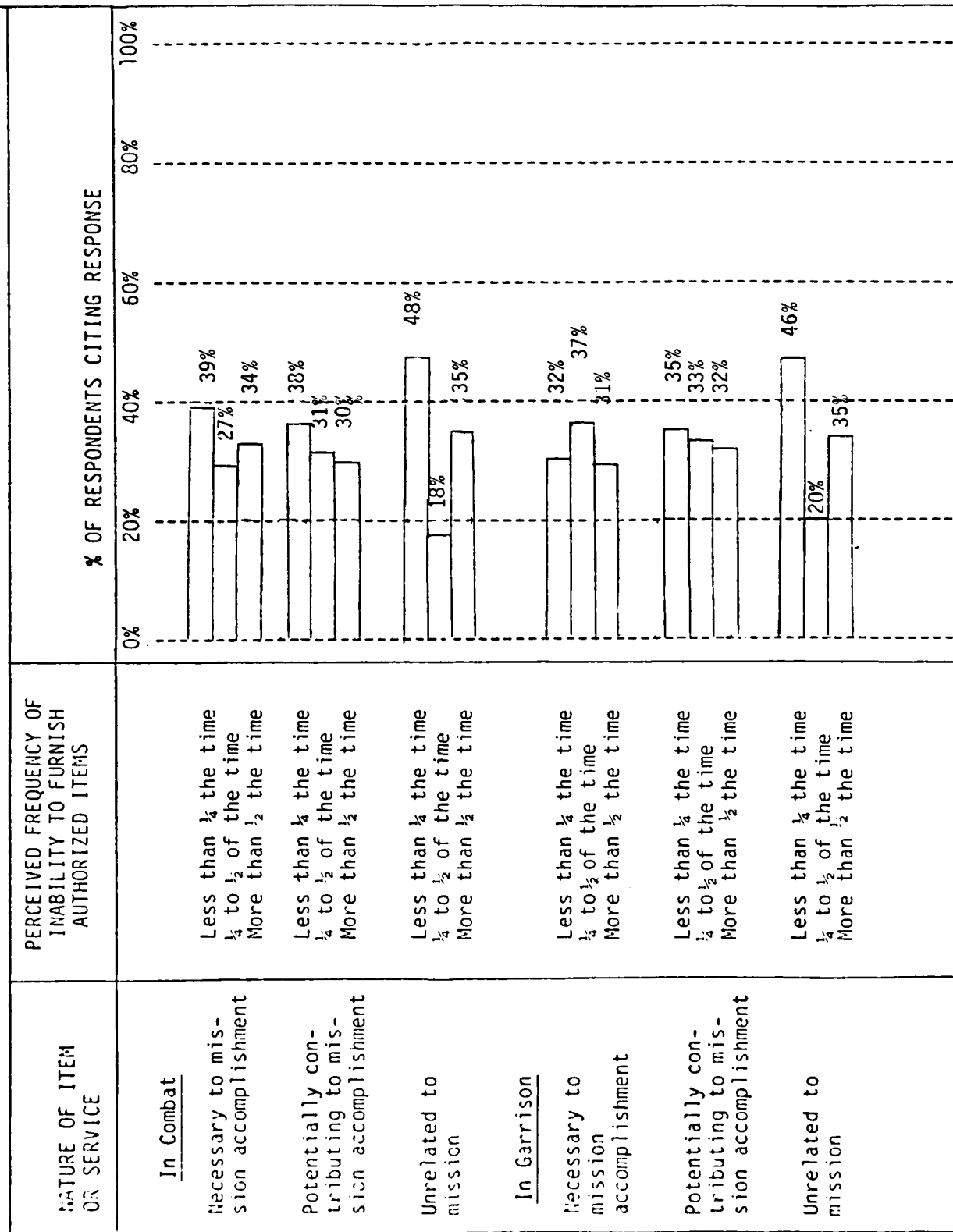


Table 2-5. Question: "How frequently has the logistic system been unable to furnish authorized items when needed for: (as specified below under "Nature of Item")"



- Individuals working a problem can see what is required for it sooner and often more accurately than others remote from the problem.
- Every individual will normally tend to accord to his or her particular task or mission a higher priority than someone with broader responsibilities and tighter resource constraints.

There is unusual diversity among different groups in the response to this question.⁶ These variations are particularly marked for work groups, by rank, by Service, and by career field.

The Army has in almost all circumstances more problems than the Air Force with respect to this question.⁷ Work groups vary widely, but a considerable amount of this difference is due to inter-service differences. The rest of the difference appears to be idiosyncratic among work groups.⁸ With respect to rank:⁹

- Senior NCO's are refused authorization for items less than any other rank in all circumstances in which there is a significant difference, except in garrison, where enlisted men have fewer refusals.
- Officers do well in combat for mission-essential and mission-related items. They do not do well in garrison. Overall, warrant officers have the most problem with being refused authorization for items.

Among career groups, for mission-essential items and for items potentially contributing to the mission under garrison conditions, command personnel have by far the biggest problem with refusals of authorization.¹⁰

⁶For specifics, see Appendix C, Section 4.0, the set of logistic situation variables beginning 1r--; and Appendix D, Sections 2.0, 3.0, 4.0, and 7.0.

⁷Appendix D, Section 7.0.

⁸Appendix D, Section 4.0.

⁹Appendix D, Section 2.0.

¹⁰Appendix D, Section 3.0.

The patterns just described suggest that officer personnel tend to perceive needs for items facilitating mission accomplishment that are denied them (possibly because of budget constraints) except under combat conditions.

Third, the most obvious contributor to the problem of unfulfilled demand appears to be inability of the system to furnish authorized items when needed. The basis for this problem is mentioned in Appendix A in two contexts: Clausewitz' term "the friction of war" - all the things that are unexpected, that go wrong, that change plans in war (after all, the enemy is devoting all his efforts to make it that way); and (for reasons including preservation of mobility, cost effectiveness, and resource budgetary limitations) the inability to fill a significant proportion of demands when they are made. Approximately two thirds of the respondents perceive an inability to furnish items when required more than $\frac{1}{4}$ of the time. There is remarkably little divergence among groups with respect to this question, with supply personnel among career groups, seeing this as a greater problem;¹¹ and with warrant officers and, to a lesser extent officers and senior NCO's, seeing this as a somewhat lesser problem.¹²

2.2.1.1 Related Hypotheses.

Six specific hypotheses were associated with the circumstances which give rise to unsatisfied demands, which may lead to use of irregular logistic procedures. These are presented in Table 2-6 along with the findings based on the preceding discussion.

¹¹Appendix D, Section 3.0

¹²Appendix D, Section 2.0

Table 2-6. Hypotheses concerning the capability and willingness of the military logistic system to fill demands for items

Hypotheses	Findings
1. That among the groupings of individuals surveyed, different groups will reflect differing degrees of difficulty in determining what items are authorized by the logistic system.	1. While technically <u>confirmed</u> in that under some conditions career field groups fulfilled the hypotheses, the lack of confirmation for any other group set makes this a very weak hypothesis, remarkable for the weakness of its confirmation
2. That most individuals surveyed will seldom have difficulty in determining the legitimacy of demands for items necessary to mission accomplishment.	2. <u>Confirmed</u> (by a small margin) See Table 2-3
3. That most individuals surveyed will seldom or never have difficulty in determining the legitimacy of demands for items of no benefit to mission accomplishment.	3. <u>Confirmed</u> (by a small margin) See Table 2-3
4. That most individuals will more often have difficulty in determining the legitimacy of demands for items potentially contributing to mission accomplishment in combat than for other types of demands.	4. <u>Confirmed</u> (by a very small margin). See Table 2-3
5. That most individuals surveyed will at some time have been refused issue of or authorization to requisition items which they felt to be necessary or potentially contributing to mission accomplishment, both in garrison and in combat.	5. <u>Confirmed</u> See Table 2-4
6. That most individuals surveyed feel that the logistic system has been unable to furnish authorized items when needed at least 25% of the time for items necessary or contributing to mission accomplishment both in garrison and combat.	6. <u>Confirmed</u> See Table 2-5

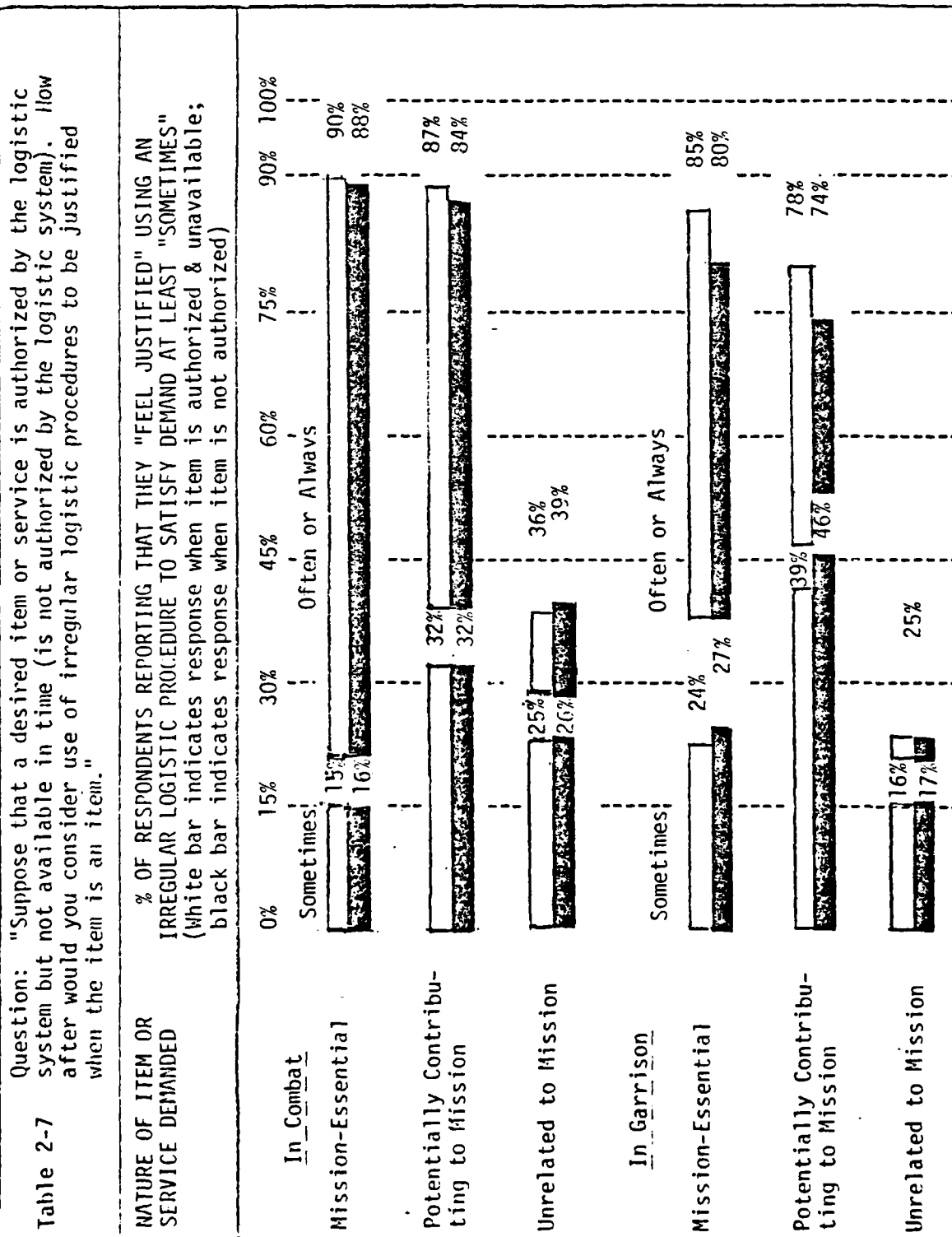
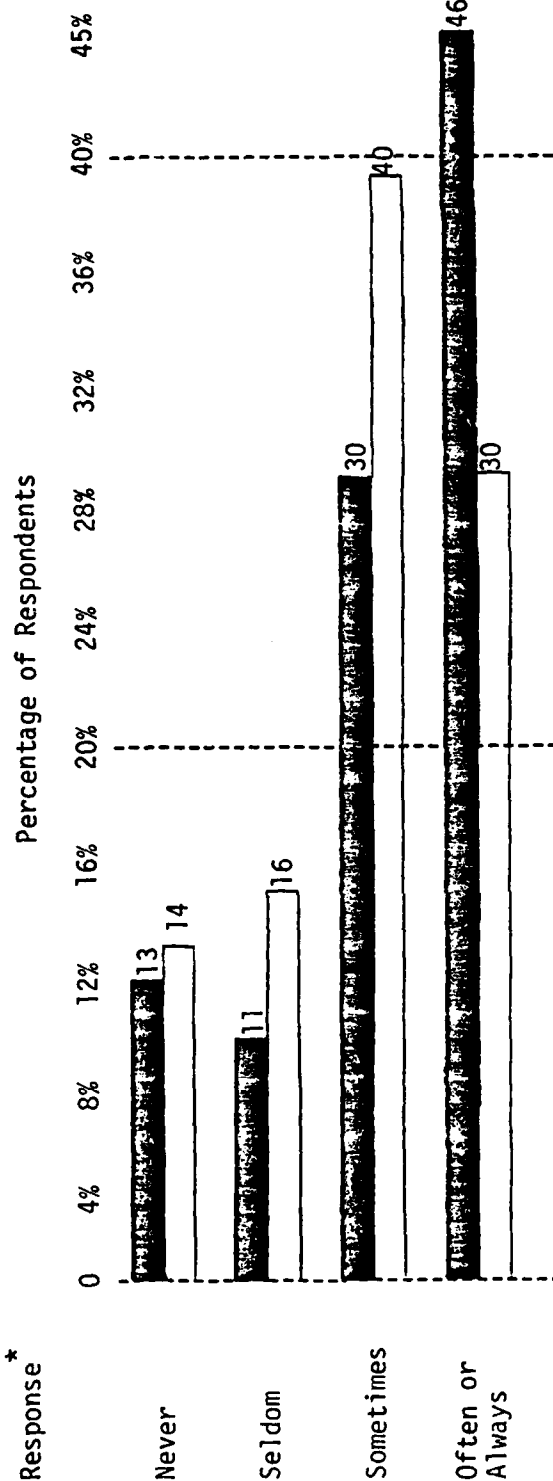


Table 2-8
Response to Question: "How frequently can unauthorized short cuts be used to make helicopter maintenance faster or easier without reducing the quality of the results?"

Response*



* Black bar indicates response under combat conditions; white bar indicates response relevant to garrison conditions.

2.2.2 Is Use of Irregular Logistic Procedures Justified?

This theme involves three question clusters. These are:

If an item or service is authorized but not available, how often are irregular logistic procedures justified to obtain it?

If a desired item or service is not authorized by the logistic system, how often are irregular logistic procedures justified to obtain it?

How frequently can unauthorized short cuts be used to improve helicopter maintenance?

Tables 2-7 and 2-8 present these question clusters with the responses given.

Table 2-7 makes some very obvious, emphatic points. Very few servicemen are concerned about the authorization status of an item or service when considering the use of irregular logistic procedures; generally they consider only its availability and whether it is mission related or not. For mission related items, if they cannot satisfy demands through the system, they feel justified in using irregular logistic procedures, particularly for mission essential items.

When an item is not authorized by the system, there is remarkable unanimity among all groups. Officers and NCO's feel more strongly justified in using irregular logistic procedures than enlisted men for mission essential items.¹³ In addition, for certain types of items under combat conditions there are differences based on degree of job satisfaction.¹⁴

For items authorized but not available in time, there is striking disparity in group viewpoints. Statistically significant differences by job satisfaction category under combat conditions appear for unauthorized items. They do not have clear substantive significance.

¹³Appendix D, Section 2.0

¹⁴Appendix D, Section 6.0

The rank pattern is simple, straightforward, and logical in terms of the motivational findings. Officers and warrant officers under all circumstances are more likely to feel justified in using irregular logistic procedures to obtain unavailable authorized items than NCO's and enlisted men.¹⁵ (In combat for items necessary to mission accomplishment, 95% of the officer and warrant officer respondents feel justified often or always.) In garrison for non-mission related items, however, there is a complete reversal, with 80% or more of officer and warrant officer respondents seldom or never feeling justified in using irregular logistic procedures under these circumstances. Among career groups, command and supply personnel in combat feel more justified in using irregular logistic procedures than maintenance personnel (perhaps reflecting their greater responsibilities for obtaining items).¹⁶ Additionally, for some items in combat, more personnel with combat experience feel justified in the use of irregular logistic procedures than those without combat experience.¹⁷ There were also significant idiosyncratic differences among individual work groups.

With respect to maintenance short cuts, Table 2-8 indicates that about three-fourths of the respondents felt they could be used to make helicopter maintenance faster or easier without reducing the quality of results. Support and headquarters unit work groups were not nearly so positive about this as operating unit work groups.¹⁸

¹⁵Appendix D, Section 2.0

¹⁶Appendix D, Section 3.0

¹⁷Appendix D, Section 3.0

¹⁸Appendix D, Section 4.0

2.2.2.1 Related Hypotheses.

Three specific hypotheses were associated with the perceptions that irregular logistic procedures are justified when needed items cannot be obtained. These are presented in Table 2-9 along with the findings based on the preceding discussion.

2.2.3 Could the Job Get Done Without the Use of Irregular Logistic Procedures?

This theme involves a single question cluster:

If individuals in your current position never used any irregular logistic procedures, how well could they do the job?

The answer to this theme is clear from Table 2-10, which speaks rather strongly to the need for use of irregular logistic procedures, particularly in combat. There is some difference among group sets on this. The Air Force, for garrison conditions and parts and supplies, by a small majority felt it could operate adequately or very well without using irregular logistic procedures. Two-thirds of the Army respondents felt they could operate poorly or not at all under these conditions.¹⁹ This may reflect, among other things, the elite status of the Air Rescue Service.²⁰ On the same question, among the career fields, the maintenance and command career fields by an almost two-thirds majority felt they could not adequately obtain parts and supplies in garrison without some use of irregular logistic procedures; supply personnel held the opposite position by a smaller majority.²¹ Work groups for both garrison and combat held quite different views which appeared in most cases idiosyncratic rather than related to the unit function.²²

¹⁹Appendix D, Section 4.0

²⁰The Air Rescue Service, which contains the bulk of Air Force helicopters, is an elite group, and it was from this group that the study sample was taken.

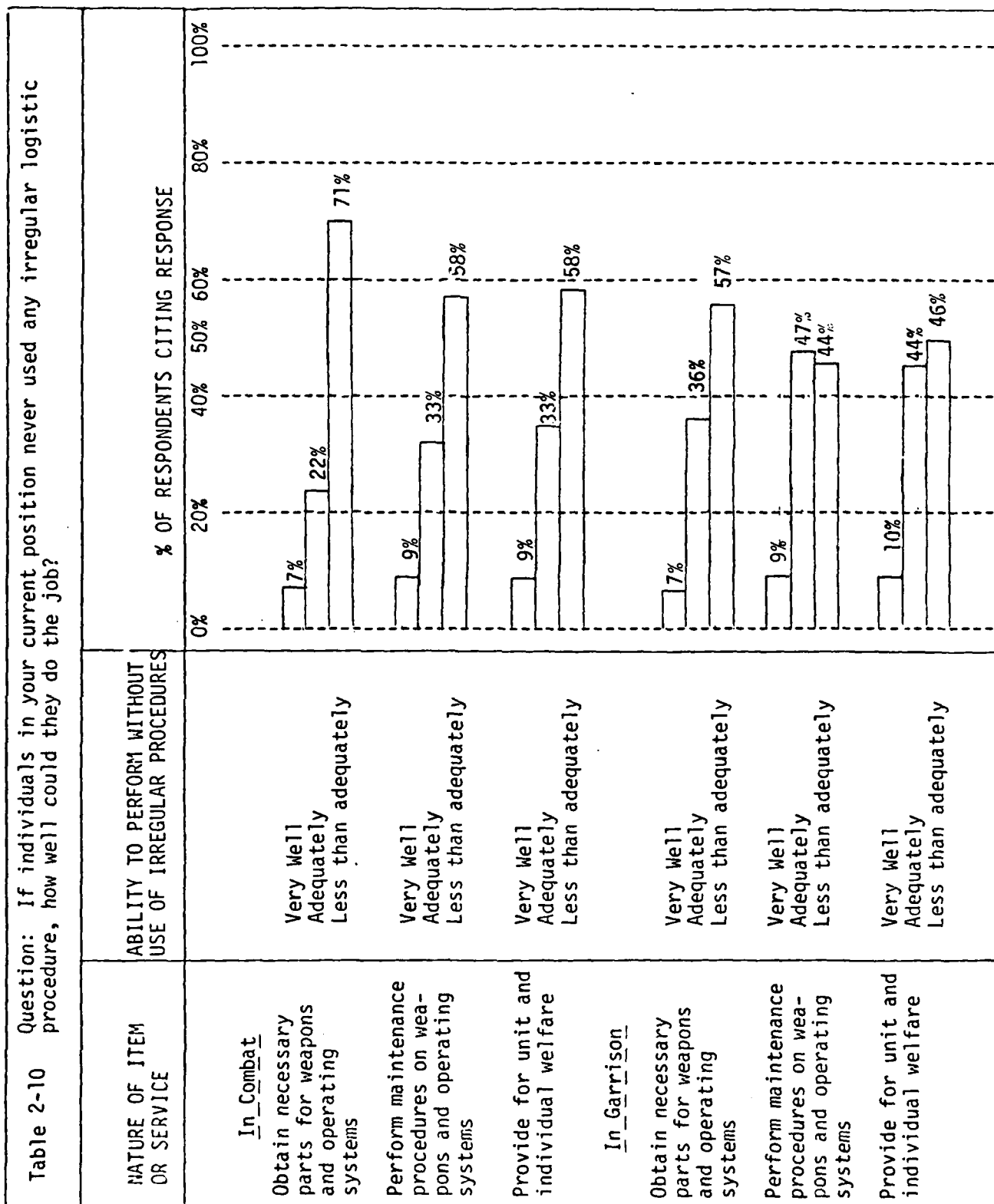
²¹Appendix D, Section 3.0

²²Appendix D, Section 4.0

Table 2-9

Hypotheses Concerning Respondent Perceptions of Justifications
for
the Use of Irregular logistic Procedures

Hypotheses	Findings
1. That most individuals surveyed feel justified in using irregular procedures in combat either always or often when the logistic system is unable to deliver a needed and <u>authorized</u> item by the time it is needed.	<u>Confirmed.</u> See Table 2-7. However, the hypothesis should be broadened by deleting the word "authorized" and changing "necessary to" to "related to".
2. That most individuals feel that, in garrison, they are justified in using irregular logistic procedures at least sometimes when the logistic system is unable to deliver an <u>unauthorized</u> item by the time it is needed.	<u>Partially Confirmed.</u> See Table 2-7. Confirmed only for mission related items. However, the hypothesis should be broadened by deleting the word "unauthorized".
3. That individuals surveyed will feel that unauthorized short cuts can be used less often in garrison than in combat to make helicopter maintenance faster or easier without reducing the quality of the results.	<u>Confirmed,</u> although not by a large margin. See Table 2-8.



2.2.3.1 Related Hypotheses.

Two specific hypotheses were associated with the perceptions as to whether the respondents could get the job done without the use of irregular logistic procedures. These are presented in Table 2-11 along with the findings based on the preceding discussions.

2.2.4 At Whose Instigation do Irregular Procedures Occur?

This theme involves a single question cluster:

- When an individual in your position uses irregular logistic procedures, how often will it be in response to (several alternatives provided).

Table 2-12 presents this question cluster with the response given. The pattern of responses indicates that the individual's military superiors, others outside the chain of command, and his own initiative all make significant contributions in initiating use of irregular logistic procedures; with military superiors and own initiative making the greater contributions. There is no significant disagreement on this question among groups in garrison. There are seven instances of disagreement in combat from three group sets. The Air Force indicates somewhat less frequency than the Army for initiation of irregular logistic procedures at the instigation of other individuals outside the chain of command or on one's own in combat.²³ Among work groups, two of those from operating helicopter units (one from each service) indicated a markedly stronger influence of other individuals and personal initiative in initiating use of irregular logistic procedure.²⁴

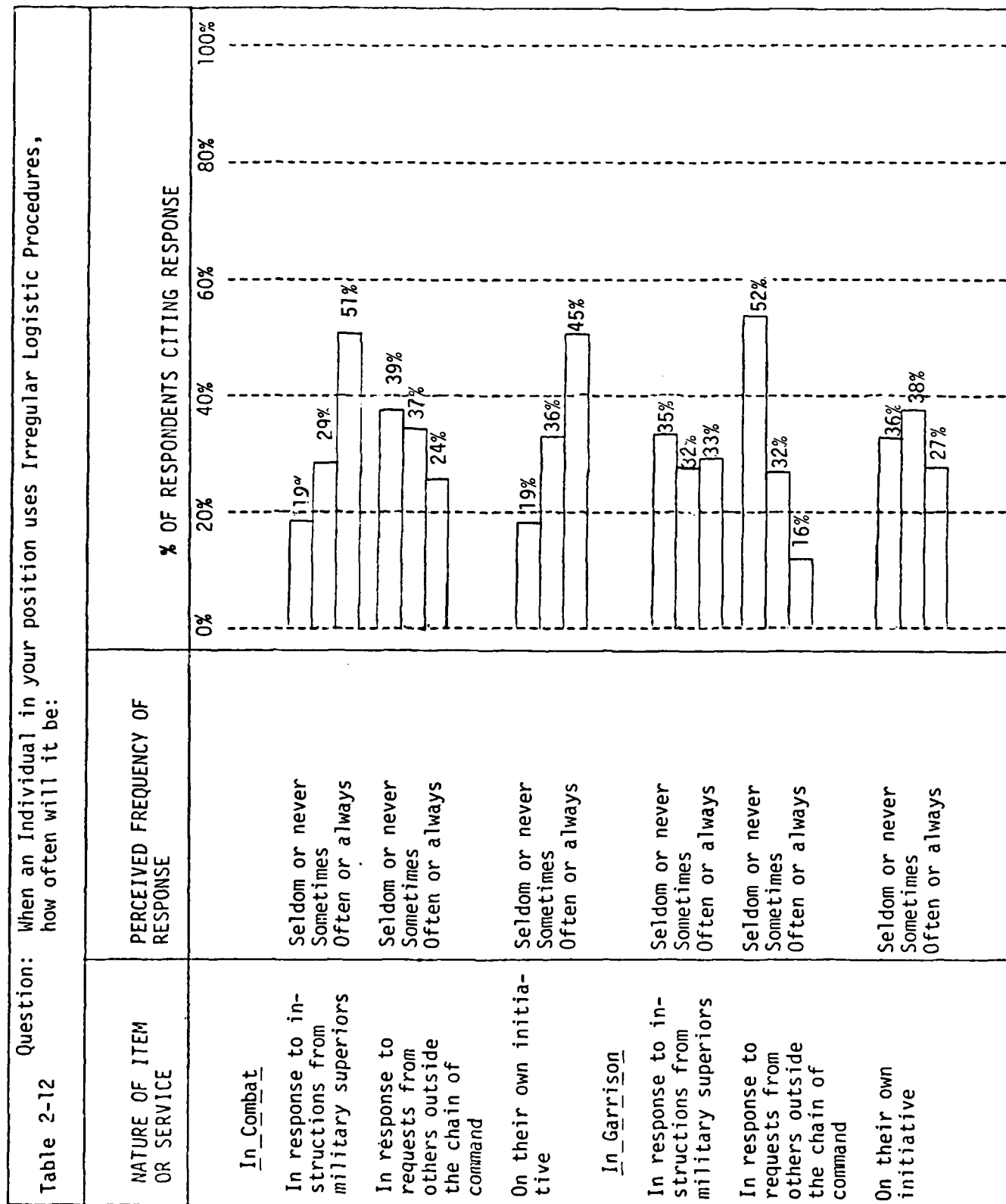
²³Appendix B, Section 7.0

²⁴Appendix D, Section 4.0

Table 2-11

Hypotheses Concerning Respondent Perceptions of Justifications
for
the Use of Irregular Logistic Procedures

Hypotheses	Findings
There will be a consensus that if they never used irregular logistic procedures, personnel in combat would be able to perform their duties less than adequately. There will be a consensus that if they never used irregular logistic procedures, personnel in garrison would be able to perform their duties less than adequately.	<u>Confirmed.</u> See Table 2-10. <u>Confirmed</u> for obtaining necessary parts for weapons and operating systems. <u>Disconfirmed</u> for performance of maintenance procedures on weapons and operating system, and for providing for unit and individual welfare. See Table 2-10.



This suggests this theme is an individual unit oriented one. Individuals with combat experience indicated a greater stimulus from all three sources: superiors, others, and own initiative.²⁵ Although technically illogical, this response practically is taken as a reflection of the phenomenon reflected in paragraph 2.2.2 and elsewhere concerning justification of use of irregular logistic procedures: individuals with combat experience feel a greater need for use of irregular logistic procedures, particularly in combat.

2.2.4.1 Related Hypotheses.

Two specific hypotheses were associated with the instigation to use irregular logistic procedures. These are presented in Table 2-13 along with the findings based on the preceding discussion.

2.2.5 What are the Consequences to Individuals Who Use Irregular Logistic Procedures?

- When individuals in your position use irregular logistic procedures without being told to do so by their military superiors, how often do their superiors find out that such procedures have been used?
- When individuals in your position use irregular logistic procedures without being told to do so by their military superiors and their superiors find out, what would you expect their superiors to do?
- When an individual uses an irregular logistic procedure in response to instructions from military superiors, does responsibility for any resulting violation of the law or regulations lie with the individual or with the military superiors?

Tables 2-14 through 2-16 present these question clusters with the responses given. From Tables 2-14 and 2-15 it is clear that:

- Approximately one-third of the respondents felt that superiors will often know of the use of irregular logistic procedures, except in the case of those involving items or services of no benefit to mission

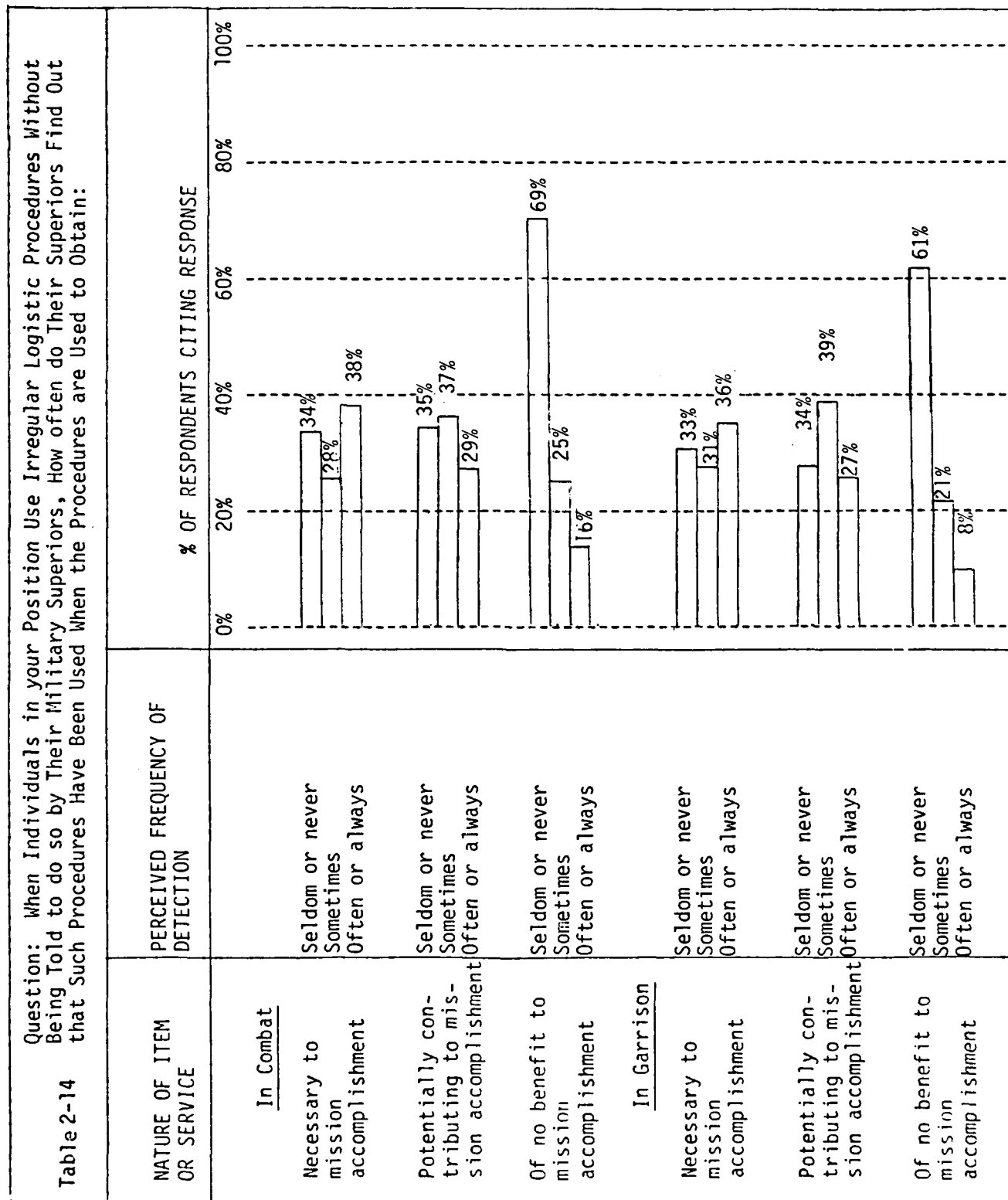
²⁵Appendix D, Section 5.0

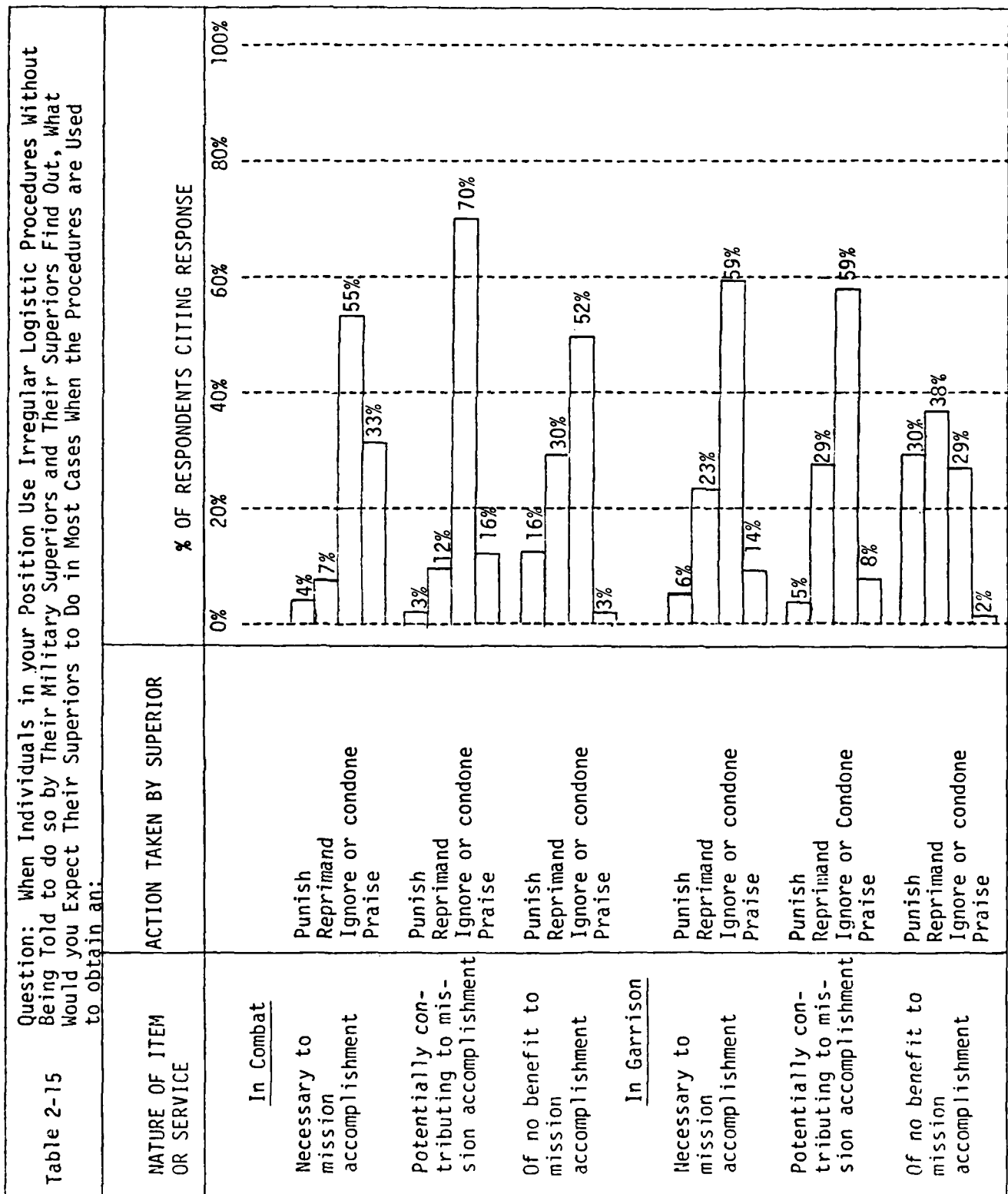
Table 2-13

Hypotheses Concerning the Instigation of Irregular Procedures

Hypotheses	Findings
1. When mechanics use irregular logistic procedures, it will often have been in response to instructions from their military superiors. 2. When mechanics use irregular logistic procedures, it will seldom be on their own initiative or in response to requests from outside the chain of command.	<u>Partially Confirmed.</u> Marginals by rank (enlisted men) and by career field (maintenance) indicate 33 to 50% of the time it will be "often" or "always". This is considered partial confirmation. <u>Partially Confirmed.</u> Marginals by ranks (enlisted men) and by career field (maintenance) indicate 26 to 42% of the time it will be "often" or "always". This is considered partial confirmation.

Question: When Individuals in your Position Use Irregular Logistic Procedures Without Being Told to do so by Their Military Superiors, How often do Their Superiors Find Out that Such Procedures Have Been Used When the Procedures are Used to Obtain:





accomplishment. This category would include use of irregular procedures for personal gain. Based on Table 2-15 and findings in section 3, there would be a strong presumption that individuals using irregular logistic procedures for this type incentive would consider it prudent to hide his actions, whereas individuals using irregular logistic procedures for mission oriented purposes would tend not to consider it worthwhile to make the effort to conceal their actions, indeed, in some cases might want to advertise them.

- The expected consequences of being discovered using irregular logistic procedures are quite situation dependent, being on balance favorable for items or services necessary to mission accomplishment in combat, quite likely rather unfavorable for items of no benefit to mission accomplishment in garrison.

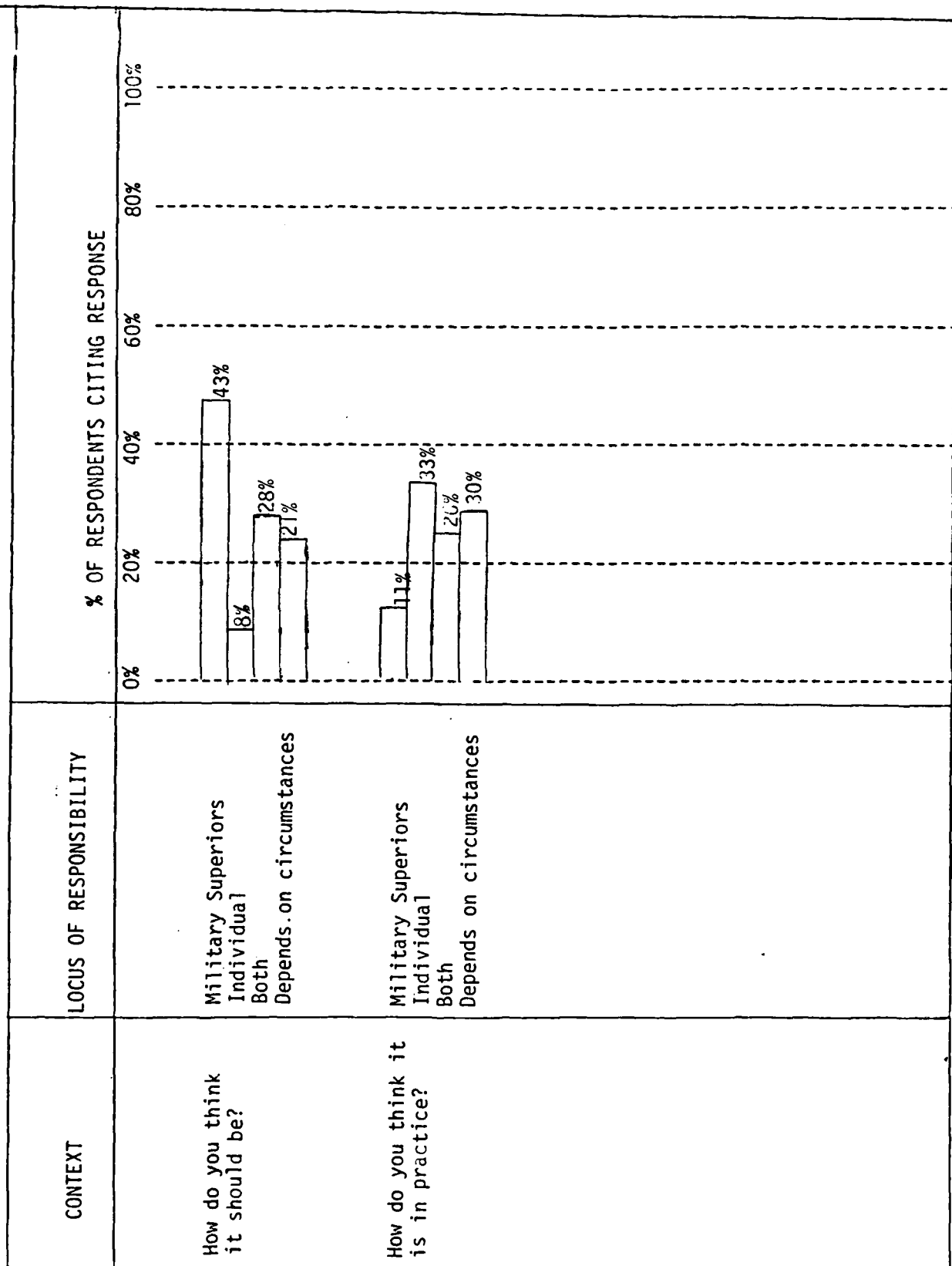
Table 2-15 suggests that between one-fourth to one-third of the respondents tended to feel that responsibility for use of irregular logistic procedures is unfairly transferred from military superior to the individual. This could be a considerable disincentive for use of irregular logistic procedures for the subordinates in that group of respondents. There are no statistically significant differences between groups in any group set taken as a whole with respect to this question cluster. The one group that exhibited a substantially different perception was warrant officers, two-thirds of whom responded that in practice the individual was held responsible (vs. 33% for the sample as a whole, Table 2-16).

With respect to group differences for the other two question clusters, there were only two such differences with respect to likelihood of discovery, but 13 for the consequences of discovery. With respect to likelihood of discovery, there was considerable, apparently idiosyncratic variation among work groups with respect to mission related items.²⁶ The same type work group divergence exists for items or services necessary to mission accomplishment with respect to consequences of discovery.²⁷ Combat

²⁶Appendix D, Section 4.0

²⁷Appendix D, Section 4.0

Table 2-16 Question: When an Individual Uses an Irregular Logistic Procedure in Response to Instructions from Military Superiors, Does Responsibility for Any Resulting Violation of the Law or Regulations Lie with the Individual or with the Military Superiors?



veterans in all circumstances feel that the consequences of discovery in combat would be significantly more favorable (less unfavorable in the case of items or services of no benefit to the unit mission) than personnel without combat experience.²⁸ With respect to ranks:

- In garrison, for mission related items, significantly more senior NCO's (followed by enlisted men) expect severe consequences from discovery than junior NCO's, officers, and warrant officers.
- In combat, for mission related items, officers and warrant officers tend to expect least severe/most favorable results from discovery; followed by NCO's.
- In combat for items of no benefit to mission accomplishment, senior NCO's expect less severe consequences of discovery to a much greater degree than any other group.²⁹ This is an interesting statistic in view of the senior NCO incidents involving use of irregular procedures for personal gain which came to light about 1970.³⁰

Command personnel expected less severe/more favorable results from discovery, followed by supply personnel.³¹ With respect to job satisfaction, two weak trends were observed, neither appearing substantively significant.³²

2.2.5.1 Related Hypotheses.

Five specific hypotheses were associated with the consequences to individuals of use of irregular logistic procedures. These are presented in Table 2-17 along with the findings based on the preceding discussion.

²⁸Appendix D, Section 5.0

²⁹Appendix D, Section 2.0

³⁰Sgt. Maj. Woolridge and others.

³¹Appendix D, Section 3.0

³²Appendix D, Section 6.0

Table 2-17

Hypotheses Concerning The Instigation of Irregular Procedures

Hypotheses	Findings
1. That when individuals use irregular logistic procedures without being told to do so by their superiors, in both combat and garrison they will perceive that their superiors will almost always know that they have done so.	<u>Disconfirmed.</u> Table 2-14 shows that they expect their superiors will seldom or never know from 33% to 69% of the time.
2. That for items necessary or contributing to mission accomplishment, when individuals use irregular logistic procedures in combat without being told to do so by their superiors and their superiors are aware of it, the superiors will normally condone the act and will in many cases praise them for it.	<u>Partially Confirmed.</u> As shown in Appendix C, Section 2.0, Question 38, 60% of respondents for necessary items and 48% of respondents for potentially contributing items perceived that their superiors would praise or condone their acts.
3. That for items necessary or contributing to mission accomplishment, when individuals use irregular logistic procedures in garrison without being told to do so by their superiors and their superiors are aware of it, the superiors, will either ignore or condone the act.	<u>Partially Confirmed.</u> Table 2-15 indicates this to be true the majority (59%) of the time.
4. That when an individual uses an irregular logistic procedure in response to instructions from military superiors groupings by rank of the individuals surveyed will differ in terms of where they think responsibility is placed in practice.	<u>Results Inconclusive.</u> Although there were not statistically significant differences for the rank group set as a whole, approximately twice as many warrant officers as other ranks felt the individual was held responsible (paragraph 2.2.5).

(Continued on next page)

Table 2-17 (Continued)

Hypotheses Concerning The Instigation of Irregular Procedures

Hypotheses	Findings
5. That most individuals surveyed (for all ranks) will feel that when an individual uses irregular logistic procedures in response to instructions from military superiors, the responsibility should reside with the military superior.	Disconfirmed. While a significant plurality of individuals felt the military superiors, most did not.

2.3 TYPES OF IRREGULAR LOGISTIC PROCEDURES

The preceding paragraphs have documented the widespread perception that irregular logistic procedures are needed, justified, and condoned to varying degrees under varying circumstances. The next question is, what kinds of irregular logistic procedures are involved? Table 2-18 lists 15 procedures for which respondents were requested to indicate whether they were helpful, harmful, or neither. Based on the responses, these types of irregular logistic procedures can be broken down into four functional categories, based primarily on whether on balance they are perceived as harmful or helpful in garrison and in combat. Note that all but Category I types are perceived as helpful in combat by almost one out of four individuals, enough to make their use likely.

Factor analysis produced a different categorization of the types of procedures with an apparent normative context (Table 2-19). There are two principal categories developed: Category A comprises types of irregular logistic procedures reflecting relatively benign transgressions of regulations; Category B reflects more serious breaches, normally with some implication of either ethical or criminal nature. The normative categories coincide imperfectly with the functional categories. For

example, unauthorized use of equipment with maintenance deficiencies is perceived as relatively benign in normative terms (Category A); but it is one of the more functionally harmful practices (Category II). It is suggested that these categories provide a rough guide for possible action to improve the benefits received from and reduce the harm done by the use of irregular logistic procedures (Table 2-20).

2.3.1 Group Differences

There are 37 statistically significant group differences with respect to harmfulness/helpfulness of different types of irregular logistic procedures, after elimination of several service differences due to sample composition. These were tabulated in Table 2-2 and involved two levels of intensity: ranks and combat experience at 9 and 10 differences respectively; and the other four group sets at 4 to 5 differences each. The rank differences³³ may be summarized as follows:

- Procedures generally perceived less frequently as harmful in garrison by enlisted men (E1-4)
 - Taking items without authority
 - Unauthorized cannibalization
 - Theft of military items (warrant officers joined the enlisted men for this procedure)
- Procedures generally perceived more frequently as helpful/less frequently harmful by officers and warrant officers
 - Use of unauthorized maintenance procedures, including unauthorized levels of maintenance (combat and garrison) ("helpful" ratings of 65-75% in combat)
 - Obtaining items or services from unauthorized sources (combat and garrison) (helpful ratings of 65-78% in combat, where they were joined by senior NCOS).
 - Use of personnel for unauthorized purposes (garrison)

³³ Appendix D, Section 2.0

- Use of gifts or favors, such as liquor rations, to facilitate irregular procedures.

Combat veterans felt all of the following types of items to be more helpful/less harmful in combat than personnel who had not been in combat:

- All Category A items (Table 2-19) except unauthorized exchanges of items
- The following Category B items:
 - unauthorized cannibalization
 - use of gifts or favors to facilitate irregular procedures

Combat veterans also felt taking items without authority to be more helpful (20% vs. 10%) in garrison.³

The Services disagreed in five instances:³⁵

- On balance, more Army respondents felt that unauthorized fabrication of parts (combat and garrison) is harmful than Air Force respondents
- On balance, more Air Force respondents felt the following procedures are harmful than Army respondents:
 - Use of bribes to obtain supplies (combat)
 - Use of gifts or favors (combat and garrison)³⁶

Career fields disagreed in four instances:³⁷

- On balance more supply personnel felt unauthorized stockpiling in garrison and combat more harmful than did maintenance and command personnel

³¹ Appendix D, Section 5.0

³² Appendix D, Section 7.0

³⁵ Note that the imbalance in the Service supply situation noted by General Scott (Appendix A, page A-9) could provide a basis for the Army finding greater utility in these two procedures in Vietnam than the Air Force.

³⁷ Appendix D, Section 3.0

Table 2-18 Irregular Logistic Procedures in Order of % of Respondents Viewing the Procedure As Having Harmful/
Helpful Impact on Unit Effectiveness.

TYPE OF IRREGULAR PROCEDURE	in Garrison		in Combat		Functional Category
	Harmful	Helpful	Harmful	Helpful	
Theft of military items	88	4	8	8	Cat. I Overwhelmingly harmful always
Falsification of documents	82	8	10	12	Cat. II Net harmful both in combat and in garrison, but much less so in combat.
Unauthorized use of equipment with maintenance deficiencies	79	10	12	18	
Unauthorized cannibalization	79	14	8	11	
Taking items without authority	76	13	11	11	
Intentionally submitting incorrect documents	68	14	18	10	
Use of authorized items or services for unauthorized purposes	66	11	23	19	
Use of gifts to obtain items	62	15	23	13	
Use of bribery	62	17	21	17	Cat. III Net harmful but at least 20% helpful in combat.
Use of personnel for unauthorized purposes	61	17	22	21	
Use of unauthorized maintenance procedures	61	21	18	12	
Unauthorized fabrication of parts	58	28	15	16	
Unauthorized exchanges of items	47	29	24	19	Cat. IV Always net helpful
Obtaining items or services from unauthorized sources	45	32	23	17	
Unauthorized stockpiling of items	37	48	15	10	

2-36

* Values may differ from Appendix C and may not add to 100% due to rounding.

Table 2-19.

Apparent Normative Categorization of Unauthorized Procedures
Obtained by Factor Analysis

Category A: *Minor-to-moderate rule breaking, no significant injury to others, no significant moral/criminal implications.*

- A.a¹ • Unauthorized Stockpiling of Items
- A.b² • Obtaining Items or Services from Unauthorized Sources
- Unauthorized Exchanges of Items
- Unauthorized Fabrication of Parts
- Use of Unauthorized Maintenance Procedures
- Use of Personnel for Unauthorized Purposes
- Use of Authorized Items or Services for Unauthorized Purposes
- Use of Equipment with Maintenance Deficiencies

Category B: *Moderate-to-severe rule breaking, possibility of injury to others, moral/criminal implications.*

- B.a³ • Use of Gifts or Favors to Obtain Items
- Use of Bribery
- Falsification of Documents
- B.b³ • Taking Items Without Authority
- Unauthorized Cannibalization
- B.c⁴ • Intentionally Submitting Incorrect Documents
- Theft of Military Items

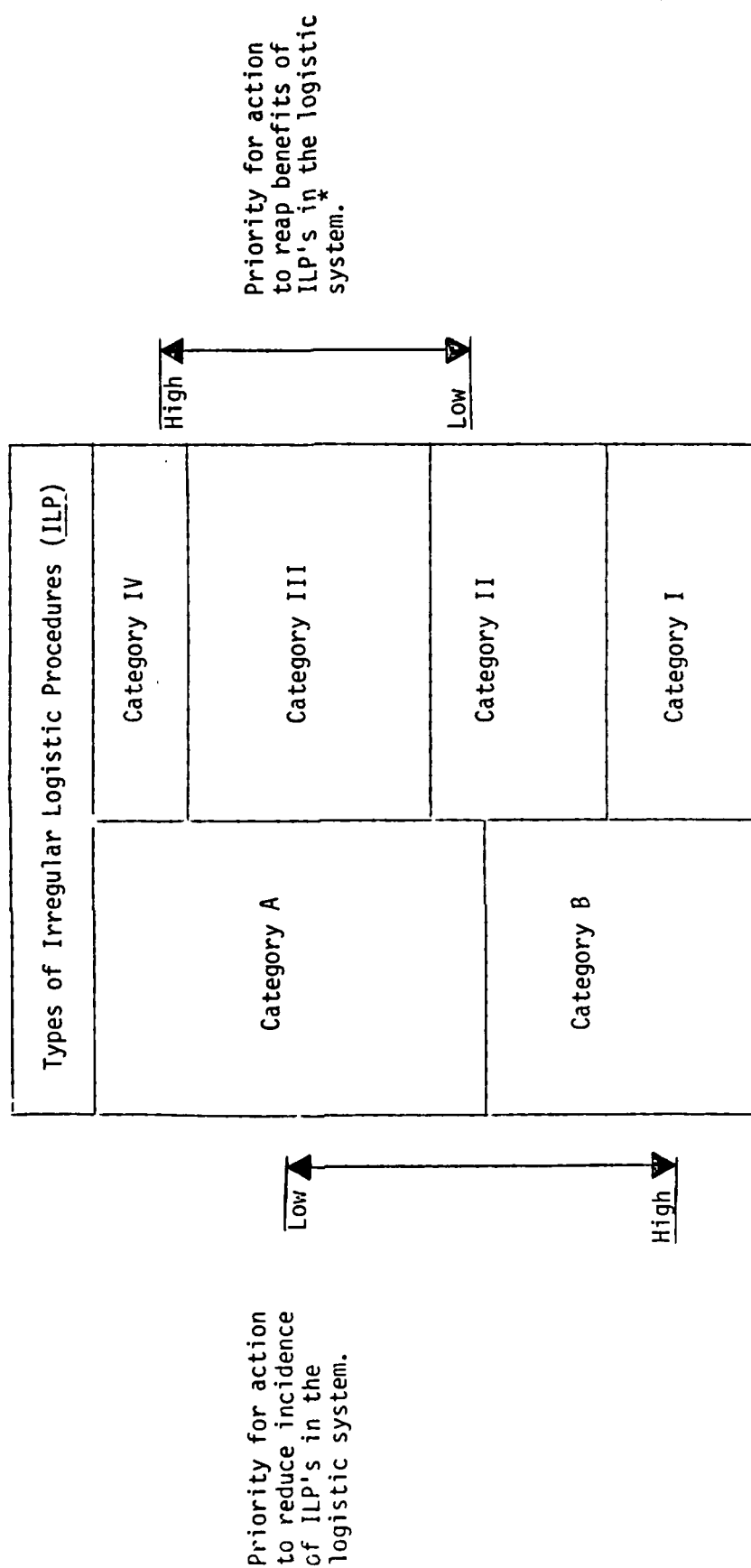
¹This procedure did not load on any factor in garrison or combat.

²These procedures all loaded on one factor in garrison and combat.

³These procedures all loaded on one factor in combat. In garrison, they split into the two groups indicated, each group loading on a separate factor.

⁴These procedures loaded on their own separate factor in combat. In garrison, theft loaded with the B.b procedures; intentionally submitting incorrect documents did not load on any factor.

Table 2-20 Use of Categories of Irregular Logistic Procedures as a Rough Guide for Actions to Improve Benefits Received from Them and Reduce Harm Done by Them



* i.e., to enhance helpful aspects, reduce harmful aspects (some suggestions are made in Section 4), and generally try to harness rather than eliminate).

- All command personnel viewed theft in garrison to be harmful, and more maintenance than supply personnel viewed it as harmful.
- More command personnel viewed unauthorized exchanges or use of items to be helpful than personnel in the other two groups.

Work groups generally displayed an idiosyncratic pattern of differences with respect to five types of irregular logistic procedures.³⁸ Personnel dissatisfied with their career also showed somewhat different patterns than other personnel for a few procedures.³⁹

2.3.2 Related Hypotheses

Four specific hypotheses were associated with the perceptions of specific types of irregular procedures. These are presented in Table 2-21 along with findings based on the preceding discussion.

³⁸Appendix D, Section 4.0

³⁹Appendix D, Section 6.0

Table 2-21

Hypotheses Concerning the Types of Irregular Procedures

Hypotheses	Findings
1. That of the irregular logistic procedures considered in this study, some will be considered helpful to unit effectiveness.	<u>Confirmed.</u> See Table 2-18, Category III and IV procedures.
2. That among the groupings of individuals surveyed, (e.g. differentiated by rank, type of job, or degree of job satisfaction) there will be different patterns of irregular procedures considered helpful and irregular procedures considered harmful to unit effectiveness.	<u>Confirmed.</u> In spades. See paragraph 2.3.1.
3. More types of irregular procedures will be considered helpful under combat conditions than under garrison conditions.	<u>Confirmed.</u> See Table 2-18. All Category III procedures are net helpful in combat, not in garrison.
4. Fewer types of irregular logistic procedures will be considered harmful under combat conditions than under garrison conditions.	<u>Confirmed.</u> Same as for 3 above.

SECTION 3

DATA ANALYSIS: THE MOTIVATIONAL CONTEXT

SECTION 3

DATA ANALYSIS: THE MOTIVATIONAL CONTEXT

3.0 GENERAL

This section presents the findings of the field survey in the context of incentive structure and decision models cited in Section 1, and in terms of motivational context of irregular logistic procedures in military helicopter units. As noted in Section 1, the motivational context includes three elements: work group norms affecting the use of irregular logistic procedures, incentives tending to promote the use of irregular logistic procedures under specific demand conditions, the disincentives tending to inhibit the use of irregular logistic procedures under specific demand conditions.

3.1 WORK GROUP NORMS

Perceptions of work group norms differ considerably between work groups under peacetime, garrison conditions and work groups under combat conditions. Garrison conditions are discussed first, then combat conditions (with comparisons where appropriate). Hypothesis validation is covered for both groups at the end of this subsection.

3.1.1 Garrison Conditions

The survey asked respondents to indicate whether their work groups encouraged, discouraged, or were neutral on eighteen possible work norms. The application of factor analysis to be responses relevant to garrison conditions revealed that, in the

perceptions of the respondents, these norms could be divided among five categories: ¹

- Duty norms: a high skill level on the job, a strong sense of motivation and esprit, teamwork, fostering of group welfare, a strong sense of duty, and giving top priority to flight safety.
- Avoidance of work and use of irregular procedures which reduce flight safety.
- Compliance with wishes of well-liked/highly respected superiors.
- Compliance with wishes of strongly disliked superiors and superiors who have no earned respect.
- Use of irregular procedures: to insure mission accomplishment, get the job done faster, improve work group prestige, and improve group living conditions.

In addition, two norms were not perceived as related to any of the above norms: following regulations without question at all times, and following regulations only when they appear reasonable.

Table 3-1 summarizes the responses by these categories of questions for garrison conditions.² Of particular interest are:

- The strong encouragement for duty norms and complying with wishes of well-liked/respected superiors. This latter factor is of particular interest because of the tendency for senior personnel (i.e., superiors) to give responses conducive to the use of irregular logistics cited on several occasions in Section 2.
- Avoidance of work. Intended to reflect avoidance of unnecessary administrative effort in getting the job done, various group set and incentive response patterns suggest it may have been read two ways: in the intended sense, and in the context of "goofing off."
- Examination of the results indicates that at least some of the respondents who reported that their work groups

¹ Based on factor loading on common factors of .500 or greater.

² Appendix C, Section 2.0, provides detailed responses.

Table 3-1. Overall Perceptions of Work Group Norms Under Garrison Conditions

Work Group Norm Type	Average % Reporting Norm is Encouraged	Average % Reporting Norm is Discouraged	Average % Reporting Norm is Neither Encouraged Nor Discouraged
Duty Norms	75	6	20
Compliance With Wishes of Well-liked/Respected Superiors	78	6	16
Compliance With Wishes of Disliked/Not Respected Superiors	35	31	34
Avoidance of Work and Use of Procedures Which Reduce Flight Safety	16	69	15
Use of Irregular Procedures	54	22	25
Following Regulations Without Question	61	13	26
Following Only Reasonable Regulations	52	19	29

encouraged following regulations without question at all times also reported that their work groups encouraged the use of irregular procedures to insure mission accomplishment, to get the job done faster, to improve work group prestige, and to improve group living conditions. This, plus the existence of norms for which group influences for and against are relatively balanced, emphasizes that with respect to some norms a work group may constitute a highly conflictual environment.

3.1.1.1 Group Differences

There are 37 instances of statistically significant group differences for group norms in garrison, just over 2 per norm, the most for any set of questions. The bulk of these are differences by rank (12) and by combat experience (11). In differences by rank:³

- Duty norms (4 of the 6). For these, enlisted men reflected significantly lower net levels of encouragement than officers, warrant officers, and NCO's. Senior NCO's were highest of all (except for giving top priority to flight safety), by a wide margin for motivation and esprit, and for a strong sense of duty³.
- Use of irregular logistics norms. For two of these (to ensure the mission gets accomplished, and to get the job done faster) officers and warrant officers reflect a much higher (on the order of 35-40% differential) net level of encouragement by their work groups compared to enlisted men and NCO's.
- Compliance with wishes of superiors. Officers, warrant officers, and senior NCO's reflect greater encouragement of compliance for well-liked or respected superiors. For disliked superiors, or superiors who have not earned respect, these three groups again report significantly more encouragement for compliance, with warrant officers noticeably above officers and top NCO's.

³ For details, see Appendix D, Section 2.0

- Avoidance of work. Officer/warrant officer perceptions of work groups were most negative on this subject; enlisted ones, most positive.
- Following regulations without question. Senior NCO's and warrant officers were much more positive on this subject, on balance, than the other groups.

Combat experienced personnel reflected the following differences from those without combat experience:⁴

- For all duty norms, combat experienced personnel reported greater group encouragement than non-combat personnel.
- For compliance with superiors respected or not, they reported greater group encouragement of compliance with their wishes.
- For following regulations without question, and for use of irregular procedures to improve group living conditions, combat veterans report significantly more encouragement by their work groups.

Between Services, the Army reflected significantly greater work group encouragement for three norms:⁵ (1) avoidance of work, and use of irregular procedures to (2) improve work group prestige and (3) improve group living conditions. Among work groups, the same three norms showed significant differences, reflecting the Service differences superimposed on a pattern that was otherwise idiosyncratic, except that the headquarters work group showed the most net encouragement of all three norms.⁶

Two patterns were associated with job satisfaction differences:⁷

⁴ Appendix D, Section 5.0

⁵ Appendix D, Section 7.0

⁶ Appendix D, Section 4.0

⁷ Appendix D, Section 6.0

- For four of the six duty norms, dissatisfaction with the work environment (leader, job, fellow workers) produced a lowered perception of work group encouragement of norms.
- These same personnel perceive greater encouragement for avoidance of work by their work group.

Two patterns emerged by career group:

- Supply personnel reported much less net discouragement with respect to avoidance of work than maintenance or command personnel.
- Command personnel indicated very much stronger encouragement of two norms than the other career field groups:
 - compliance with wishes of superiors who have not earned respect.
 - fostering of group welfare.

The most significant thrust indicated by these group differences is the tendency of higher ranks and combat veterans to reflect encouragement of duty-oriented norms, compliance with superiors' wishes, and use of irregular logistics for mission or unit-oriented purposes.

3.1.2 Combat Conditions

The survey asked only combat veterans to report on perceived group norms under combat conditions. This had two significant effects: it effectively eliminated all personnel below the rank of E-4 from the sample and it effectively eliminated the statistical significance of differences among work groups, none of which included sufficient numbers of combat veterans to empirically evaluate the impact of unit variation on combat norms.

Table 3-2 indicates the association of work group norms under combat conditions. This association differs considerably

TABLE 3-2. ASSOCIATION OF GROUP NORMS UNDER
COMBAT CONDITIONS

<u>Group</u>	<u>Work Group Norms</u>
1	A high skill level Top priority to flight safety Compliance with wishes of well-liked superiors Following regulations at all times
2	Teamwork Fostering of group welfare Following of regulations only when they appear reasonable
3	A high sense of motivation and esprit Avoidance of work
4	Compliance with wishes of strongly disliked superiors Compliance with wishes of superiors who have not earned respect
5	Use of irregular logistic procedures to: -- insure the mission gets accomplished -- get the job done faster -- improve work group prestige

from that in garrison conditions. While the associations of logistic factors and of compliance with instructions of disliked superiors or superiors lacking in respect carry over from the garrison situation, the other associations of group norms are different and not subject to substantive interpretation without further research.

Table 3-3 provides the work group norms in combat perceived by combat veterans, and for comparative purposes, those perceived in garrison by the same combat veterans. Of particular note is the fact that in only seven (out of potentially 36) cases is there more than a 10% difference between combat and garrison with respect to encouragement or discouragement of norms. For three of the duty related norms, and three of the use of irregular procedure norms, there is more incidence in combat of encouraging the norm; for one of these latter norms (use of irregular logistic procedures for mission accomplishment) there is also a greater than 10% decreased incidence in combat of discouraging the norm. For avoidance of work, there is increased incidence in combat of discouraging the norm.

3.1.2.1 Group Differences

There are less than half as many instances of statistically significant differences for group norms in combat than there were in garrison (14 vs. 37).⁸ These group differences may be summarized as follows:

- o Among career groups, as in garrison, supply personnel reported more frequently encouragement of avoidance of

⁸ Omitting work group norms due to excessively small group set component cells.

Table 3-3. Work Group Norms Reported by Combat Veterans: Combat vs. Garrison Conditions

Work Group Norm	Condition	% Stating Groups Encourage Norm	% Stating Groups Discourage Norm	% Stating Groups Are Neutral
A high skill level on the job	Garrison Combat	90% 91	1% 2	8% 7
Use of irregular procedures which reduce safety	Garrison Combat	20 17	74 75	6 8
Strong sense of motivation and esprit	Garrison Combat	82 91	4 3	14 5
Teamwork	Garrison Combat	84 95	0 0	16 5
Fostering of group welfare	Garrison Combat	71 92	4 1	25 7
Strong sense of duty	Garrison Combat	78 95	3 0	18 5
Giving top priority to flight safety	Garrison Combat	92 90	2 2	6 8
Avoidance of work	Garrison Combat	16 13	66 82	18 5
Compliance with wishes of:				
Well-liked superiors	Garrison Combat	91 89	6 2	14 8
Strongly disliked superiors	Garrison Combat	39 49	30 24	31 27
Respected superiors	Garrison Combat	95 95	1 1	3 3
Superiors who have not earned respect	Garrison Combat	41 42	24 24	35 34
Following regulations:				
Without question at all times	Garrison Combat	74 72	8 11	18 17
Only when they appear reasonable	Garrison Combat	56 50	27 27	17 24
Use of irregular procedures for:				
Mission Accomplishment	Garrison Combat	58 77	29 11	13 10
Getting job done faster	Garrison Combat	57 75	19 17	11 8
Improving group prestige	Garrison Combat	54 61	19 15	27 25
Improving group living conditions	Garrison Combat	55 69	13 6	32 26

work, and command personnel much more frequently encouragement (and never discouragement) of compliance with the wishes of superiors who have not earned respect.⁹

- The Army reported more frequent encouragement of avoidance of work and following regulations only when they appeared reasonable than did the Air Force.¹⁰
- Personnel dissatisfied with both career and work environment reported significantly less encouragement of teamwork, priority to flight safety, and compliance with wishes of highly respected superiors than other groups. Personnel dissatisfied with their work environment (with or without career satisfaction) reported significantly less frequent encouragement of a high skill level on the job.¹¹
- Officers and warrant officers, in each case followed by senior NCO's, reported significantly more frequent encouragement of compliance with wishes of strongly disliked superiors, and superiors without respect; and use of irregular procedures to ensure the mission gets accomplished.¹²

To summarize, most combat veterans perceive that their work groups, under combat conditions, were supportive of the use of irregular procedures for a variety of purposes; fewer perceive this as true of work groups under garrison conditions. Officers are more likely to perceive work groups as supporting the use of irregular procedures under combat conditions than NCO's. There appears to be a direct relationship, although not a perfect one, between the increased support for teamwork, a strong sense of duty, and the fostering of group welfare found among units under

⁹ Appendix D, Section 3.0

¹⁰ Appendix D, Section 7.0

¹¹ Appendix D, Section 6.0

¹² Appendix D, Section 2.0

combat conditions, and the unit members' support for the use of irregular logistic procedures.

3.1.3 Hypotheses Concerning Work Group Norms

Six specific hypotheses were associated with work group norms. These are presented in Table 3-4 along with the findings based on the preceding discussion.

3.2 INCENTIVES/DISINCENTIVES

The survey asked respondents to gauge the overall effect of 27 incentives and disincentives on decisions to use irregular logistic procedures or strictly comply with standard logistic procedures under three demand situations which correspond to three critical decision points on Figure 3-1, Decision Map for the Use of Irregular Logistic Procedures:

- when desired items are authorized but not available in time through prescribed procedures; this situation corresponds to the decision point "Judge Prescribed Procedures Will Deliver in Time" and the incentives apply to the subsequent decisions.
- when desired items are authorized and available in time through prescribed procedures; this situation corresponds to the decision point "Judge Prescribed Procedure Will Not Deliver in Time" and the incentives apply to the subsequent decisions.
- when desired items are not authorized; this situation corresponds to the decision point "Judge Demand Illegitimate" and the incentives apply to the subsequent decisions.

These 27 incentives were divided into five groups:

- Duty-oriented Incentives (6)
- Selfish Incentives (4)
- Chain of Command Incentives (5)
- Other Incentives (12)

Table 3-4. Hypotheses concerning work group norms.

Hypotheses	Findings
1. That perceived work group norms will fall into patterns which differ among types of units and Services.	<u>Essentially Disconfirmed</u> There were relatively few significant differences by unit (work group) and Service (less than 20% of group norms were affected by either).
2. That perceptions of work group norms related to irregular logistic procedures will fall into patterns which differ by military rank of individuals surveyed.	<u>Confirmed under garrison conditions</u> <u>Essentially Disconfirmed in combat conditions</u> There were significant differences in perceptions by rank for two thirds of the group norms in garrison, for less than 20% in combat.
3. That perceptions of work group norms related to irregular logistic procedures will fall into patterns which differ according to the degree of job satisfaction of those individuals being surveyed.	<u>Disconfirmed</u> There were no significant differences in job satisfaction group perceptions applying to the four norms on use of irregular procedures.
4. That work groups that display norms which reflect a highly responsible attitude towards duty and teamwork will tend to encourage the use of irregular logistic procedures.	<u>Disconfirmed</u> Although officers, warrant officers and NCOs, and combat veterans tended to display this pattern of group norms, work groups (units) did not.
5. That perceived work group norms favoring the use of irregular logistic procedures will be stronger in combat than in garrison.	<u>Tentatively Confirmed</u> This was tested only for combat veterans, for whom it held (Table 3-3).
6. That work groups which encourage the use of irregular logistic procedures will reflect a highly responsible attitude towards duty and teamwork.	<u>Disconfirmed</u> This is the converse of 4.

Factor analysis tended to confirm these groups of incentives, which are discussed in the following paragraphs.

3.2.1 Duty-oriented Incentives

Five incentives were grouped by factor analysis across all three demand situations. A sixth, to speed up work, was associated with the other five in the situation of authorized, available items, and has been grouped with them. The duty-oriented incentives were perceived by a clear majority of the respondents as influences leading to the use of irregular logistic procedures when desired items are either authorized and unavailable or unauthorized (Table 3-4). When desired items are authorized and available, these five incentives are still perceived as promoting the use of irregular logistic procedures by 35% or more of the respondents. Mission accomplishment and task importance, specifically, were perceived by more respondents as leading to the use of irregular procedures in any situation, than any other incentives.

3.2.2 The Selfish Incentives

The first two selfish incentives--personal gain and others' personal gain--are associated by factor analysis across all three demand situations. The related incentives of the desire for "kicks" and the desire to acquire a reputation as a "good" scrounger are partially tied in by factor analysis.¹³ The selfish incentives can be viewed as the opposite end of a spectrum from the duty-oriented incentives, in the sense that they are moral opposites. Significantly, a majority of all personnel surveyed reported that none of the selfish incentives

¹³ "Kicks" across the "unauthorized" and "authorized not available" demand situations, "scrounger reputation" across the "unauthorized" and "authorized available" demand situation.

influenced the decision to use irregular logistic procedures, regardless of the demand situation (see Table 3-6). However, a substantial minority of the respondents reported that the desire to gain a reputation as a scrounger and personal gain are influences favoring the use of irregular logistic procedures when items are either unauthorized or authorized and available (Table 3-7). This confirms an impression of the study team that, under some demand situations, irregular logistic procedures are usually driven by the "best" of motives, occasionally by the "worst" of motives.

3.2.3 The Chain of Command Incentives

In all three demand situations, the respondents tended to associate fear of superiors with the avoidance of punishment by the chain of command. When desired items were unauthorized or authorized and available, the respondents also associated the desire to obtain military rewards such as commendations and promotions with the "chain of command" incentives. Except when the desired item is unauthorized, a majority of the respondents reported that these three incentives neither encouraged nor inhibited irregular logistic procedures (Table 3-8). However, significant minorities of the respondents reported that the incentive of military rewards and the disincentive of punishment by the chain of command tended to encourage the use of irregular logistic procedures (Table 3-9).

Except when the desired items are authorized and available, the respondents did not associate the incentives of pleasing superiors or compliance with direct orders with the chain of command incentives. However, these incentives are generically similar, and are included for comparison purposes. As can be observed from Tables 3-8 and 3-9, the proportions of respondents perceiving these incentives as motivations to use irregular logistic procedures or as having no

Table 3-5. Percentage of Respondents Perceiving Duty-Oriented Incentives As Leading To Use of Irregular Logistic Procedures.

- (a) when desired item is authorized but not available in time
 (b) when desired item is unauthorized
 (c) when desired item is authorized and available

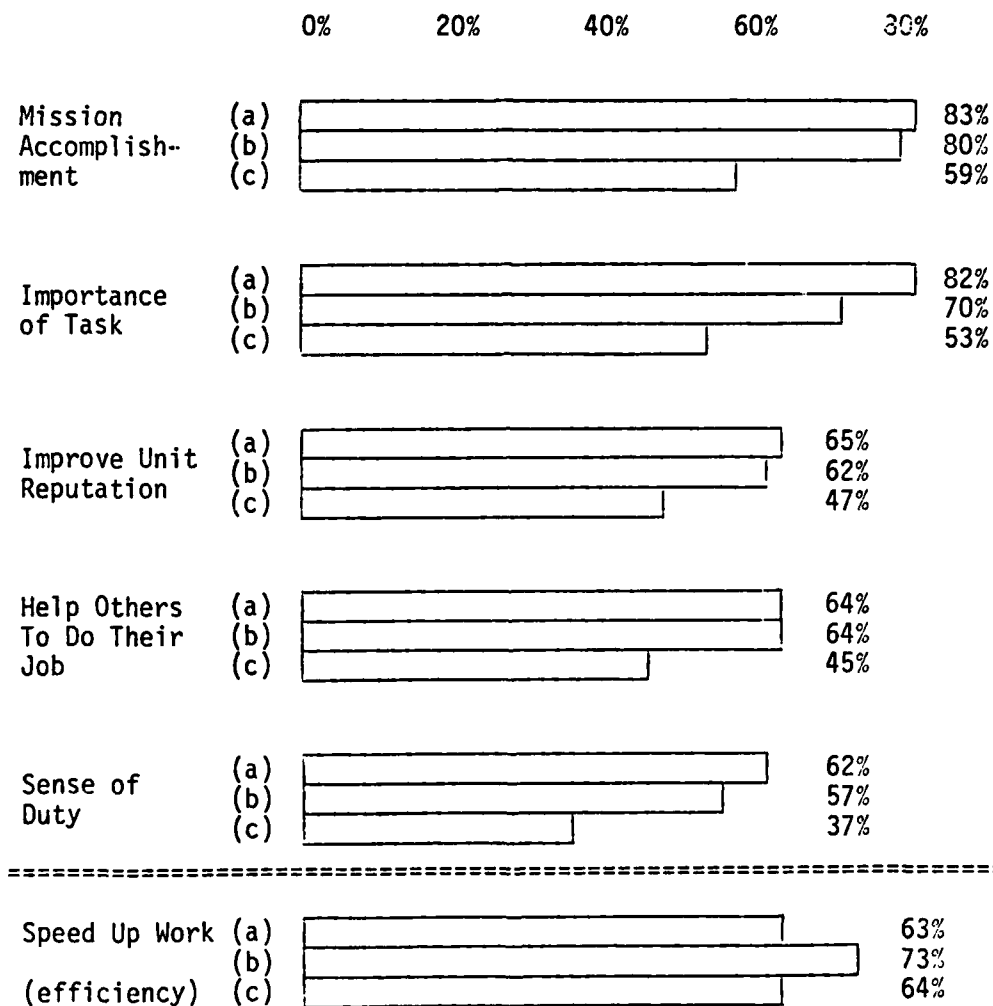


Table 3-6. Percentage of Respondents Perceiving Selfish Incentives As Having No Influence on Use of Irregular Logistic Procedures.

- (a) when desired item is authorized but not available in time
 (b) when desired item is unauthorized
 (c) when desired item is authorized and available

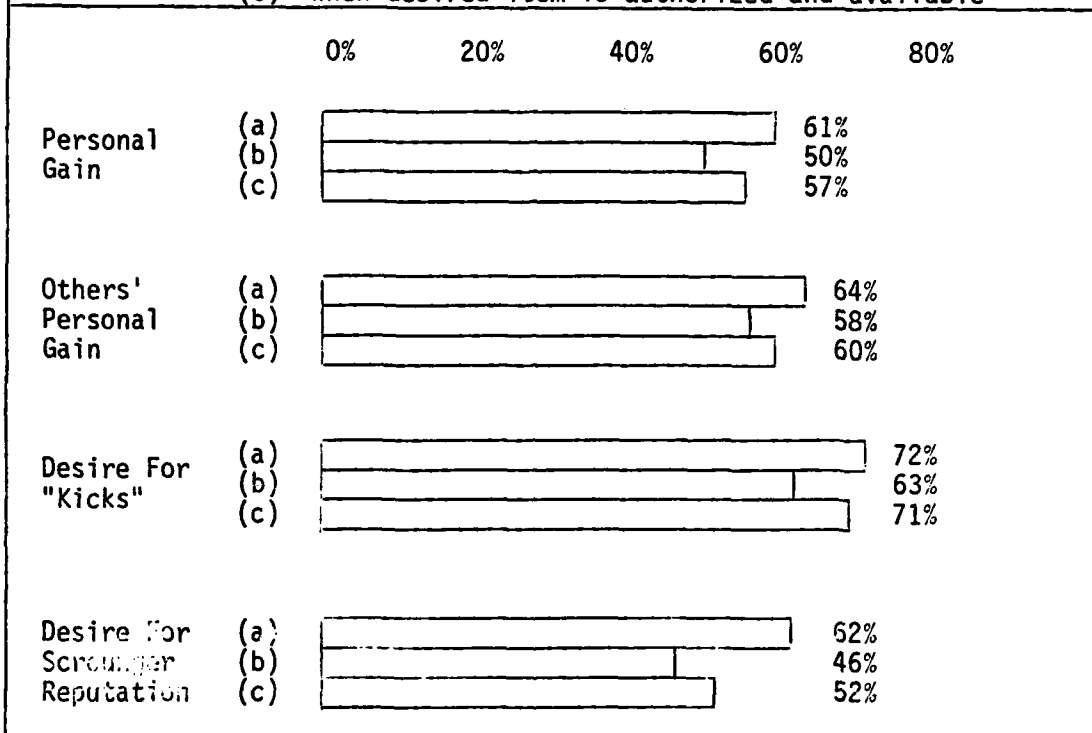


Table 3-7. Percentage of Respondents Perceiving Personal Gain and Desire for Scrounger Reputation As Motivating The Use of Irregular Logistic Procedures.

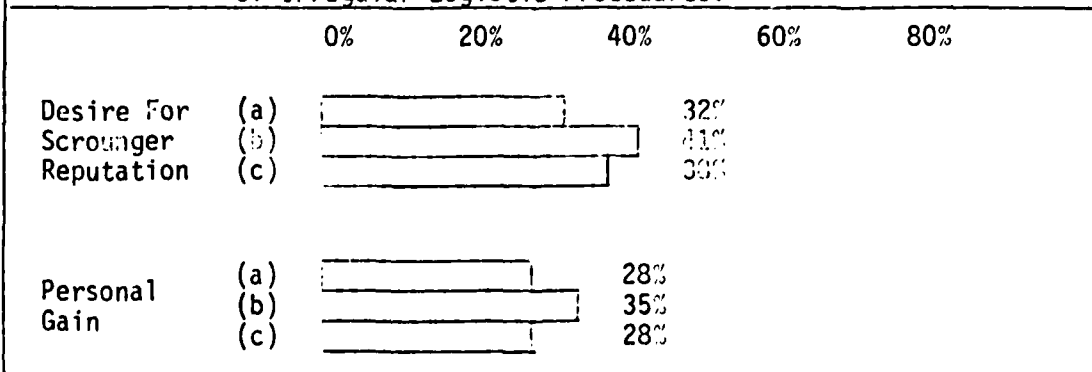


Table 3-8. Percentage of Respondents Perceiving Chain of Command Incentives As Having No Influence on The Use of Irregular Logistic Procedures.

- (a) when desired item is authorized but not available in time
 (b) when desired item is unauthorized
 (c) when desired item is authorized and available

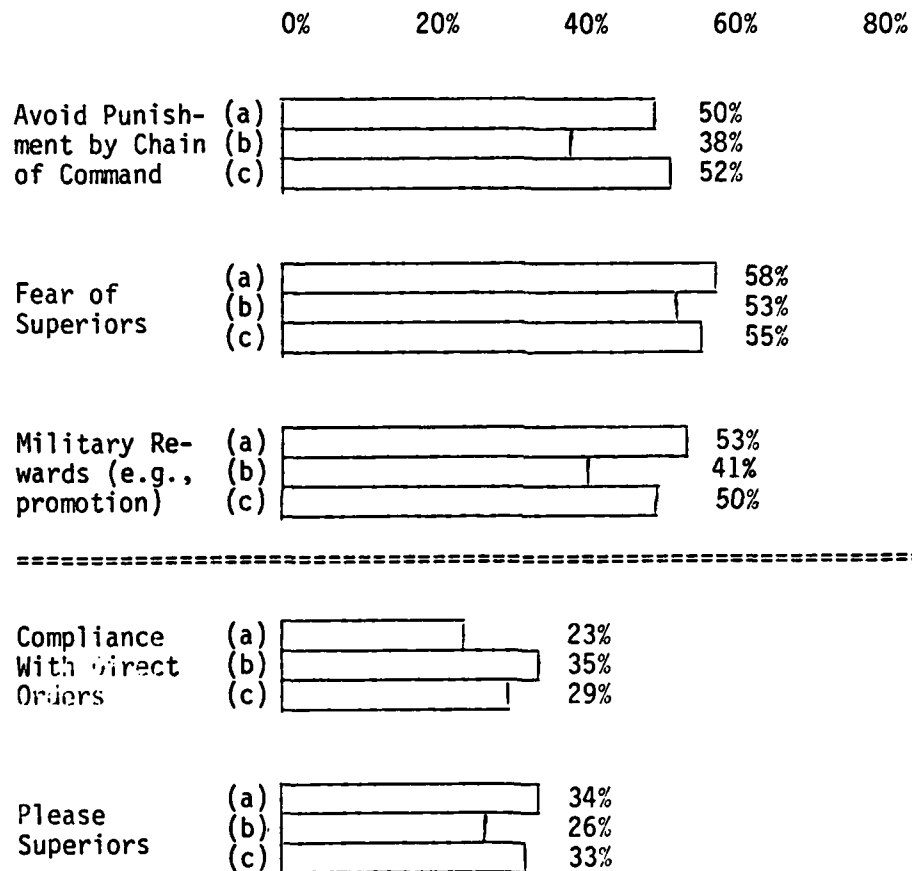
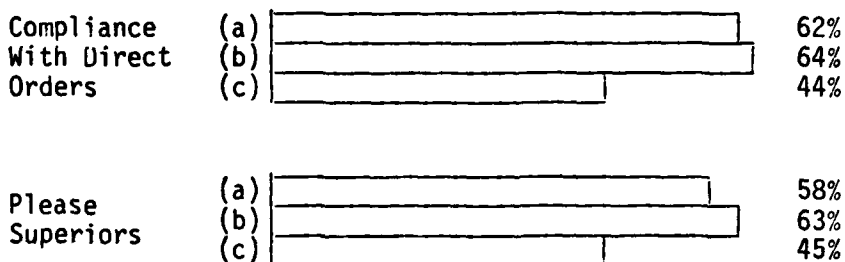
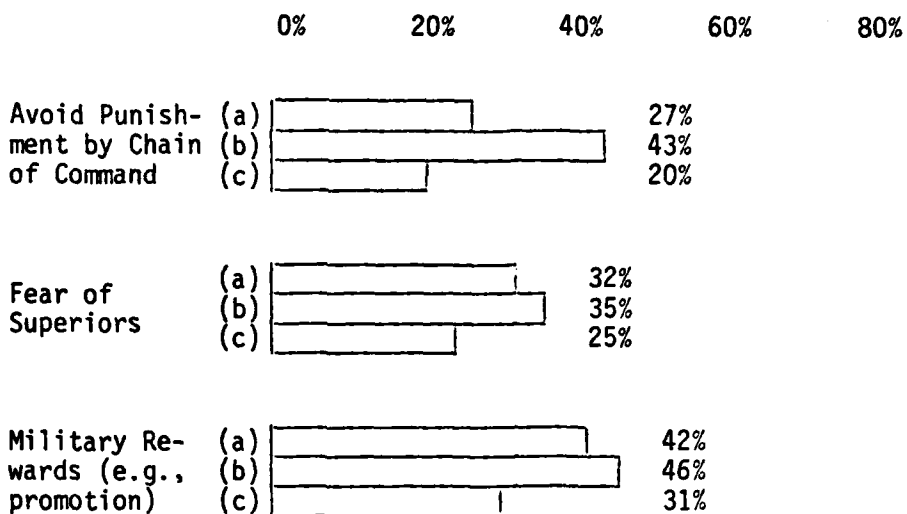


Table 3-9. Percentage of Respondents Perceiving Chain of Command Incentives As Motivating The Use of Irregular Logistic Procedures.

- (a) when desired item is authorized but not available in time
 (b) when desired item is unauthorized
 (c) when desired item is authorized and available



influence are approximately reversed from the first three. From Tables 3-8 and 3-9, it would appear that a majority of the respondents believe that decisions made in the User Decision Model tend to be influenced in favor of the use of irregular logistic procedures, under many situations, by their military superiors.

3.2.4 Other Incentives Perceived As Favoring The Use of Irregular Logistic Procedures

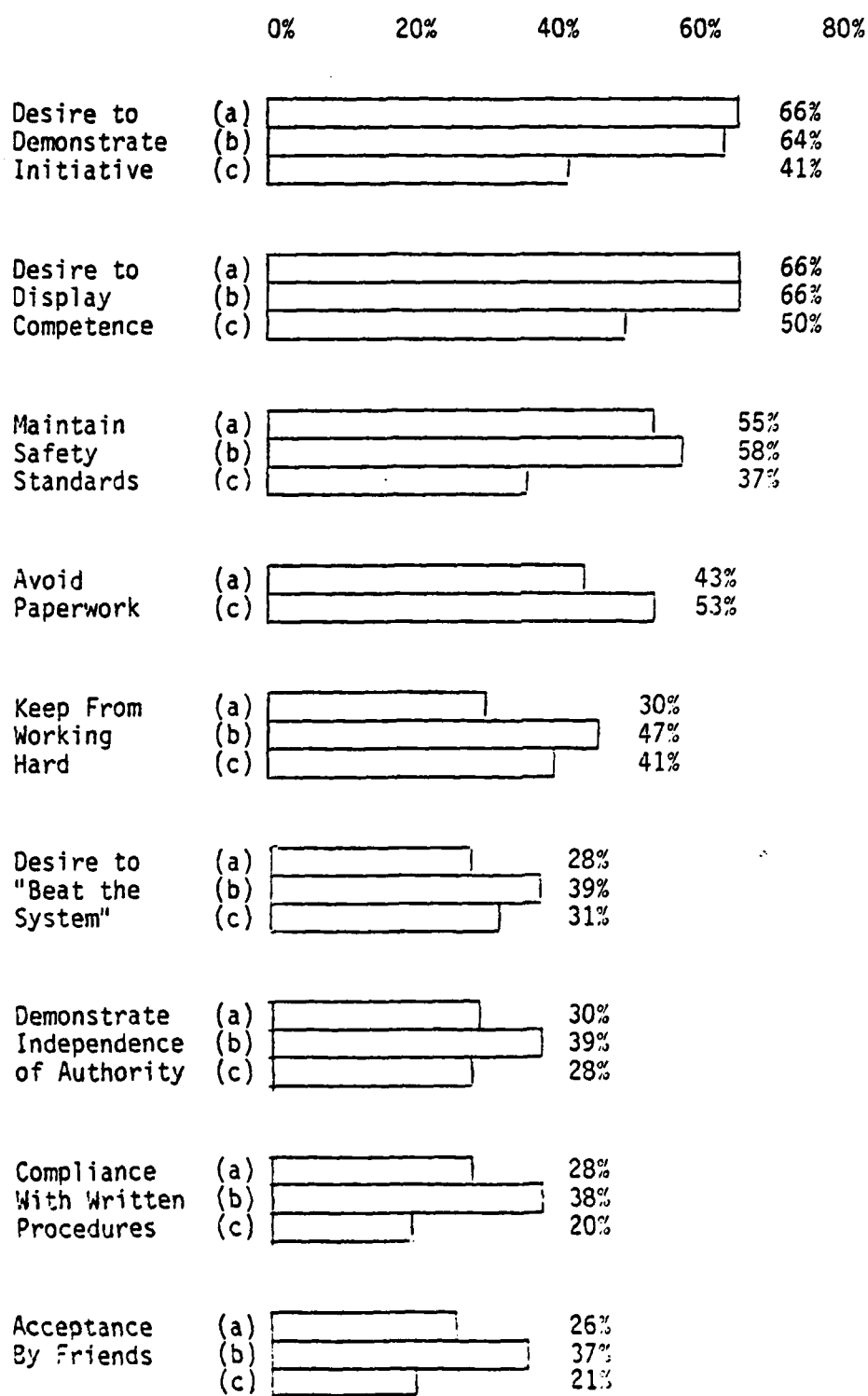
Of twelve other incentives, nine applicable to two or more demand situations were cited by at least 20% of the respondents as encouraging the use of irregular logistic procedures in at least one situation. The desire to demonstrate initiative, the desire to demonstrate competence, and the desire to maintain safety standards were all cited by a majority of the respondents as leading to the use of irregular logistic procedures when items are unauthorized or authorized but not available in time (Table 3-10). Significantly fewer respondents believed that these very "positive" incentives affected logistic decisions when the desired item was both authorized and available. Thus, these incentives produced a pattern similar to the incentive of fulfilling a sense of duty; they are relevant to most personnel only when the logistic system cannot or will not supply a desired item.

The other six potential incentives shown in Table 3-10¹⁴ are not actual incentives to a majority of the respondents. Of the three incentives not previously discussed in this paragraph, two were perceived by more than two-thirds of the respondents as having no

¹⁴ Respondents were not asked if avoidance of paperwork is an incentive when items are unauthorized because no amount of prescribed paperwork could lead to the acquisition of an illegitimate item or service.

Table 3-10. Percentage of Respondents Perceiving Other Incentives As Motivating The Use of Irregular Logistic Procedures

- (a) when desired item is authorized but not available in time
 (b) when desired item is unauthorized
 (c) when desired item is authorized and available



influence on the decision to use irregular logistic procedures under any demand situation (Table 3-11).

Finally, it was thought that one incentive--the desire to gain independence from the supply system--would be found to be particularly influential in the decision to hoard, i.e., to acquire authorized and available items in greater quantity than immediately needed. For this reason, respondents were asked about the effect of this incentive on this specific irregular logistic procedure when a desired item was both authorized and currently available (but this, of course, does not necessarily mean available in the future). A clear majority of all respondents (58%) believed that this incentive does, in fact, favor hoarding, another decision reflected in the Decision Map of Figure 3-1. Only 26% of the respondents reported that the incentive did not affect logistic decisions when items were authorized and currently available through prescribed procedures.

3.2.5 Group Differences

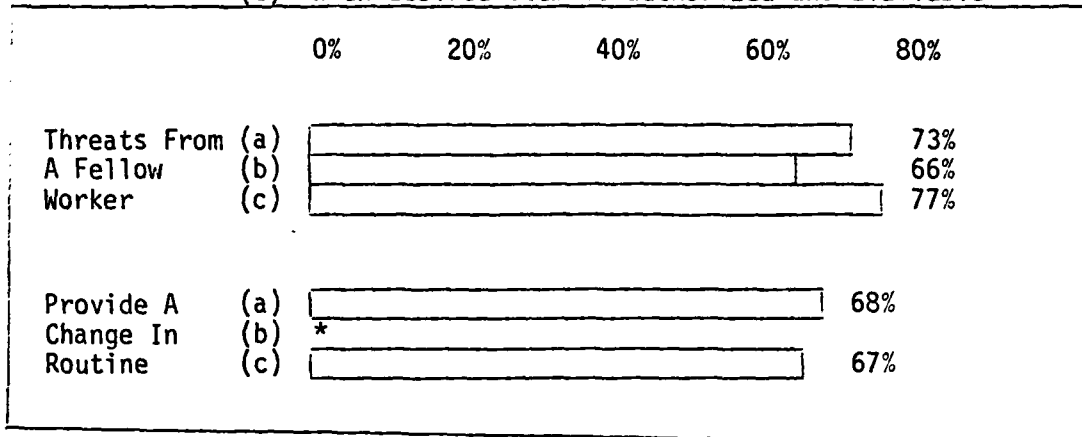
There are few group differences with respect to incentives except with respect to rank, and then only for the situations involving unauthorized items and items which are authorized but not available. In those two cases, there are 8 and 9 statistically significant differences by rank respectively. Otherwise, there are no more than three per group set for any situation. The group differences may be summarized as follows:

- o The general pattern of differences by rank is that in 18 instances¹⁵ officers and warrant officers think the potential incentives listed are more of an influence to use of

¹⁵Eight of the 18 were duty-oriented incentives, only one a selfish incentive, and two chain of command incentives.

Table 3-11. Percentage of Respondents Perceiving Other Incentives As Having No Influence on the Use of Irregular Logistic Procedures

- (a) when desired item is authorized by not available in time
- (b) when desired item is unauthorized
- (c) when desired item is authorized and available



*Respondents were not asked if boredom alone provided an incentive to use irregular logistic procedures to obtain unauthorized items.

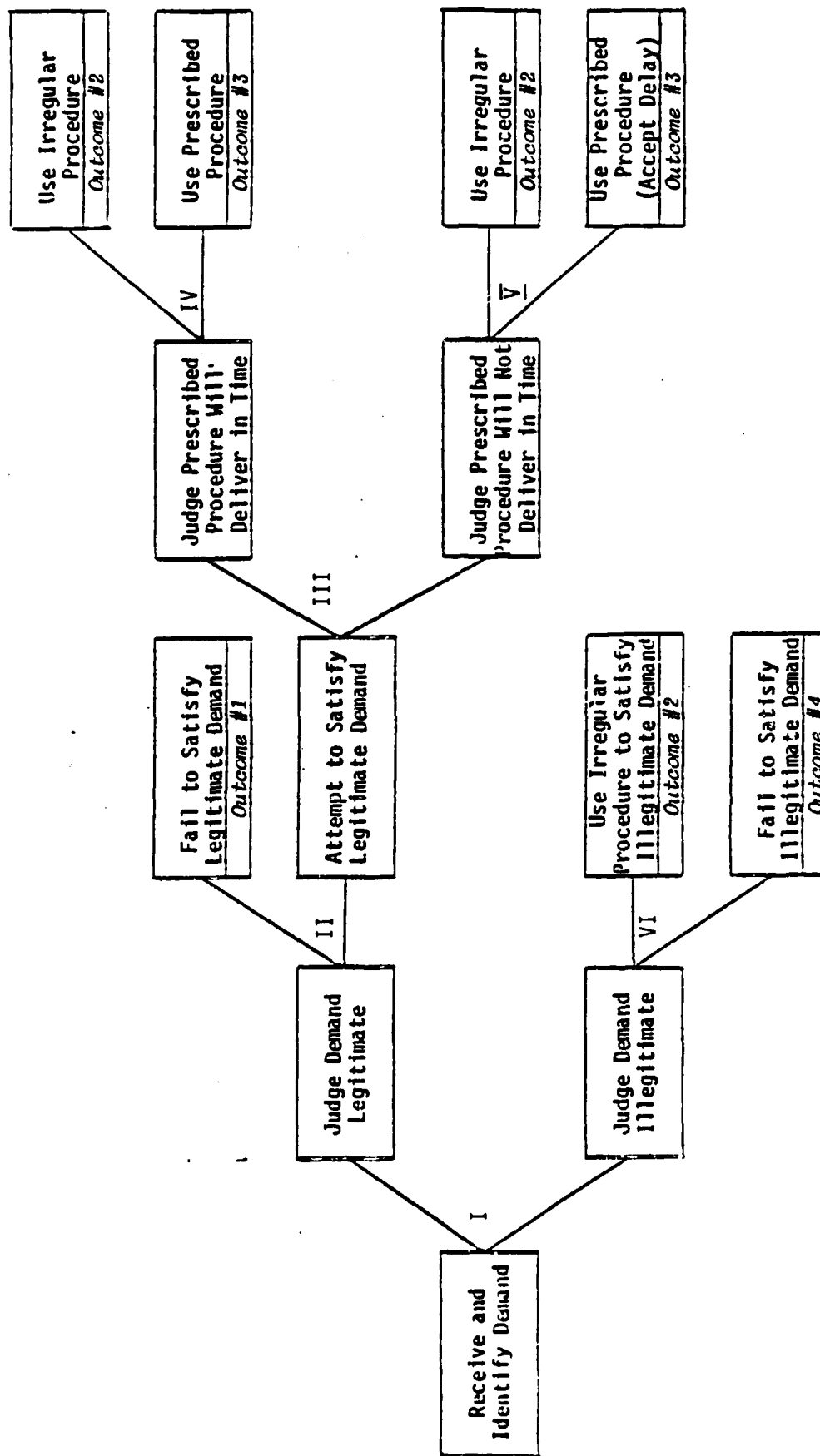


Figure 3-1. Decision Map for the Use of Irregular Logistic Procedures to Obtain Items or Services to Satisfy Current Demands

irregular procedures than enlisted men and non-commissioned officers. In the 19th instance, personal gain of others, the officers and warrant officers think it is less of an incentive.¹⁶

- The other differences are few and do not appear to add significant substance to the analysis. They are covered in Appendix D.

3.2.6 Hypotheses Concerning Incentives/Disincentives

Four hypotheses concerning individual incentives and disincentives are addressed in Table 3-12, and seven concerning decision outcomes are addressed in Table 3-13. The hypotheses in Table 3-13 are directly linked to the Decision Map of Figure 3-1. That decision map is repeated in Figure 3-1, with appropriate numbering of decision points. Three additional decision points reflected in Appendix B (pp. 3-13, 3-14) are the decisions concerning:

- Using irregular procedures to prepare for future needs.
(decision point VII)
- Taking maintenance short cuts.
(decision point VIII)
- Accepting the use of equipment with maintenance deficiencies
(decision point IX)

¹⁶ Appendix D, Section 2.0

TABLE 3-12

HYPOTHESES CONCERNING INDIVIDUAL INCENTIVES AND DISINCENTIVES

Hyptheses	Findings
1. That different patterns of incentives and disincentives perceived as influential by individuals will be associated with different states of authorization for items or services (i.e., not authorized, authorized and available in time, or authorized but not available in time).	<u>Confirmed</u> The most easily demonstrated difference in such patterns is illustrated by Tables 3-5 through 3-7. The first five incentives listed in Table 3-5 demonstrate one pattern, the four in Table 3-6 another pattern, and the last incentive in Table 3-5 and the two in Table 3-7 a third pattern.
2. That among the groups of individuals surveyed (grouped by rank, type of job, or degree or job satisfaction) there will be different patterns of incentives and disincentives.	<u>Partially Confirmed</u> As brought out in paragraph 3.2.5, there is a marked difference in patterns by rank--but by no other group set.
3. That the developed patterns of incentives and disincentives will link those encouraging the use of irregular logistic procedures with those reflecting responsible attitudes toward military duties (including mission accomplishment).	<u>Confirmed</u> Both the association of high levels of perceptions of encouragement of duty norms and use of irregular logistic procedure norms in paragraph 3.1, and the high levels of perception of duty-oriented incentives as leading to the use of irregular logistic procedures in Table 3-5 tend to confirm this.
4. That a pattern of attitudes will be identified that indicates a net influence for most individuals which is conducive to hoarding parts to prepare for future requirements.	<u>Confirmed</u> See paragraph 3.2.4, last subparagraph.

TABLE 3-13

Hypotheses Concerning Decision Points

Hypotheses	Findings
That the patterns of incentives, disincentives, and work group norms will reflect a net influence in favor of: 1. Attempting to satisfy a legitimate demand (decision point II). 2. Using prescribed procedures when it is believed that they will satisfy the demand for an authorized item or service in time (decision point IV). 3. Using an irregular procedure when it is believed that the prescribed procedures cannot satisfy the demand for an authorized item or service in time (decision point V). 4. Failing to satisfy an illegitimate demand unless it is for an item considered essential or contributory to mission accomplishment (decision point VI). 5. Using irregular procedures to prepare for future needs for authorized items (decision point VII). 6. Taking maintenance short cuts when they are perceived as saving time and effort without reducing the quality of the results. (decision point VIII). 7. Accepting the use of equipment with maintenance deficiencies in combat when it is essential to the mission (decision point IX).	<u>Confirmed.</u> The strong influence of the duty oriented norms and incentives confirm this. <u>Probably Disconfirmed.</u> The marginals tabulated with question 46 (incentives when item is authorized and available) do not indicate such a net influence. Research designed to address this hypothesis with greater specificity might change this. <u>Confirmed.</u> Strong incentives to this effect were identified. See Table 3-5. <u>Neither Confirmed nor Disconfirmed.</u> Data inadequate to give a clear answer. <u>Confirmed.</u> See paragraph 3.2.4, last subparagraph. <u>Confirmed.</u> See Table 2-8. <u>Tentatively Disconfirmed.</u> See Table 2-19.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

4.0 GENERAL

This is an exploratory study, taking a look at the field of irregular logistic procedures by examining in detail a carefully selected but very limited segment of the military logistic system. The expectation was that this study would produce some potentially useful and currently applicable conclusions and recommendations despite its limited scope, as well as pointing out potential areas in which further exploration is required before adequately supported conclusions and recommendations could be produced. In the Interim Report, Appendix B, some general hypotheses, not subject to testing as part of this study, but providing overall context, were listed. These are listed in Table 4-1. The conclusions and recommendations which follow consider these and the interim report (Appendix B) from which they are taken, as well as the findings of Sections 2 and 3.

4.1 CONCLUSIONS

These are structured in terms of conclusions relevant to the military logistic situation, the types of irregular logistic procedures, group norms, and individual incentives; and in terms of general conclusions. It is noted that a mix of two types of conclusions is required for optimum benefit in the study: (1) conclusions which the reader is convinced from his own experience are true and obvious (these conclusions demonstrate that the analytic process produces

→ (see p. 4)

Table 4-1. GENERAL HYPOTHESES

The following are general hypotheses not subject to testing with the data obtained in this study. It is hypothesized that:

- A. The specific hypotheses as tested for helicopter units and their backup maintenance support units apply generally for supply and maintenance to other operational military units and their backup logistic support units.
 - B. Each type of logistic operation will have its own characteristic set of irregular procedures, some of which are shared with other types of logistic operations.
 - C. The military logistic system cannot for any type of logistic operation meet all essential demands in time without use of irregular logistic procedures.
 - D. Environmental conditions may in some circumstances impact strongly on the use of irregular logistic procedures, especially with respect to demands related to human welfare.
 - E. As a general rule, decreases in complexity of equipment will decrease the necessity for the use of irregular logistic procedures.
 - F. As a general rule, decreased requirements for maintenance in equipment will decrease the requirement for the use of irregular logistic procedures.
 - G. As a general rule, decreased density of equipment will increase the requirements for use of irregular logistic procedures.
 - H. Human welfare/creature comfort related uses of irregular logistic procedures are fostered by the high U.S. expectations concerning appropriate standards of living for troops in the field.
 - I. Most irregular logistic actions are based on constructive attitudes reflecting a desire to contribute to mission accomplishment (including provision for troops welfare).
 - J. Use of irregular procedures is essential to effective operation of all complex, centralized hierarchical organizations.
-

Table 4-1. GENERAL HYPOTHESES (Continued)

- K. The study of individual operating systems (such as a specific tank, artillery, or aircraft system) can indicate principle sources or irregular logistic procedures used with that system (or that are likely to be used with that system in the case of developmental systems); and further, that such study can produce improvements in the system or in prescribed procedures associated with the system that will increase operational readiness and reduce negative impacts from the use of irregular logistic procedures.
-

sound answers); and conclusions which are not expected by the reader (from these he gains new information). Most readers will find both types below.

4.1.1 The Military Logistic Situation

It is concluded that, with respect to operational and supporting military helicopter units:

- A. The principal characteristic of the military logistic situation contributing to the use of irregular logistic procedures is the existence of unsatisfied demand for items perceived as needed for the mission, regardless of whether they are authorized or not. Additional characteristics are the inability of individuals at times to know what is authorized; the refusal (or inability) of the logistic system to authorize everything which users feel is needed for the mission; and, in those cases where self-oriented incentives are involved, the availability of items and services which can be converted to personal gain.
- B. Most servicemen, but particularly those of higher rank (greater responsibility) and those with combat experience, feel that use of irregular logistic procedures is justified when necessary to obtain mission related items and services, whether authorized or not.
- C. Most servicemen feel that if they never used irregular logistic procedures in combat, or for parts supply in garrison, they would be able to perform their jobs less than adequately.
- D. The instigator of the use of irregular logistic procedures is most likely to be the individual or his superior.
- E. The use of irregular logistic procedures is unlikely to be punished, particularly in combat, and, in combat, may well elicit praise from superiors.

4.1.2 Irregular Logistic Procedures

It is concluded that, with respect to operational and supporting military helicopter units:

- A. All irregular logistic procedures are seen by some individuals as helpful, some as harmful. The procedures can be meaningfully ranked by the net perceived harmful vs. helpful effect, and by their perceived normative status as a minor transgression of regulations, or as a significant breach of right and wrong.
- B. It is possible that the greater utility of gifts, favors, and bribery in combat perceived by the Army could stem from a reported disparity in Service priorities for equipment in Vietnam due to administrative differences in their supply systems.

4.1.3 Group Norms

It is concluded that, with respect to operational and supporting military helicopter units:

- A. There is a set of duty/mission-oriented group norms operative in a very high proportion of Service units.
- B. Group norms operate significantly in favor of use of irregular logistic procedures to accomplish mission and unit oriented objectives.
- C. Rank and combat experience tend to significantly intensify the trends indicated in A and B.

4.1.4 Individual Incentives

It is considered that, with respect to operational and supporting military helicopter units:

- A. Individuals are motivated towards use of irregular logistic procedures:
 - (1) With little differentiation between demands for unauthorized items/services and for items/services authorized but not available.
 - (2) Most strongly by mission/duty-oriented incentives.
 - (3) Secondarily by punishment/reward type incentives

- B. A minority of individuals are motivated towards use of irregular logistics by selfish or frivolous incentives.
- C. There is remarkable uniformity amongst different population groups within the military with respect to incentives to use irregular logistic procedures, with only one significant pattern of differences: officers and warrant officers feel the incentives listed, particularly the constructive ones, to be more of an influence towards use of irregular procedures than enlisted men and NCO's.

4.1.5 General Conclusions

- A. A significant reduction in the non-availability of required items or services when needed at the user level should result in a significant reduction in the use of irregular logistic procedures.
- B. Design of equipment, and of repair parts and maintenance support policies for that equipment, could be accomplished in such a way as to minimize the use of irregular logistic procedures.
- C. The spectrum of types of irregular logistic procedures is graded in such a manner on functional and normative criteria as to permit design of human factors approaches minimizing use of selected, more harmful types of irregular logistic procedures.
- D. The use of irregular logistic procedures motivated by mission-related incentives cannot be eliminated in the real world without destroying operational readiness.
- E. There is an element of use of irregular logistic procedures motivated by non-mission related incentives which is undesirable and should be minimized. The concurrent existence of use of irregular procedures for essential purposes creates a psychological problem in fighting non-mission related uses. This should be recognized and studied explicitly to determine means of clearly delimiting the two types of use in the average serviceman's mind. The mission-oriented use should then be channeled constructively to minimize harmful side effects, the non-mission oriented use should continue to be rigorously discouraged.

- F. Generically, the constructive use of irregular logistic procedures does not appear significantly different than the newsman's pursuit of news from covert and unauthorized sources, the Congressman's insistence on cutting of red tape for his constituent, the law enforcement officer's operation of an "Operation Fence."
- G. That there is a great deal more detailed information in the data base developed from the study questionnaire than has been extracted for this study; however, analysis in further detail would be much more effective if accomplished based on a carefully designed sample appropriate to the particular objective at hand.
- H. The incentive structure and user decision models developed for use in this study were valid and useful.

4.2 RECOMMENDATIONS

- A. That the constructive use of irregular logistic procedures be recognized for the essential component of military logistic operations that it is, and not be treated as sex in the Victorian Age.
- B. That Service logistic systems be designed to, insofar as possible, equalize priorities for units with similar missions in a given locality, so that item/service imbalances leading to perceived utility of using gifts, favors, or bribes will be minimized.
- C. That the Services maintain and use as a readily available significant indicator data on the percent of all demands for mission-related items or services which cannot be met when presented at the user level. This should be done overall and by weapons system, aggregated and by appropriate command level.
- D. That budgetary consideration of O&S appropriations include as a mandatory element the estimated impact of funding levels for logistic support on the percent of demands satisfied when presented at the user level.
- E. That determination of the most cost effective accommodation to irregular logistic procedures be a part of weapons system design.

- F. That human factors studies be conducted aimed at maximizing benefits from and minimizing harmful effects from the use of irregular logistics procedures.
- G. That other appropriate fields of endeavor, public and private (commercial, industrial, professional) be examined from an irregular procedures viewpoint.

APPENDICES

APPENDIX A

MILITARY, SOCIOLOGICAL, AND PSYCHOLOGICAL PERSPECTIVES
ON IRREGULAR LOGISTIC PHENOMENA

APPENDIX A

MILITARY, SOCIOLOGICAL, AND PSYCHOLOGICAL PERSPECTIVES ON IRREGULAR LOGISTIC PHENOMENA

1.0 INTRODUCTION

This Appendix provides the military, sociological (i.e., organizational), and psychological background on irregular logistic phenomena, reflecting the literature search, interviews, and other research tasks associated with the current study. The division of aspects of the irregular logistic procedure phenomena into these three dimensions is occasionally somewhat arbitrary; for example, there are psychological elements in military operations and in sociological characteristics. It is therefore suggested that a full appreciation of the complexity of the incentives for irregular logistic procedures can be derived only from consideration of all three dimensions.

2.0 THE MILITARY DIMENSION

As treated in this Appendix, the specifically military aspects of irregular logistic phenomena consist of the historical background (Subsection 2.1), selected relevant aspects of the contemporary logistic system (Subsection 2.2), and the relationship between the use of irregular logistic procedures for military purposes and personal gain (Subsection 2.3).

2.1

HISTORICAL BACKGROUND

Van Crevald divides the modern history of military logistics into two periods: warfare from Wallenstein to von Schlieffen, in which logistics could be seen as an exercise in more or less well organized plunder; and the period since 1914, when most logistic support has been received from an organized logistic base.¹ Through most of the first period, subsistence for men and horses, obtained by local "appropriation," comprised some 90% of the logistic requirement, with supplies brought from rear bases constituting perhaps 10%. As late as 1870, ammunition was a negligible fraction of all logistic requirements. In World War I, the proportion of ammunition to other supplies was reversed, and, by the end of the war, subsistence had dropped to some 10% of all supplies. Logistic support from a fixed base was a necessity under those circumstances, as an army could not scrounge ammunition, sufficient POL, and other military supplies from the countryside. At the same time, motor transport provided the previously missing effective link from the railhead to troop units. Throughout both periods of modern history, regardless of whether we are considering the armies of Maurice of Nassau in the 17th century or George Patton, Jr., in the 20th, two consistent thrusts generated by the nature of war and of man have been observable. One is the necessity of using various irregular logistic procedures to overcome the "friction of war"² and accomplish the mission. The second has been the detrimental impact on operational effectiveness of certain irregular logistic procedures, particularly those that result in excess accumulation which hinders mobility or misallocates resources.³

¹Van Crevald (1977), pp. 6, 24, and 233.

²That all warfare consists of an endless series of difficulties-- things that go wrong-- is a commonplace, and is precisely what von Clausewitz meant when talking about the "friction" of war. Van Crevald (1977), p. 231.

³Marshall (1950) in The Soldier's Load and the Mobility of a Nation provides an exceptionally realistic portrayal of the former problem.

In the brief historical background covered in the following subparagraphs, the environment, the logistic systems, the nature of warfare all change, but these two thrusts remain constant.

In the 1600s to 1800s, armies lived off the land -- they could not do otherwise. Even then, however, they were plagued by the "pack rat" syndrome. In those days the baggage of troops and officers on campaigns often assumed monumental proportions, turning armies into huge blundering bodies of men and wagons.⁴ The system improved with time. Around the beginning of the 18th century the Duke of Marlborough had advance agents contact local authorities and levy support requirements paid for in cash. A hundred years later, Napoleon did likewise, offering receipts instead of cash.⁵ Napoleon did much to organize his logistic system, but he still both depended on and suffered from irregular logistics. In marching from the Rhine to the Danube, he exhorted his subordinates "to improvise, replace one commodity by another, and secure the troops provisions 'by hook or by crook'". In the same campaign, however, the corps followed his injunctions too well. The corps wagon-masters and the cavalry stole and hid all the animals they could find, causing a desperate lack in the communications services. It became impossible even to maintain a regular courier service with France. Napoleon had to intervene to order the Corps to give up their surplus transport. But the excess accumulation problems were not uniquely French. The Austrians in 1809, for example, were able to match the marching performance of the French only by drastically cutting down the establishment of wagons, pack-horses and baggage.⁶

Historians have regarded Prussian supply organization in the Franco-Prussian War as one of that country's greatest military achievements, based in part on von Moltke's claims. The Prussian Army's

⁴Van Crevald (1977), p. 6.

⁵Ibid. pp. 52, 53.

⁶Ibid. pp 53, 56, 57, 75.

supply service was theoretically capable of supporting it. But in practice it failed. Von Moltke's initial rapid deployment to the Rhine was at the cost of separating the troops from their transport. Logistic support never did really catchup. In the German armies around Paris, thousands of soldiers had to be diverted to harvest, thresh, mill and bake local grain. Railways were pressed into service, but the troops always ended up too far from the railheads for the supply services to bridge the gap. Similar problems afflicted execution of the von Schlieffen plan in 1914 - the Germans could not bridge the gap from the railheads to the moving troops. Rations had to be obtained from the countryside and transport horses starved to death. Thus, throughout the first period of modern history (as defined from a logistics viewpoint) the "friction" of war won out handily over the best laid plans of logisticians. Successful operations depended on the ability to satisfy logistic needs from outside the logistic system.

World War I marked the transition to more modern logistics, involving both the need and capability to supply the troops from a logistics base. Railroads were effective for bringing up supplies for both sides in later phases of World War I, since the warfare was so static.⁷

World War II saw the emergence of modern, comprehensive logistic systems. The Germans and the Americans were at opposite ends of a spectrum in this respect. The German invasion of the Soviet Union was the largest single military operation of all time. The logistic problems were staggering. The means available to the Wechmacht were extremely modest. The near success of the Germans was due less to the excellence of their preparations than to "the determination of troops and commanders to give their all, to bear the most appalling hardships and to make do with whatever means were given to, or found by them."³ In other words, by grim determination plus maximum exer-

⁷Ibid. pp. 96-140, 233.

³Ibid. p. 175.

cise of irregular logistics procedures (in their beneficial sense).

In contrast, the Allies invading France in 1944 to an unprecedented extent were able to select, design, develop, test, and manufacture equipment needed for the task. They made detailed provisions for loading and unloading supplies down to the last jerrycan. Within hours of the first landings all plans for orderly unloading were thoroughly disrupted due to the "friction" of war--unexpectedly heavy surf, fierce enemy resistance, navigation errors, inadequate beach exits, demands on equipment exceeding what it was designed for, general confusion, and inability to adhere to fixed, detailed plans, to cite a few of the problems. Intended to prevent waste, the detailed plans actually contributed to it as they went awry. The beaches, however, soon proved capable of discharging far in excess of what had been planned. This was achieved by relying on determination, common sense, and improvisation.⁹ At the same time as the invading forces were demonstrating the need for irregular logistics to overcome the "friction" of war, they were also demonstrating the potential lethality of "pack ratting." "SLAM" Marshall graphically describes this.¹⁰

In the initial assault waves at Omaha Beachhead there were companies whose men started ashore, each with four cartons of cigarettes in his pack--as if the object of the operations was trading with the French. Some never made the shore because of the cigarettes. They dropped into deep holes during the wade-in, or they fell into the tide nicked by a bullet. Then they soaked up so much weight they could not rise again... When I had concluded my work with the survivors of the companies which had landed during the initial Omaha assault, the impression was inescapable that weight and water--directly or indirectly--were the cause of the greater part of our losses at the beach.

On 11 August, SHAEF logisticians completed a feasibility study which showed that an offensive by four U.S. Divisions across the Seine could perhaps be supported, if certain other activities were postponed. Included was postponing the liberation of Paris until late October. Paris was liberated 25 August. By 7 September, both Patton and Hodges had their armies 200 miles beyond the Seine. A week later 16 U.S.

⁹Ibid. pp. 204-211.

¹⁰Marshall (1950), pp. 35, 36.

divisions were being supported, even if inadequately, on or near the German frontier. Transport to carry the supplies had been stripped from hundreds of lower priority units. First and Third Armies created rolling magazines to provide ammunition -- inefficient use of transport, but the only way they could ensure at least some supplies would be available. Third Army was notorious for its irregular logistics. Foraging parties impersonated members of other units; trains and convoys were diverted or hijacked; trucks bringing supplies from the rear were robbed of the fuel they needed for the return journey; spotter planes were sent hundreds of miles to the rear to ferret out fuel shipments. And the "friction" of war was greatly alleviated, if not overcome. But at the same time, the negative effects were severe. Vehicles without maintenance broke down, as did the effectiveness of men working under the strain. By the end of August, half of the total supply of jerrycans had been lost, limiting the entire POL supply system. Supply discipline, especially in Third Army, was poor. Huge quantities of clothing and other equipment was left behind, swamping salvage companies.¹¹ Both aspects of irregular logistics--the beneficial and the detrimental--were displayed with a vengeance. Van Crevald comments:

Not only did the actual development of the campaign have little in common with the plans, but the logistic instrument itself functioned very differently from what had been expected. Consequently, it would

¹¹Van Crevald (1977), pp. 217-221. Interestingly, Marshall notes that Third Army was one of the two armies in the European Theater of Operations which had the best records for supply conservation, figured on a division tonnage basis (Seventh Army was the other). They required 35 tons per division compared to 70 for the worst army. Thus, despite what they left behind, and recognizing that they undoubtedly obtained rather more than the records show, Third Army probably returned more operational results for less logistic resource expenditure than the other armies in the European Theater. Marshall (1950), pp. 99, 100.

hardly be an exaggeration to say that the victories the Allies won in 1944 were due as much to their disregard for the preconceived logistic plans as to their implementation. In the final account, it was the willingness--or lack of it--to override the plans, to improvise and take risks, that determined the outcome.¹²

In the immediate post World War II period, irregular logistic procedures continued to be employed to meet the requirements of Cold War operational readiness. One incident which illustrates the operational impact of the use of irregular logistic procedures in this environment took place in 1949 in California:

A naval squadron had 24 aircraft of which 18-20 were normally operational. A surprise inspection discovered a large stock of unauthorized parts in the squadron. The squadron was required to turn in all excess spares and repair parts; instructed to utilize the normal requisitioning procedures; and told to report each aircraft awaiting parts as Not Operationally Ready Supply (NORS). In approximately four days, all 24 squadron aircraft were NORS and zero aircraft Operationally Ready. The senior operational commander involved wanted to know why. Upon being told, he instructed that maximum effort be exerted through the authorized logistic chain to improve the operational status of the squadron. This resulted in an operationally ready level of approximately six aircraft attained within a few days and maintained thereafter. Within two weeks, an order was given to get the squadron up to its previous standards of operational readiness. No more was said about unauthorized parts nor were other squadrons in the area inspected for similar procedures.¹³

In Korea, irregular logistics was again essential to keep units operating, especially early in the war, but Korea also provides more examples of the negative side of irregular logistics in support of "SLAM"

¹²Van Crevald (1977), p. 236.

¹³Reported by Captain Dwight DeCamp, USN (retired). Captain DeCamp was a junior officer in the squadron described at this time.

Marshall's comments, Lt. Col. Scherer, Assistant G-4, 7th Infantry Division, made observations substantially as follows.¹⁴ During the first six months of Korea, infantry units did not trust their divisional service units to keep them supplied. Units lost a great deal of mobility because of their overload of supplies. S-4's made "deals" in Pusan to add to their hoards. Regiments carried large stocks of clothing and equipment in their own trains; at Pukchon, one regiment was hiding 300 cases of C-rations among the men's duffel bags at the same time division was trying unsuccessfully to obtain operational rations. A regiment overrun near the Chosin reservoir lost ten to twenty truckloads of clothing. Critical types of ammunition would be concealed by one unit while badly needed by another. When first in Korea, the division headquarters could move with 25 trucks, but soon it took 50.

Irregular logistics in the Vietnam period were also essential to successful operations. The US military build-up in Vietnam began with acute shortages of spare parts in the United States, and there was no logistical organization in Vietnam capable of supporting the build-up even if the supplies had been available. Last minute changes in unit deployment often severely impaired the logistical effectiveness of pre-positioning supplies during this early period. Logistical units deployed concurrent with rather than in advance of the tactical units they were to support.¹⁵ US units of necessity depended on extensive cannibalization, trading of parts, modification of equipment and innovation. The units near Saigon could often trade or buy military needs from the market. Often a US unit outside the Capital District would station "expeditors" in depots or send a team to Saigon with a "shopping list" of spare parts and other equipment. Similar expeditions might seek creature comforts needed by the unit. These procedures continued well after logistic supporting organizations were in place as a matter of user perceived necessity.

¹⁴Westover (1955), pp. 185-186.

¹⁵Heiser (1974), pp. 8, 15, 18

Later the logistical system improved greatly. Spare parts and supplies were being shipped into the country in larger quantities, and distribution made under more secure and efficient circumstances. US units, even at the combat level, operated from a series of fixed or semi-permanent bases. As a consequence of "base living," many units became overburdened with creature comforts. Redeployment of a headquarters or unit to another base was often even more cumbersome than during the Korean period.

During this period ¹⁶, one systemic characteristic of supply with potential impact on use of irregular logistic procedures was the requisitioning procedure from Vietnam. For the Air Force, requisitions, went from forward air bases direct to the Defense Supply Agency (DSA), receiving high priority as operational requirements from a combat theater. Army requirements passed through the Army depot system and reached DSA as depot replenishment requirements, receiving very low priority. The result was a significantly more responsive logistic system for the Air Force.

Throughout the Vietnam conflict, the one year tour of duty resulted in logistics lessons being constantly relearned as experienced personnel completed their tours and were replaced. The problems associated with the quick turnover and inexperience of logistics personnel, the rapid logistic build-up, the constant experimentation with logistic organization and procedure, the use of many non-standard commercial items, and the lack of uniform standard of living all contributed to the practice of irregular logistic procedures.¹⁷

¹⁶ Based on comments by Brig. Gen. Winfield Scott, USA ret., a former senior Army Logistician.

¹⁷ Heiser (1974) Vietnam Studies, LOGISTIC SUPPORT, Department of the Army, pp. 8, 18, 30-31, 39, 44-46, 60-61, 134, and 181-187.

2.2 SELECTED RELEVANT ASPECTS OF THE CONTEMPORARY LOGISTIC SYSTEM

All of the military services operate their supply systems on a demand basis. The level of stock at a particular unit will vary based upon the demands of that unit for items on the authorized stockage list. Some helicopter units, for example, require more of a particular item than do others because of conditions on the airfield or base. Climate and the operational environment are factors which help determine the level of the supply of a particular part at the unit supply point (see Section 2 of Appendix B, Interim Report, for a more detailed discussion of the nature of demand, authorization, and the military supply system in general).

The levels of spare part stock at all Air Force bases are controlled automatically by mobile computers at each Air Force base. The same is true to a lesser degree at Naval air stations and on board aircraft carriers. The Army uses smaller, highly mobile computers at the unit level, linked to a larger system that has a better capability of handling inventories and stockage levels.

Unit receipt or satisfaction of the item requested depends upon the stock availability of the item. Stock availability means that the item requested is available for issue when asked for. It becomes a statistic that tells supply managers how many times a part is available on a first-time ask basis. Further, the Stock Availability Rate is the standard Department of Defense performance indicator used to measure the effectiveness of the wholesale supply system. The Department, however, does not prescribe a specific Stock Availability Rate that should be attained by all services. Instead, each service establishes its own rate (goals) based on need, economic considerations, and funding limitations.

Unfortunately for the purposes of this study, stock availability in the data which follows is defined at the depot level. Thus, the figures do not take into account items available at depots but not

available in unit or base supply. Such items will normally not fulfill the demands of unit-level personnel, such as aircraft mechanics, for supplies when needed. Hence, the Stock Availability Rates providing the incentive to use irregular logistic procedures at the unit level are probably significantly lower than those cited below.

The overall Stock Availability Rate goal established by the Army is 85% for normal supply demands. The other services have similar goals. Thus, the services seek a situation in which approximately 15% of military supplies will not be immediately available through regular procedures when requested at depot level. Actual attainments by the services are contained in a document entitled the MILSTEP Highlight Table. An excerpt from the latest table indicates that service Stock Availability Rate currently ranges between 74-79%.

STOCK AVAILABILITY RATE
(All Services for Period Shown)

<u>Percent Supply Effectiveness</u>	<u>3rd Qtr. 1978</u>	<u>3rd Qtr. 1979</u>	<u>FY 1979 (first 9 months)</u>
Army	76.8	78.7	77.3
Navy	74.8	73.7	74.2
Air Force	78.0	78.6	78.2
Marine Corps	70.6	76.3	76.4

The Stock Availability Rates for specific helicopter systems or for helicopters in general, even at depot level, are not available. The closest approximation obtainable to those rates (still at depot rather than unit levels) are the NORS Stock Availability Rates¹⁸ of agencies charged with the stockage and fill of helicopter parts. The

¹⁸NORS demands are demands for parts for aircraft inoperable due to lack of parts, and are viewed as more urgent than normal demands on the logistic system.

chart below shows the NORS Stock Availability Rate from TSARCOM, a sub-command of the Department of the Army Logistics Command (DARCOM). TSARCOM figures include many kinds of authorized aircraft parts as well as many other diverse items for other equipment. The high priority given to TSARCOM in the supply of aircraft parts is reflected in the overall totals shown:

TSARCOM NORS Stock Availability Rate
(Goal 90%)

Jul 79	78.9%
Aug 79	83.1
Sep 79	81.6
Oct 79	81.6
Nov 79	81.2

A factor inflating NORS Stock Availability Rates compared to the actual situation at the unit is the fact that use of irregular procedures to obtain parts, and thus keep aircraft from being reported NORS,¹⁹ will prevent the demand for those items from being reflected in the NORS Stock Availability Rates.

Appendix B, the Interim Technical Report, cites Navy availability rates somewhat lower than those reflected above (and more in line with what would probably be expected for all demands, as opposed to NORS demands, at unit or base level as opposed to depot level).

2.3 IRREGULAR LOGISTIC PROCEDURES FOR MILITARY PURPOSES AND FOR PERSONAL GAIN

Throughout this study, as required by the study objectives, emphasis has been placed on the application of irregular logistic pro-

¹⁹There is considerable command pressure at the unit level to avoid having a significant NORS rate.

cedures for military purposes, specifically mission accomplishment. The study findings indicate that, at least in helicopter units, the incentive of accomplishing a military mission is the most influential in the decision to use irregular or prescribed logistic procedures in a given circumstance. However, there is also evidence that the use of irregular logistic procedures for military purposes may increase the propensity to use such procedures for personal gain. In addition to the detrimental effects of irregular logistics noted earlier, this tendency must be viewed as one of the drawbacks of keeping irregular logistic procedures "in the closet," e.g., implicitly accepted for some uses by local commanders but not recognized as a phenomenon of military operations.

In the immediate post World War II period, a graphic illustration of irregular logistics transitioning from beneficial military uses to highly detrimental uses was noted by then Lt. Col. Creighton Abrams. This incident was related by General Abrams to his Staff Judge Advocate (the senior lawyer on his staff):²⁰

Shortly after World War II, I (General Abrams) commanded a tank battalion in Germany. One Sunday, I stopped at a Post Exchange (i.e., non-military) gas station on the autobahn. I noticed a gasoline tanker (truck-trailer) from my battalion stopped for coffee. Upon questioning, the sergeant driving the truck responded that he was "making a delivery." My subsequent investigation resulted in the court-martial of a battalion supply officer and several other officers and enlisted men. It seems that, about a year and a half earlier, the unit had badly needed a windshield to repair a vehicle, and had been unable to locate it through regular logistic channels. A German civilian had offered to provide the windshield in return for a five-gallon can of gas. This exchange appeared to be to the advantage of the U.S. Government, and it was consummated. Next it appeared that the gasoline could be exchanged for money--which they pocketed.

²⁰Major General Lawrence H. Williams, currently Assistant Judge Advocate General of the Army.

At the time General Abrams discovered the operation, it was converting some 70-80,000 gallons of gasoline a month into money for the pockets of the defendants.

3.0 THE SOCIOLOGICAL DIMENSION

Sociology, the study of human relationships in groups, provides perspectives which can be applied to all organizations and operating systems which include human participation. Military sociology developed after World War II to focus general sociological concepts on military organizations and the informal social relationships which exist within the military. No study of the past three decades, however, has directly focused on the sociology of groups within military logistic systems in terms of the incentives for the use of irregular logistic procedures. The only significant source of insights into the irregular logistic phenomena within existing sociological research is the study of the interactive behavior of servicemen in military units and small groups. Three topics within the military sociological perspective--roles, group norms, and communication networks--appear to be the most relevant to the analysis of irregular logistic procedures.

3.1 ROLES AND IRREGULAR LOGISTIC PROCEDURES

The concept of "role" is important to the study of the behavior of individuals involved in military logistics because roles define the requirements which the military organization and the social system impose on individuals.²¹ Psychologists, sociologists, and anthropologists have devised numerous definitions and approaches to the role concept.²² Among sociologists, "role" has been defined as the set of expectations which group members share concerning the behavior of a person who occupies a given position in the group, and the behavior which an individual directs toward fulfilling these expectations.

²¹Katz and Kahn (1978), p. 171

²²Role theory as a psychological approach to the incentives related to irregular logistic procedures is discussed in Section 4 of this appendix.

3.1.1 Formal Roles

The existence of formal roles is inherent in the modern armed forces. The armed services are complex organizations which require the direction, management, and coordination of numerous personnel in order to function properly. Morris Janowitz characterized the organizational doctrine of the military as accomplishing these tasks through the following means:

- Direct lines of formal authority
- Explicit definition of mission
- Clear channels of official communication between staff and operating units
- Limitations on the span of control.

This organizational doctrine adheres closely to the ideal model of bureaucracy proposed by Max Weber during the early 20th century.²³ Weber's classic analysis described such organizations as characterized by formality, impersonality, specialization, a hierarchy of offices and authority, and a controlling system of rules and regulations. Since the source of authority in Weber's ideal bureaucracy is derived from impersonal rules and regulations, authority is vested in individuals only to the extent that they conform to their formally-defined offices and functions. Thus, the formal system defines rank-ordered functions and prescribes behavior in its rules and regulations--formal roles--pertaining to these functions.

Despite the similarities, Weber's theoretical model for bureaucracy should not be viewed as the explanation for all of the characteristics of formal roles in military organizations. Current sociological analyses have noted the influence exerted by informal structures in shaping roles. Thus, subgroups of the military, and specific individuals,

²³Janowitz (1965), p. 116.

require and expect particular behavior deemed appropriate for the performance of a given formal role. Individuals act to fulfill requirements and expectations transmitted informally with the belief that such activity will make the system work.

The potentially conflicting pressures of formal roles in the military organization can be observed in the situation of a company supply clerk. The supply clerk's formal role, as defined by various rules and regulations, prescribe the clerk's functions and procedures in ordering, stocking and distributing supplies to the unit in terms of maintaining accountability for the supplies. At the same time, the members of the company expect the supply clerk to expedite the receipt and distribution of supplies in order to meet unit mission and personnel welfare needs. Both sets of expectations and prescriptions--those concerned with maintaining accountability and those concerned with meeting unit needs--constitute the behavior anticipated of the individual occupying the formal role of company supply clerk.

A continual process exists in which the individual is socialized into the formal role, informed about the acceptability of behavior, and corrected as necessary. One method through which this is accomplished is the granting and denial of "esteem" to the occupant of a formal role. Esteem can be defined as a personal value acquired by the occupant of a role, derived from meritorious performance. It differs from "prestige," the impersonal value attached to a position regardless of who occupies it.²⁴ The presence or absence of esteem is a major factor in determining the extent to which the occupant of a formal role can exercise the functions of office. For example, the field study conducted in support of this study confirms that an overwhelming majority of the servicemen responding (approximately 90%) believe that their work groups encourage compliance with the wishes of respected or well-liked superiors, but

²⁴Coates and Pellegrim (1965), p. 119.

they are evenly split as to whether their work groups encourage or discourage compliance with the wishes of superiors who have not earned their respect or liking. Thus we might expect that an occupant of a logistic role who fails to acquire the esteem of the unit will be more likely to be circumvented by the members of the unit than a comparable individual in the logistic system who has acquired the esteem of subordinates.

Another means of transmitting role expectations is training. Formal training given to supply and maintenance officers and personnel often emphasizes the "can do" aspect of their work, and thus emphasizes effective performance in terms of results achieved rather than adherence to formal procedures. When formal procedures are perceived as less capable of producing results than informal procedures, this emphasis in formal training may reinforce the use of informal and irregular logistic procedures.²⁵

3.1.2 Informal Roles

Individuals in the armed forces often play a variety of roles in military society in addition to their formal, organizationally-defined role. Logistics work, for example, required many of the skills and expectations of the civilian business administrator . . . an image not always admired by the military personnel who must conform to it.²⁶ Indeed, the informal roles adopted in logistics may conflict with aspects of the formal role. The "scrounger" may view himself or herself as an exemplary serviceman because he or she is displaying the traits of initiative and effective performance associated with the role of "good" soldier or sailor. As with some forms of occupational crime, the "scrounger" may maintain a self image of being a heroic figure, defending

²⁵Turner (1947) p. 345; Nelson (1977) p. 12.

²⁶Lucas (1973).

the interests of his or her work group against the inertia of an impassive bureaucracy.²⁷ Friendship patterns and the human element of wanting to help one's co-workers also contribute to informal roles which include the occasional use of irregular logistic procedures as part of the normal role expectations.

The "exchange" system is an example of an informal system with prescribed roles that can operate against the formal logistic hierarchy. The individual who trades unit supply surpluses to make up for unit supply shortages must conform to behavior patterns that approach the rigidity of formal role functions. The "exchange system" maintains its own code of behavior and its own moral system, as well as its own set of sanctions against deviant behavior and rewards for conforming behavior.²⁸ Thus, adherence to the requirements of these informal roles helps to explain and shape the patterns of prevalent irregular logistic phenomena.

3.2 GROUP NORMS AND RELATED FACTORS

Group norms and values in the armed forces can be examined to determine what, if any, standards of group behavior motivate the individual toward the use of irregular logistic procedures. "Norms" can be defined as the general expectations for conforming behavior acting on members of a group. Norms differ from "values" in that values are more generalized ideological justifications and aspirations.²⁹ The analysis

²⁷Clinard (1974) Sociology of Deviant Behavior, esp. p. 313.

²⁸Turner (1947), p. 346. During an early interview in the present study, an Army mechanic observed, "If you're going to scrounge, you've got to uphold your end of your bargain too. If a guy's given you a part, he's given it to you in good faith, and he's under the impression that this guy will give it back."

²⁹Katz and Kahn (1978), p. 37.

of group norms and values in the current study addressed such questions as:

- Among aircraft units and support units, are group members in agreement over granting the highest priority to flight safety?
- How strong is the group support for adherence to regulations without question at all times?
- To what extent do groups support the use of irregular logistic procedures to improve group living conditions?

3.2.1 The Primary Group and Irregular Logistic Procedures

The sociological models for analyzing attitudes and behavior have been the primary group and the reference group. The classic definition of primary groups is,

groups...characterized by intimate face-to-face association and cooperation. They are primary in several senses, but chiefly in that they are fundamental in forming the social nature and ideals of the individual.³⁰

Groups which are not "face-to-face" are considered reference groups.³¹ Military life, providing a large variety of situations in which people are in relatively close contact, emphasizes the influence of primary groups because of their persistent and durable patterns of social interaction.³²

The specific goals of primary groups in the armed forces and the broad patterns of their function are established by the formal military institutions. The manner in which these patterns are carried out and the success with which the group's goals are attained are largely dependent on the internal organization of the group.³³ Informal group

³⁰Cooley (1920), p. 23.

³¹Mannheim (1966), p. 266.

³²Davis (1949), pp. 289-307.

³³Williams (1954) Human Factors in Military Operations, p. 350.

standards contribute greatly to the functioning of the group. Primary groups establish norms to help the group accomplish its goals, help the group maintain itself, help the members develop "validity" for their opinions, and help the members define their relations to their surroundings.³⁴ This process is illustrated by an excerpt from an interview with a former Army mechanic:

This was my first time away from home. I was brand new and the fact is that airplanes--ones that big--just overwhelmed me. I was thrilled to death to be associated with any part of it. I was trying to learn from anybody... whatever advice anybody gave me, I kind of took as gospel.

An individual's relationship to the primary group goes far to explain why an individual responds to certain demands, expectations, and standards, and not to others. The use of irregular logistic procedures can be a result of an individual's determination to aid friends, boost unit morale and prestige, or simply to participate in the group work effort. Alternatively, the use of irregular logistic procedures for private welfare may reflect rejection of the norms of the primary group or an individual's need to strive for prominence among the members of the group by acquiring more possessions. Thus, the potential influence of primary group norms on irregular logistic procedures has two dimensions:

- The extent to which the individual accepts the primary group norms as his or her own standards of behavior
- The extent to which primary group norms encourage or discourage the use of irregular logistic procedures in a given situation.

Primary group research has revealed that adherence to group norms is heavily dependent on the interpersonal ties within the group. Under varying conditions (e.g., basic training, combat, high stress environments), it has been noted that social cohesion is based to a

³⁴Cartwright and Zander (1968), p. 142.

large degree on the strength of interpersonal relationships, and that these relationships tend to increase with the importance of the mission and the threat of danger.³⁵ In situations where the group's mission is perceived to be important, the identification of the individual with organizations larger than the primary group becomes less influential.³⁶ Thus, when the need to follow prescribed procedures is perceived to conflict with the requirements of success for the group's mission, there is a tendency--accentuated under combat or other high-stress conditions--to adhere to the primary group's norms. Depending on the nature of the group norms, this may lead to increased use of irregular logistic procedures. The corollary is that, when the use of an irregular procedure conflicts with group norms favoring mission accomplishment or the maintenance of safety, the use of prescribed procedures will be strongly reinforced. This corollary is vividly illustrated by survey findings in the present study in which approximately 70% of all servicemen reported that their work groups actively discouraged the use of irregular procedures which reduced flight safety under combat conditions, even if the group members themselves did not fly in the aircraft.

A few of the sociological factors affecting the extent to which primary group norms encourage or discourage the use of irregular logistic procedures in a given situation are discussed in subparagraphs 3.2.2 and 3.2.3, below.

3.2.2 Risk-Taking Norms and Irregular Logistic Procedures

One feature of primary group dynamics directly related to the use of irregular logistic procedures is group risk-taking norms and behavior. This is due to the fact that initiating or accepting the use of irregular logistic procedures may involve a certain amount of risk,

³⁵See, for example, articles by Seaton and by Little in Janowitz (1964).

³⁶First noted by Shils and Janowitz (1948), p. 281.

e.g., discovery by enforcement authorities. Once an irregular procedure has been initiated, the process of group cohesion can work to assure the instigators and participants that such action is within the normal realm of behavior. Rationalization or other forms of reinforcement can condition the individual to believe that future use of irregular logistic procedures will tend to be condoned by the group. Sociologists have noted that a greater degree of risk taking occurs after group discussion and interaction, and that an informal social atmosphere within a work group fosters an illusory sense of being protected against the power of enforcement authorities (e.g., "we're all in this together so they can't punish any of us.").³⁷

3.2.3 Group Norms and Responsibility for Property

Since combat conditions or their equivalent in peacetime tend to heighten group cohesion, such conditions tend to intensify the sentiments which regulate the group's use and disposal of supplies and property. When a commander is held personally responsible for lost or damaged U.S. Government property, the group norms regarding the use of property may vary depending on the group's perception of the officer. Good management of property by the commander who has earned the esteem of his or her subordinates can result in the support of the unit to ensure that shortages do not occur (or at least are not detected). The perception of mismanagement, combined with an absence of esteem, can increase the cleavages between superior and subordinate and reduce group support of the accountable use of property.

Group norms toward personal property are often different from norms regarding the use of military property. "Personal" property--including supplies issued to the individual rather than to the group as a whole--tends to become "sanctified" by exclusive and proximity of

³⁷ Janis in Cartwright and Zander (1968).

ownership. It is often zealously guarded, accurately accounted for, and handled with greater respect than items issued to the unit as a whole. At the same time, the primary groups often generate a norm favoring the sharing of "personal" property within the confines of the group, as illustrated by the following excerpt from an interview with two aircraft mechanics:

Interviewer: What about borrowing your tools?

Mechanic A: Well, that's a different thing. I'm signed out for the tools and nobody comes to tell me that they want to take my tools!

Mechanic B: You do loan them, to a personal friend.

Mechanic A: Yeah, but we had people from other shops in our area. They would come up needing a tool and on occasion the tool never came back.

The limits of such sharing help to define personal relationships within the group and establish we/they relationships with outsiders (e.g., "our" people return tools but people from other shops are untrustworthy.)

3.3 COMMUNICATION NETWORKS AND IRREGULAR LOGISTIC PROCEDURES

The input of the human element in the logistic system is made possible by human channels of communication; in fact, the essence of the system is communication. Formal communication within bureaucracies flows in three directions:

- Downward communication, following the authority pattern of hierarchical relationships;
- Horizontal communication among peers at the same organizational level; and
- Upward communication, ascending the hierarchical ladder.

Formal communication networks, however, are not the only channels of communication existing in the military service. They are often integrated with, supported by, or challenged by an informal or unofficial communica-

tion network. Such informal networks of communication develop naturally from job-related contingencies and friendship patterns. These informal communication networks, according to Janowitz, are important for effective organizational control and are helpful in overcoming time lags in official communications and command.³⁸

Formal communication networks tend to mirror the chain of command; in contrast, informal lines of communication flow in all directions, cutting across chains of command. They often result from a combination of operational and social needs, and may contribute to the prevalence of irregular logistic phenomena. For example, two sociologists cite the case of a sergeant, aware of the shortage of an item necessary to operations, who wrote to a personal friend serving as an NCO in a distant military depot:

Dear Joe... We have a hell of a shortage of radio tubes for our C-47's over here. Please give bearer as many cases of these tubes as you can spare and we'll take care of the paperwork later.

The resupply of radio tubes arrived promptly, thus fulfilling both an operational need and the sergeant's mutual social need to affirm their friendship tie.³⁹

It should be noted that such informal networks, described by one sociologist as the "shadow world of military relations,"⁴⁰ operate vertically as well as horizontally. The acceptance of irregular procedures by some officers, for example, may be reinforced by the vertically-transmitted perception that "those who directly follow the formal structure and perform only the expected roles are not likely to break into the star ranks."⁴¹ Our field survey, however, indicated that consideration

³⁸Janowitz (1965), p. 118.

³⁹Coates and Pellegrim (1965), p. 10.

⁴⁰Sarkesian (1975), p. 46.

⁴¹Ibid.

of promotion is not near the top of the incentives for the use of irregular logistic procedures among most servicemen. More common, perhaps, is the informal transmission of the urgency to accomplish a specific mission, through informal hierarchical and horizontal channels of communication. This informal reinforcement of the need for mission accomplishment can be observed both in the circulation of rumors concerning the importance of the specific task at hand, or in a general atmosphere of urgency, as reflected in the following excerpt from an interview with a Vietnam era aircraft mechanic:

At that time, they were making the missions to North Vietnam, and it was up to you to get up and refuel them or they went down because they didn't have enough to get up, do their mission, and get back. So I think everybody felt a little concerned that way too. You knew these people--pilots and everyone else--personally. You'd see them walking out to the planes..."How're you doing?" It was a small base, you knew these people, and if you didn't get there to refuel them, they wouldn't get back.

4.0 THE PSYCHOLOGICAL DIMENSION

It is not possible to point to a single set of "triggering" psychological motivations as the only source of all irregular logistic procedures. Nor is it possible to identify a single personality type as being inevitably more likely to use irregular logistic procedures than other individuals: there is no "typical" scrounger. As noted in the main text of this report, irregular logistic procedures occur in a variety of situations, and each situation may call forth a unique set of psychological incentives and disincentives, acting on different individuals to produce variation in the use of irregular logistic procedures.

While it is impractical to map out the precise psychological dimension for each use of an irregular logistic procedure, it is possible to discuss psychological characteristics exhibited by a significant percentage of servicemen which contribute to the incidence of irregular

logistic phenomena in general. To use a parallel example, it is not necessary to examine the psychology of every member of a given military unit to know that certain measures will tend to raise the morale of the unit as a whole and that other measures will lower it; similarly, it is useful to be aware of the conditions of military service in general which tend to increase or decrease the psychological incentives and disincentives relating to the use of irregular logistic procedures.

Two perspectives on the psychology of the American serviceman contribute to an understanding of the psychological incentives and disincentives relating to the use of irregular logistic procedures. Role theory, a perspective derived in part from sociology and anthropology, examines the behavior of the individual in terms of what he thinks others expect of him. Motivational psychology, from which much of industrial psychology is derived, emphasizes the specific rewards and sanctions which accrue to the individual from pursuing a given course of action. Individually, they each explain part of the behavior manifested in irregular logistic phenomena; together, they provide a more complete picture of the psychological dimension supporting the use of irregular logistic procedures.

4.1 ROLE THEORY PERSPECTIVE

Despite its name, role theory is not a theory. It can best be described as a perspective in which,

The behavior of the individual is examined in terms of how it shaped by the demands and rules of others, by their sanctions for conforming and nonconforming behavior, and by the individual's own understanding of what his behavior should be.⁴²

Admittedly, this implies a doctrine of social determinism in which it is assumed that the behavior of the individual is shaped by social forces rather than by his or her own wants and needs. Role theory does not

⁴²Biddle and Thomas (1966), p. 4.

deny that individual differences exist, but it stresses the societal influences which affect the perceptions of all people who occupy similar roles in the context of the family structure, informal and work groups, military units, and communities.

In keeping with its partially sociological content, several aspects of the role concept have already be treated in Section 3.1 of this appendix. The following discussion of the role theory perspective focuses on two phenomena associated with role theory--the socialization process and role conflict--and their impact on the use of irregular procedures in the military.

4.1.1 Anticipatory Socialization and Logistic Roles

The term "socialization" describes the process through which the individual acquires beliefs and expectations, and perceptions of various social roles. The individual learns what is expected of him or her through interaction with the social environment, e.g., through contact with family members and friends, in the classroom, from books and mass media, etc. These sources of information about expected role behavior constitute the "agents of socialization." Considerable research has been performed on how important each of these agents are, and what kinds of information they transmit to the individual about various social roles adopted during military service. Consequently, there exists a sizeable body of literature providing insights on how the socialization process may affect the use of irregular logistic procedures.

Socialization indirectly related to irregular logistics phenomena may begin as early as childhood. Morris Janowitz, for example, in looking at the Korean War period, suggested that role concepts derived from the structure of the American family may be linked to difficulties encountered by recent enlistees in making a long-term adjustment to military authority and to the practice of following strict regulations.⁴³

⁴³Janowitz (1954), Appendix 101, pp. 11-12.

Other writers have sought to identify an "American national character" which prescribes opposition to work procedures established by management⁴⁴ or which prescribes personal honesty and Christian ethics.⁴⁵ These views have been countered, in part, by studies emphasizing the prevalence of "deviant" role concepts throughout the population. Women, the children of immigrants, members of minority racial groups, members of relatively isolated communities (e.g., Cajuns, coastal islanders, etc.), and the poor are now believed to undergo socialization processes in which the alleged "mainstream" American role concepts described above are not necessarily transmitted. In any case, the impact of such childhood socialization should not be overemphasized; it fails to provide a set of beliefs and expectations directly related to military logistics.⁴⁶

In contrast, adolescent contact with family and friends who have served (or are currently serving) in the armed forces is a major source of anticipatory socialization directly related to irregular logistics phenomena. Stories of military life tend to highlight exceptional incidents rather than dwell on the day-to-day routine of service duties, in part because the exceptional incidents are more vividly remembered. When logistics are the subject of such "old soldier" narratives, the tendency is to recount episodes in which supply or maintenance problems were overcome through personal initiative...in other words, through the use of irregular logistic procedures.⁴⁷ Widespread collection and display of "souvenirs" of military service, such as captured enemy equipment and unreturned U.S. property, provide physical evidence of the efficacy of

⁴⁴Williams (1954).

⁴⁵Drisco (1977), p. 3.

⁴⁶Lucas (1973).

⁴⁷A consultant to this study conducted an informal poll among ex-service-men in the business community of his home area and reports that all of the respondents identified a "scrounger" by name when asked, "Who do you best remember among the people in your old unit?" In some cases, this feat of memory was based on service as long ago as World War II.

irregular appropriation to impressionable adolescents. The net effect is to condition the future recruit to expect that the "scrounger" is held in high esteem in the armed forces and that a certain amount of use of irregular logistic procedures is a military norm.

Similarly, attitudes and expectations toward military logistics may be influenced by fictional depictions of military life in television, motion pictures, and novels.⁴⁸ With very few exceptions, such fiction presents irregular logistic procedures in favorable terms. For example, when "Corporal O'Reilly" in the popular television series M*A*S*H is depicted as consistently receiving his commander's approval for trading his unit's supplies for needed materiel from other units (or the black market), the potential military recruit may "learn" to expect that such behavior will be rewarded in the service.⁴⁹ Similarly, an individual asked to remember details of the series Twelve O'Clock High could recall only that "mechanics were always patching up the planes with chewing gum, stolen parts, anything to keep the squadron flying missions at full strength." Films and novels, such as the Americanization of Emily, Catch-22, and The Bridges at Toko-Ri, regularly have depicted far more amoral conduct, including theft of military supplies for personal gain or the misappropriation of equipment to construct illegal stills, with officers either condoning or insisting on such activities. The impact of these socialization agents is mitigated primarily by the fact that war films and military novels are not as popular among future service personnel as they once were. Lucas, for example, found that in 1972 expectations of the conditions of military service among students in Army ROTC tended to be extremely vague, reflecting little or no contact with socialization agents directly relevant to their future military careers.⁵⁰

⁴⁸See, for example, Moskos (1970), pp. 4-7.

⁴⁹In fairness to the creators of M*A*S*H, the series has aired episodes vividly depicting the negative consequences of irregular logistic procedures in terms of disruption of supply, hidden shortages, etc.

⁵⁰Lucas (1973).

4.1.2 Military Socialization

When an individual enters the armed forces, attitudes and expectations relevant to logistic procedures become more sharply defined. Military socialization supporting the use of irregular logistic procedures is primarily a function of informal group norms, such as have been described in Section 3.2 of this appendix. Formal socialization that could counteract these norms, including instruction in military ethics and the practical advantages of following prescribed procedures, appears to vary widely among the various services and type of training received. It is also possible that lack of adequate training in the use of prescribed logistic procedures could foster a perception that the rewards of "going by the book" are ill-defined or nonexistent. This would contrast with the highly salient reward structure for conforming to informal roles that permit, encourage or demand the use of irregular logistic procedures in the name of mission accomplishment and/or group welfare. There is anecdotal evidence that some enlisted personnel in fact are poorly trained in the correct use of prescribed procedures that expedite receipt of supplies; sheer ignorance may be a contributory factor in some cases to the failure to use authorized procedures.

It should be noted that formal military socialization can indirectly contribute to the adoption of roles that accept or encourage the use of irregular logistic procedures for mission accomplishment. Army officer training, for example, has been demonstrated to instill the perception that personal initiative and accomplishment of the mission at any cost are highly prized values.⁵¹ When a choice must be made between following prescribed procedures or exercising initiative to accomplish the mission, officers who have responded well to formal military socialization may tend to choose the latter. Similarly, the same socialization process has been identified as the source of a "cult of

⁵¹See, for example, Petersen (1974) Against the Tide.

perfection," in which many officers adopt a role-image in which "zero defects" or the attainment of a statistical measure of achievement (e.g., an unusually high O.R. rate for aircraft) is accepted as the primary goal of personal and unit performance.⁵² This tendency can be observed as a driving factor in some irregular logistic procedures.

4.1.3 Role Conflict and Irregular Logistic Procedures

Role conflict, as well as adherence to roles, may be a factor contributing to the incidence of irregular logistic phenomena. Role conflict can be defined as the simultaneous occurrence of two or more roles such that compliance with one makes compliance with the other more difficult.⁵³ In some cases, compliance with one role can make compliance with another, equally valid, role impossible. Turner, for example, posed a classic case of a long-standing organizationally-created role conflict in noting that a Navy disbursing officer on shipboard often found conflicting demands placed on him in his dual role of representative of the Navy's cost-accounting bureaucracy and subordinate to the ship's commanding officer.⁵⁴ More recently, researchers have noted the conflict between the preferred role of highly-trained, highly-skilled technician or officer, capable of independent judgment in his or her specialization, and the role of being subordinate to the regulations promulgated by higher command and support staffs. This role conflict has been shown to result in a high degree of frustration and a reluctance to perform necessary paperwork.⁵⁵

Not all role conflicts result in merely frustration or occasional confusion. Adams has suggested that "irrational behavior" in some military executives can be partially explained by the conflict

⁵²Authors citing the existence of this phenomenon include Westmoreland (1970); U.S. Army War College (1970); Sorley (1976); and Adams (1976).

⁵³Katz and Kahn (1978), p. 136.

⁵⁴Turner (1947).

⁵⁵Franklin, Braybrook et al. (1968), p. 13.

between the subordinate role forced on officers by assignment to staff functions and the self-assigned role image of being an action-oriented officer capable of independent command.⁵⁶ One phenomenon associated with this aspect of role conflict is "turf defense," in which a subordinate zealously guards his or her limited sphere of authority from encroachment by superiors and peers. An example of such turf defense is the well-known technique in which a subordinate will make convoluted use of regulations and manuals to defend his or her management practices from criticism by nominal superiors. In this case, "turf defense" may actually lead to reinforcement of the use of prescribed procedures, as well as to increased use of irregular procedures.

In extreme cases of role conflict, the use of irregular logistic procedures may be a symptom of resentment or vindictiveness against the organization which has imposed conflicting roles. A study of the behavior of U.S. servicemen in postwar Berlin reported that irregular--and even criminal--activities were stimulated in part by resentment against the failure of the Army to demobilize some draftees at the end of the war; in other words, to reconcile the conflict between being a dutiful soldier and a "soldier for the duration."⁵⁷

4.2 MOTIVATIONAL PSYCHOLOGY PERSPECTIVE

Motivational psychology assumes that behavior is controlled by the individual's response to a variety of psychological and physiological needs. Different authors have compiled various lists of these basic needs, but all agree that the individual can be viewed as motivated by the reward structure of the environment--the extent to which needs can be met through work, family life, recreation, and social contacts. In this perspective, man is a goal-seeking individual and incentives are

⁵⁶Adams (1976), p. 20.

⁵⁷Janis (1968).

effective only when they help individuals to achieve some goal or satisfy a real or imagined need.

4.2.1 Job-Related Incentives and Irregular Logistic Procedures

Research in industrial psychology suggests that the failure of a work assignment to provide certain psychological incentives can result in behavior which violates organizational norms and may involve the use of irregular procedures.⁵⁸ Incentives cited frequently in descriptions of military work assignments include the following:

- The importance of the work for the nation, patriotism;
- Self-actualization (in the military situation, the need to contribute effectively to mission accomplishment, or to prove individual and unit competence);
- The opportunity for personal responsibility on the job;
- The opportunity for recognition and promotion; and
- Competition with other individuals or work groups performing similar duties.

The degree to which these incentives motivate individual behavior varies according to the personality of the individual, age, rank, and the nature of the specific military situation.⁵⁹ Nevertheless, under most circumstances and for most individuals, the self-actualization incentive appears to provide the strongest motivation for job-related decisions in military service. For example, while competition between units is a normal phenomenon and often an effective incentive for performance, such competition may conflict with the requirements of inter-unit teamwork for mission accomplishment. Among American forces, at least, such circumstances will tend to lessen inter-unit competition as an incentive for behavior while maintaining self-actualization (i.e., mission accomplishment) incentives at a high level of saliency.

⁵⁸MacGregor in Fleishman (1967), p. 275.

⁵⁹See, for example, Lawrence (1972) and Rotondi (1976).

The extent to which irregular logistic procedures will be motivated by job-related psychological incentives depends on whether the individual perceives the use of an irregular procedure as fulfilling one or more of these goals. For example, if a servicemen believes that leading a "midnight requisition team" provides the opportunity to display initiative and courage, and to contribute substantively to mission accomplishment, which is lacking in the normal job assignment, then "midnight requisition" activities may become a preferred "job assignment." Similarly, if work performed "by the book" is unsatisfying because it requires too little skill, an irregular procedure may be adopted in order to demonstrate the serviceman's superior competence and creativity. Irregular procedures can be thought of, in part, as an ad hoc restructuring of work to respond to needs unmet in the use of prescribed procedures.

4.2.2 Personal Welfare Motivations and Irregular Logistic Procedures

In addition to the job-related incentives described above, most individuals are motivated by a set of very basic drives relating to personal welfare. These drives include the so-called self-protective motivations, of which the three most important are avoidance of trauma (physical harm and deprivation), the need for sleep, and the avoidance of mental and physical fatigue.⁶⁰ These self-protective motives can be disregarded by the individual for extended periods, but the individual can not survive unless they are eventually satisfied. Man does live by bread alone, if deprived of bread and other food for a period sufficient for the avoidance of trauma motivation to take command of behavior. Under conditions of deprivation, such as occasionally occur in military operations, self-protective motivations may override the disincentives against using irregular logistic procedures if such procedures are perceived as capable of responding to one of these basic needs.⁶¹ How-

⁶⁰Guilford and Gray (1970), pp. 90-91.

⁶¹See Seaton in Janowitz (1964).

ever, such circumstances are far from the norm and account for the use irregular logistic procedures only under desperate conditions.

More typical is the situation in which the individual or unit uses irregular logistic procedures to improve living conditions above minimum authorized levels. According to an Army manual on the subject:

Soldiers naturally tend to improve their living conditions at every opportunity; and will divert critical materials and potentially productive manpower to do so.⁶²

Social psychologists believe that the acquisition of comfort and money beyond the level needed to satisfy self-protective and security needs is similar to the drive to obtain promotion. In both cases, the operating incentives include the demonstration of superiority, the attainment of social approval, and the earning of respect. Thus, the tendency of military units to constantly improve their quarters--if necessary, through the use of irregular logistic procedures--can be viewed as motivated by the affiliative need to "do something" for the buddies in the unit, by the competitive desire to have better living conditions than comparable units, and by the physical need to avoid drafts and keep the weather outside by building solid walls and patching leaks.

Viewed from this perspective, the phenomenon of acquisitiveness among military personnel is a result of complex motives. An NCO at the time of the Army service club scandal of 1970 touched upon this point in explaining graft organized by Sergeant Major of the Army William Wooldridge:

Wooldridge's activities were nothing more than an extension of what was always expected of sergeants: something extra, a little something for nothing...There are a hundred ways for a smart sergeant to skim a buck here and a buck there and Wooldridge and his friends just expanded the opportunity a little.⁶³

⁶²U.S. Army Logistics Center (1977), pp. 4-6.

⁶³As quoted in Just (1970), p. 81.

Thus, even this uniquely clear-cut case of "greed" leading to irregular procedures breaks down into such motivations as the need to confirm NCO status through graft apparently perceived as "traditional" within a peer group, the need to demonstrate initiative and superior ability by "skimming" more than other sergeants, and the need to promote friendship ties by sharing the wealth and creating dependent relationships. The fact that military service limits the means of acquiring official status and recognition--i.e., through standardized pay scales and relatively standardized levels of authorized physical comfort--may increase the incentive among some individuals to acquire status and recognition through irregular procedures.

4.2.3 Intensification of Motivations for the Use of Irregular Logistic Procedures.

As noted earlier, the psychological incentives and motivations outlined above may vary in intensity as a result of conditions within the military environment. The clearest example of this is the situation in which a mission or an individual's life is endangered. Under these circumstances, motivations such as self-actualization, patriotism, a sense of duty and responsibility, and avoidance of trauma transform mission accomplishment and/or the maintenance of safety for self and for friends into the highest priority incentives. Both the reconnaissance research and the field surveys conducted during the course of the present study confirmed that many servicemen who believe that irregular logistic procedures were generally harmful to unit effectiveness supported the use of such procedures when missions or lives were at risk. Thus, when a unit's general mission is to maintain the maximum state of operational readiness/capability and the use of prescribed logistic procedures conflicts with this goal, there is a strong incentive for the use of irregular logistic procedures inherent in the situation.

Anxiety--a state of generalized fear or apprehension--is frequently encountered in military missions and may also intensify incen-

tives favoring the use of certain types of irregular logistic procedures. When a serviceman experiences anxiety or uncertainty, the "pack rat" complex may result in which the serviceman seeks to be equipped with everything needed to meet any contingency. Under such circumstances, the serviceman might not necessarily expect that the regular logistic system will fail, but the consequences of such failure in terms of the ability to accomplish a mission or meet self-protective needs constitutes a powerful incentive to engage in hoarding. Such hoarding is perceived as providing the individual with the maximum degree of personal control over an uncertain environment.

Under conditions of isolation, individuals tend to experience a greater need for affiliation and camaraderie,⁶⁴ and a greatly intensified desire for control over the environment. Activities such as unit hoarding of supplies (as opposed to personal hoarding), unauthorized trading with neighboring units, and unauthorized raiding of storage areas for group welfare purposes⁶⁵ may tend to increase when the members of a unit perceive themselves as relatively isolated and, consequently, more dependent on their own resourcefulness than the largesse of a distant and disinterested logistic organization. Further, as noted by Janis, isolation decreases the effectiveness of some disincentives against violating organizational norms by decreasing the likelihood of observation by enforcement authorities.⁶⁶

Not all situations which intensify psychological incentives related to irregular logistic phenomena are derived from military necessity. As noted by Adams, for example, a serviceman who remains at the same rank for too many years (or a junior officer or NCO of intense ambition) may become motivated by an intense drive for the recognition

⁶⁴See, for example, Schachter (1959).

⁶⁵Seaton (1964).

⁶⁶Janis (1968).

and security accorded by promotion.⁶⁷ The drive for promotion, thus intensified, may be sufficiently strong to overcome disincentives to engage in irregular logistic activities which--if not discovered or if condoned--may improve the likelihood for career advancement (e.g., the use of maintenance shortcuts to achieve an unusually high operational readiness rate). Curtis notes that the inability of bureaucracies to respond to greatly increased financial needs caused by family problems or excessive short-term indebtedness may lead to internal theft among otherwise honest personnel.⁶⁸ Referring to the prevalence of irregular activities in the Eastern European economies, Connor suggests that the sudden change from a tightly-knit community, such as a small town, to an impersonal bureaucratic environment (such as either an East European industrial area or military service) also creates a temporary sense of irresponsibility that may result in deviant or even criminal behavior.⁶⁹ All of these various findings indicate that, regardless of the specifically military conditions of service, the intensification of psychological incentives leading to irregular logistic procedures may still occur as a result of social and personal crises.

⁶⁷Adams (1976), p. 16.

⁶⁸Curtis (1973), pp. 37-38.

⁶⁹Connor in Field (1976).

APPENDIX B

LOGISTIC INCENTIVE STRUCTURES REFLECTED IN
IRREGULAR LOGISTIC PROCEDURES

Interim Technical Report
June 1979

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LOGISTIC INCENTIVE STRUCTURES REFLECTED IN
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(SHORT TITLE - INCENTIVE
STRUCTURES FOR IRREGULAR LOGISTICS)

Interim Technical Report
June 1979

by

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FOREWORD

The study of irregular logistic procedures breaks new ground. The subject generally is not reflected in published material. We have searched whole libraries without finding significant material identified with this subject. Yet, we have found relevant material in unexpected places. We believe readers of this interim report may have information which can contribute to improvement of our study. Consequently, we earnestly solicit comments and suggestions.

The Authors

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EXECUTIVE SUMMARY

BACKGROUND AND OBJECTIVES

1. In 1976 DARPA established a Logistics System Technology Program which included the following objective:

Develop a new set of logistics incentives for quickly and significantly reducing costs while maintaining or improving effectiveness within current logistics procedures.

In pursuing this objective, DARPA has contracted with Kappa Systems, Inc. (KSI) to accomplish a Study of Incentive Structures Reflected in Irregular Logistic Procedures.

2. KSI's study has the objective, in furtherance of DARPA's program, of investigating the nature of the incentive structures reflected in the use of irregular (unauthorized) procedures in the U.S. military logistic system. This is to be accomplished by selecting a single type of unit and conducting an exploratory study of carefully limited scope which can:

- Define the problem
- Establish pertinent specific and general hypotheses
- Test the specific hypotheses using a survey of selected military personnel
- Provide appropriate findings, conclusions, and recommendations.

This Interim Report is required to cover the first two elements above -- definition of the problem and hypotheses.

DEFINITION OF THE PROBLEM

1. Key terms used, the scope of this study in systemic and behavioral science contexts, and the basic concept of the incentive structure governing the use of irregular logistic procedures are presented in Section 1 of the Report. The initial discussion of the concept of the incentive structure emphasizes that every decision to use an irregular procedure results from the impact of situational and motivational factors on the individual decision-maker.

2. Section 2 concentrates on the pertinent aspects of the military logistic system, focusing on military helicopter supply and maintenance as the specific type of unit and activities selected for detailed observation, and including a brief look at phenomena associated with military logistics as a cybernetic system. The characteristics of the

U.S. military logistics system and the conditions in which it operates frequently result in a lack of timely demand satisfaction which creates a powerful motivation for the use of irregular logistic procedures.

3. Section 3 develops human aspects of the incentives behind irregular logistic procedures through a model of the individual decision making processes. Integration of decision points from this model with the incentive structure set forth in Section 1 provides the framework for analysis of a survey on the nature of the incentive structure which is to be administered as the next step of the study.

4. Section 4 of the report briefly notes the parallelism of a number of other large, centralized hierarchial systems to the military logistic system in terms of the existence of irregular procedures necessary to permit the systems to function effectively.

HYPOTHESES. Section 5 presents two types of hypotheses derived from the Definition of the Problem.

1. Specific hypotheses are those applicable in the analysis of supply and maintenance in helicopter units and potentially applicable to other military units, which can be meaningfully tested through the survey. Since this is an exploratory study, it is often necessary to hypothesize under what conditions various patterns will exist rather than hypothesizing specifically what the patterns are. Specific hypotheses fall into the following categories:

- Hypotheses With Respect to Different Types of Irregular Procedures which may be Used.
- Hypotheses With Respect to the Individual's Ability to Determine the Legitimacy of a Demand
- Hypotheses Concerning the Capability and Willingness of the Military Logistic System to Fill Demands
- Hypotheses Concerning the Role of the Chain of Command in the Use of Irregular Logistic Procedures
- Hypotheses Concerning Work Group Norms
- Hypotheses Concerning Individual Incentives and Disincentives
- Hypotheses Concerning Maintenance Short Cuts and Hoarding
- Hypotheses Concerning Decision Outcomes

2. General hypotheses are applicable only to the general subject of irregular logistic procedures, being too broad in applicability for significant testing within the scope of this study.

EXPECTED RESULTS OF THE STUDY. The results of the study will be based on the contents of the interim report and on the information obtained by analysis of the survey data developed in the next (survey) phase of the study. The study results are expected to:

- Help identify those irregular logistics procedures which are essential components of a military logistic system, along with the reasons why they are essential.
- Help identify those irregular logistic procedures which are not an essential part of a military logistic system, particularly those which are on a balance harmful.
- Use knowledge gained to suggest ways to maximize benefit from and to minimize any deleterious effects of the essential irregular logistic procedures.
- Discriminate between those situational and motivational factors which lead to use of both harmful and helpful irregular logistic procedures, so that helpful ones can be encouraged and harmful ones more effectively discouraged.
- Suggest ways in which the study of individual weapons systems can be accomplished to permit modification of the system or its associated prescribed procedures to induce the use of constructive irregular logistic procedures which will enhance operational readiness, and to inhibit the use of harmful irregular logistic procedures which will detract from operational readiness.

SECTION 1

INTRODUCTION TO THE PROBLEM

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1.1 INTRODUCTION

This introduction describes our general approach to the subject of irregular logistic procedures and briefly previews the contents of this interim report.

1.1.1 General Approach

The subject of irregular military logistic procedures is sensitive, easily triggering strong emotions and preconceptions. Consequently, it is necessary at the beginning to place this study in proper perspective. A study of irregular military logistic procedures could focus on criticizing those who get the job done when the going is rough. These are the people who do not hesitate, as Napoleon put it,

To improvise, replace one commodity by another,
and secure the troops provisions "by hook or by
crook"¹

Or it could focus on criticism of those whose limitations make it vital to use "by hook or by crook." This study engages in neither type of criticism. Rather, it is an analysis of a vital element in the struggle of capable and intelligent men, fighters and logisticians together against what Clausewitz

¹ Van Creveld (1977), p.56

termed "the friction of war"², and its peacetime equivalents.³

The guts of irregular logistic procedures is the attempt by the individual on the spot to overcome, through improvisation and ingenuity, systemic problems which cannot otherwise be resolved. These systemic problems characterize not only military logistics, but also many other endeavors in modern society. There are rogues and scoundrels on the fringes of such activities, as is true in any human operation; but deliberately criminal behavior is neither typical nor a major concern of this study. Of greater interest and concern are the types of irregular procedures that are equally likely to be condemned as "improper"--or condoned as brilliant, innovative, "cutting through red tape". In the nostalgic folklore of "our war"--for those who have been in one--the unit scrounger is remembered as a genuine folk hero. However, stripped of its human color and embellishments, much irregular logistic activity still exists as an irreducible core because of the inexorable systemic requirements of the phenomenon of war.

This study discusses what irregular logistic procedures are, why they are and why some of them must exist both in systemic and human terms. This study very briefly treats the whole logistic system, then concentrates on the incentive structure behind irregular logistic procedures associated with the support of operational helicopter units. The study suggests some things that ought to be done to bring irregular logistic procedures "out of the closet", to make appropriate ones recognized, controlled, and valued tools which can be wielded in a manner that maximizes their contribution to mission accomplishment and minimizes their abuse. As long as irregular logistic procedures remain "in the closet," there will be a tendency for the

²That all warfare consists of an endless series of unexpected difficulties--things that go wrong--is a commonplace, and is precisely what Clausewitz meant when talking about the "friction of war". Ibid., p.231

³These include budget constraints--anticipated and unanticipated--and other bureaucratic hurdles that today's higher level logisticians must face in providing adequate support to operational forces. During peacetime, when money must be saved, logistics support funds are among the most politically and psychologically attractive targets for budget cutters.

authorized supply system to fail to reflect demands for items obtained by irregular means. There also will be a tendency toward maldistribution of items in short supply, and toward warping of planned priorities. These can be significant sources of supply system malfunction. In some cases, attempts already have been or are being made to recognize and utilize measures previously designated as irregular (e.g., the use of controlled cannibalization).

As noted earlier, the purpose of this study is not to be critical of operators and logisticians who use irregular procedures to solve the otherwise unsolvable in carrying out their mission. This study is rather, an attempt to help make their task easier, better defined and understood, and more cost effective in order to help produce greater operational readiness and combat effectiveness.

1.1.2 Detailed Approach

The object of this interim report is to provide:

- A definition of the problem for development of the incentive structure leading to the use of irregular military logistic procedures. This is done in systemic terms for those aspects of the military logistic system which provide the environmental framework for the use of irregular logistic procedures. It is done in behavioral science terms using a model of the individual and his/her decision process for examination of behavioral and military incentive factors.
- Specific and general hypotheses with respect to irregular logistic procedures and the incentives behind them.

The report is divided into five sections:

- Section 1 provides the introduction, basic definitions, and scope of the study in system/subsystem and behavioral science contexts. The basic incentive structure leading to the use of irregular logistic procedures is then outlined.
- Section 2 concentrates on the pertinent aspects of the military logistic system, using abbreviated system models and flow charts to examine the problems of timely demand satisfaction, the definition of what constitutes legitimate demands on the system, and the development of maintenance procedures. This section includes a brief look at phenomena associated with military logistics as a cybernetic system.

- Section 3 develops the human aspects of the incentives behind irregular logistic procedures. This section first amplifies the description of demands on the logistic system to enhance clarity in model development. It then develops a model of the individual, indicating the external inputs and internal behavioral factors which operate to produce the decision to use irregular logistic procedures. This section focuses on the detailed decision process, and associates the decision points identified with pertinent elements of the incentive structure developed in Section 1.
- Section 4 briefly notes the parallelism of a number of other large, centralized hierarchical systems to the military logistic system in terms of the existence of irregular procedures necessary to permit the system to function effectively.
- Section 5 develops the hypotheses, specific and general, concerning the incentive structure leading to the use of irregular logistic procedures. The specific hypotheses are to be tested through a survey which constitutes the next phase of this project.

1.2

DEFINITIONS

An essential first step in discussing the potential incentive structure for use of irregular logistic procedures is to specify operational definitions of key words.

Incentive/Disincentive--an inducement affecting performance such as fear of punishment or expectation of reward offered to an individual or group to stimulate behavior. A reward or punishment which does not motivate or that has already been fulfilled would not constitute an incentive.⁴

Logistic support--the supply of definite quantities of physical means and services for activities that consume them, in order that the activities be maintained at specified present or future rates.⁵ It encompasses that range of activities defined (in JCS Pub. 1) as Combat Service Support (CSS).⁶ This study, however, places primary emphasis on two aspects of CSS: supply and maintenance. Helicopter logistic support, in this study, refers to supply and maintenance of parts, components, assemblies, tools, and other items perceived as necessary to the combat operability of military helicopters.

⁴Guilford and Gray (1970), p. 56.

⁵Morgenstern (1951), p.2.

⁶"The assistance provided operating forces primarily in the field of administrative services, chaplain service, maintenance, medical service, military police, supply, transportation, and other logistical services."

Military logistic system--the military organization and the associated personnel, installations, equipment, and procedures which provide logistic support in accordance with appropriate directives.

Demand--a claim for items or services to be supplied within a specified time frame. In the context of this study, a demand is thus used in the economic sense and should not be confused with other common uses of the term such as a direct order or an imperious request. A demand includes a requirement to perform a procedure (e.g., to adjust a tolerance).

Legitimate Demand--a legitimate demand on the military logistic system as used in this study is a demand for an item/service authorized for issue for an authorized purpose from an authorized source.

Irregular military logistic procedures--procedures for providing logistic support which are either specifically forbidden or are not authorized when other procedures to attain the same end are specifically prescribed. Irregular logistic procedures encompass both the use of nonstandard logistic procedures and the misuse of standard logistic procedures. To constitute irregular military logistic procedures, either the goods or services obtained must be of military system origin, or the use to which they are put must be military related.

Table 1-1 provides examples of such procedures.

1.3 SCOPE OF STUDY IN A SYSTEM/SUBSYSTEM CONTEXT

The scope of irregular logistic procedures and the incentives behind them addressed in this study encompasses four systemic levels.

1.3.1 All Complex Hierarchical Systems

The first level is the use of irregular procedures as a general systemic phenomenon in all complex hierarchical systems concerned with centrally controlled furnishing of supplies and/or services in response to decentralized demand requirements.

1.3.2 The U.S. Military Logistic System

The second level is the use of irregular logistic procedures as it occurs in the U.S. military logistic system. A broad typological description of military logistic procedures is presented in Table 1-2. The three underlined subcategories of maintenance, supply and time urgency of material readiness are those of primary importance in this study. While other categories receive some consideration, a detailed focus on them is outside the scope of this study.

Table 1-1

TYPES OF PROCEDURES AND ACTIONS ENCOMPASSED BY
THE TERM "IRREGULAR LOGISTIC PROCEDURES"

1. Taking items without authority
2. Unauthorized cannibalization
3. Intentionally submitting incorrect documents to obtain items or services
4. Unauthorized stockpiling of items
5. Unauthorized fabrication of parts
6. Unauthorized exchanges or use of items or services
7. Obtaining items or services from unauthorized (including nonmilitary) sources
8. Use of unauthorized maintenance procedures, including unauthorized levels of maintenance
9. Unauthorized operational use of equipment with maintenance or other deficiencies
10. Use of personnel for unauthorized purposes
11. Conversion to unauthorized purposes of authorized items or services
12. Use of gifts or favors such as liquor rations to facilitate one of the above

Table 1-2

PERTINENT ATTRIBUTES OF THE U.S. MILITARY LOGISTIC SYSTEM

Major Category	Sub Category ¹	Characteristic Variations
Type of logistic operations	<u>Maintenance</u>	Level of maintenance (organizational, direct support, depot)
	<u>Supply</u>	Level of supply (organizational, direct support, depot)
	Construction	Level of construction (in terms of magnitude, complexity)
	Transportation	Type (long haul, short haul, air, land, sea, etc.)
	Procurement	Types (competitive of various types, sole source)
	Other	As appropriate
Environmental Attributes	<u>Time Urgency of Materiel Readiness</u>	Minutes or hours vital (combat)--Time less urgent (garrison, operational units)--Time relatively immaterial (garrison, depot storage)
	Materiel Degradation	Frequent performance degradation of materiel loss (combat in unfavorable physical environment)--Indefinite preservation (controlled environment storage)
	Constraints on Logistics Support Facilities	Maintenance, storage, other operations in the open or under tentage--to operations in modern, well-equipped, permanent structures
	Constraints on Materiel Resupply	Isolated locations with periodic hazardous resupply missions to locations proximate to relatively inexhaustible resupply
Attributes of Materiel	Complexity	Thousands of interacting parts (helicopter or ship) to single part (bayonet)
	Cost	Hundreds of millions of dollars to a few cents
	Maintenance Requirements	Requires constant skilled preventive maintenance and repair activity--to requires minimal care (e.g., occasional cleaning, oiling)
	Equipment Density	High (one per individual or few individuals, such as small arms, trucks, field radios)--to low (tank retrievers, aircraft carriers, BMEWS radars)
Commonality	Service Commonality	Common to all Services, common to a group of Services, or Service unique.
	Component Commonality	Major item commonality (e.g., common air frame or engine), parts commonality (e.g., "X", parts commonality), other pertinent commonalities (e.g., mission commonality)

¹The underlined subcategories are those of particular pertinence to this study.

1.3.3 Operational Unit

The third level is the use of irregular logistic procedures as it occurs at the company, battalion/squadron and direct support or equivalent levels of military helicopter logistic support (principal focus of this study). Helicopter units were chosen as constituting a technologically advanced, high priority system common to all four Services.

1.3.4 Individual Operating System

Irregular logistic procedures can also be considered as they apply to individual operating systems (e.g., a specific weapons system). Considerations such as the specifics of designed maintenance procedures and the instructions for their use are involved at this level. This level of irregular procedures is recognized but not treated in technical detail in this study.

1.4 SCOPE OF STUDY IN A BEHAVIORAL SCIENCE CONTEXT

Two behavioral sciences, sociology and psychology, are essential to the understanding of the incentive structure behind irregular logistic procedures. After the brief discussion below, no special effort is made to differentiate military, sociological, and psychological perspectives. The models in Sections 2 and 3, however, provide a degree of natural differentiation into military system models (Section 2) and a human behavioral model (Section 3).

1.4.1 Sociological Aspects of the Analysis

The sociological dimension of the study examines the individual in the organizational setting (work group or unit). The factors (such as expectations, norms, values) which motivate individuals to use irregular procedures are based upon individual perceptions of the self, the group, the organization and the overall society. The entire spectrum of irregular logistic procedures is influenced by sociological factors. Three sociological perspectives are of particular interest in analyzing irregular logistic procedures.

1.4.1.1

Role

Briefly, pertinent role behavior may be explained in terms of:

- Prescribed role--written description of position
- Perceived role--what the individual wants to do in the position
- Performed role--what the individual actually does in the position.

The analysis of military role behavior is complex because: an individual role may consist of many activities; multiple roles may be incorporated into a single office; and multiple roles may be held by a single person. These roles can lead to role conflicts which affect the use of irregular logistic procedures. These role conflicts may be categorized in either of two ways. Intra-role conflict occurs within a single role when an individual is pressured by conflicting expectations from others (as when a supply sergeant must respond to a commander who wants an item, and a supply system S4/G4 (at a higher headquarters) who wishes to deny the item). Inter-role conflict occurs when an individual's hierarchical role (e.g., supply sergeant) is in conflict with an informal role (as just another member of a company). Different incentives operate upon the individual, depending upon his/her perceptions and performance of his/her role(s) in the organization.

1.4.1.2

Group Norms and Related Factors

In the military as elsewhere we must consider the individual's need to affiliate with a group. The attractiveness of a group, the pressures to conform, and the expectations and attitudes towards other groups and organizations are elements which, to varying degrees, influence individual and group behavior in different situations. Groups in the military will have norms--group expectations--relating to what is considered as appropriate conduct with respect to irregular logistic procedures. This group perspective is essential to a comprehensive analysis of incentives for the use of irregular procedures.

1.4.1.3

Communication Networks

The final perspective of concern in the incentive structure leading to irregular logistic procedures involves communication networks. Communication which flows up and down a hierarchical ladder is part of a formal network of communication, as opposed to an informal network in which communications flow in all directions. Formal communication networks include both command and technical (functional) communication chains. Informal networks include both task oriented and nontask oriented (e.g., friendship) communication chains. Communication through all channels produces feedback to the individual which is of motivational importance. Communication through these different chains may be conflicting or reinforcing. This communication furnishes emotional and social conflict or support which may strongly affect the individual incentive structure toward use of irregular logistic procedures.

1.4.2

Psychological Aspects of the Analysis

Two perspectives on psychology--role theory (discussed as a sociological perspective in paragraph 1.4.1.1) and motivational psychology--provide insight into the use of irregular logistic procedures.

1.4.2.1

Role Theory

Role theory emphasizes the patterns of behavior dictated by the individual's perception of the various roles in interaction with the environment. Socialization processes are particularly important in this perspective since it is through socialization that the serviceman (or any member of a large organization) develops expectations of behavior consonant with the assigned role. Irregular logistic procedures can be partially explained, under some circumstances, as the logical result of the process of acquiring and maintaining such roles. For example, the expectation that a military officer will place his/her military mission above all other values is developed during the early stages of a career. This expectation tends to impel the individual to accept the use of irregular logistic procedures rather

than risk failure, regardless of any specific benefits which may accrue to the individual as a result of success. Similarly, the expectation that the individual will be responsible for the welfare of "buddies in the unit, inculcated during basic training, helps to explain the altruistic elements in the use of irregular logistic procedures for unit welfare purposes.

Not all irregular logistic procedures result from adherence to an adopted role; some behavior can be traced to role conflict. An example is the use of irregular procedures to avoid the paperwork associated with prescribed procedures. As one individual discussing her experience as a military helicopter crew chief exclaimed:

That's what is frustrating: when you're a crew chief, you expect to work on helicopters, not be a secretary!⁷

In this instance, the use of procedures which would avoid filling out forms should be triggered by the individual's perception that paperwork is not properly part of a crew chief's functional role.

1.4.2.2

Motivational Psychology

Motivational psychology, in contrast to role theory, emphasizes the specific rewards and sanctions (incentives and disincentives) derived from pursuing a particular behavior. It implicitly assumes that some form of cost/benefit analysis, on either a conscious or subconscious level, is performed by the individual as a determinant of behavior. Motivational psychology is particularly useful in explaining irregular logistic procedures which occur as a result of either rational choice or self-centered motivation. For example, the use of an irregular logistic procedure to obtain many types of items for personal welfare usually involves the weighing of the risks of getting caught and punished against the benefits of a higher standard of living for the individual. Similarly, the use of irregular procedures to improve a unit's short-term operational capabilities can find one potential explanation in terms of a

⁷Reconnaissance Research, 9 April 1979

unit commander's drive to demonstrate superiority over peers during the short time available in command positions. Under certain conditions, including combat, various emotional stimuli may intervene in the cost/benefit analysis implicit in motivational psychology. Thus, the stress derived from the conflict between the goals of achieving a military objective and staying alive can impel individuals to make use of logistic procedures which they would avoid or even condemn under other circumstances.

Motivational psychology can also be used to explain irregular logistic procedures which occur when the initiator of the procedure derives little or no benefit from the items and services obtained. In such circumstances, the use of the procedure itself may lead directly to a valued goal. For example, the individual who wishes to enhance personal status as an unit scrounger may do so through the scrounging of items that someone else may need. The reputation of being an effective scrounger, rather than the items procured through scrounging, represents a "selfish" interest in making use of an irregular logistic procedure. Similarly, the irregular loan of military supplies without apparent concern for personal or unit gain may either reflect the traditional expectation of interdependence among servicemen or be a manifestation of a desire to "buy" friendship through cooperation.

1.5 THE LOGISTIC INCENTIVE STRUCTURE

Figure 1.1 presents the general concept employed in this study to describe the incentive structure governing the use of irregular military logistic procedures. When a specific demand for items or services is presented to an individual, his/her decision as to whether or not to use irregular logistic procedures is governed by an incentive structure consisting of situational factors, motivational factors, and the interaction between the two.

1.5.1 The Situational Context

The situational context includes the military logistic situation, the specific demand, and the applicable irregular procedures.

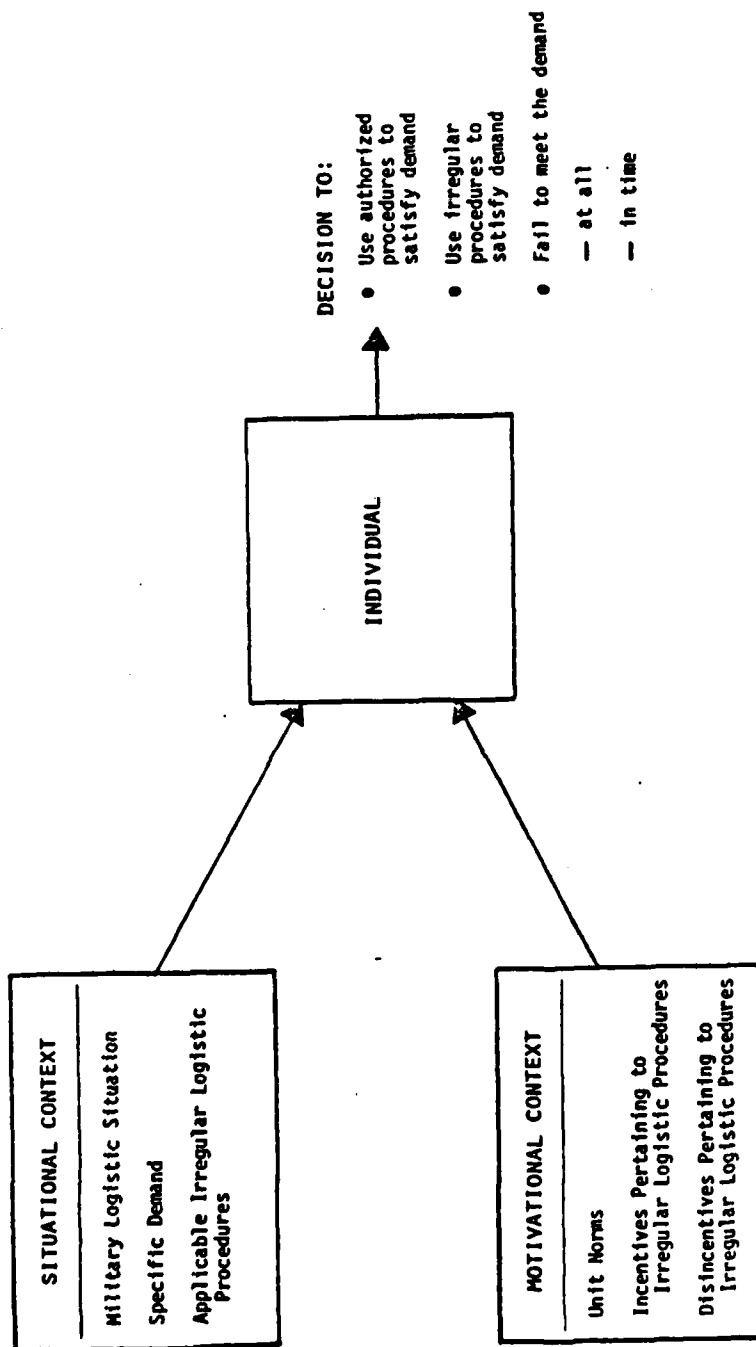


Figure 1-1. The Incentive Structure Governing The Use of Irregular Military Logistic Procedures

The military logistic situations considered in this study are set in the framework of combat versus garrison conditions. Within the framework, two elements define the principal set⁸ of military logistic situations.

- Authorization Status. Is the item authorized and available in time? (Section 2 is primarily devoted to information pertinent to this subject.)
- Nature of the Demand. Is the item or service essential, or does it at least contribute to the accomplishment of the mission? (This subject is discussed at the beginning of Section 3.)

For example, a situation may be defined as one in which a demand or service essential to accomplishment of the mission is authorized, but is not available through authorized logistic channels when needed. The second element listed under the situational context is the specific demand. This demand consists of the item or service required and the date and time by which it is needed. Section 2 expands on this subject. The irregular procedures applicable to a given demand, the third element of the situational context, come from the list of Table 1-1.

1.5.2

The Motivational Context

The motivational context is composed of the unit norms and the sets of incentives and disincentives applicable to a given individual. The unit norms displayed by the chain of command and peer groups are human factors, (things such as attitudes toward the use of irregular logistic procedures, toward duty and the mission and failure to accomplish the mission, toward what should be punished or rewarded through formal military and informal group rewards and sanctions). These norms may be reflected orally or (particularly for the chain of command) in written form as in SOP's.⁹ These human factors are included in the considerations of Section 3. The sets of incentives and

⁸As an example, another set of military logistic situations applies only in the case of procedural short cuts to specified maintenance procedures. This set differentiates between prescribed procedures which are difficult, complex, and lengthy and those which are easy, short, and simple. (See paragraph 3.4)

⁹Standard Operating Procedures

disincentives applicable to a given individual are discussed in Section 3. Section 3 uses a model of the individual and his/her decision process to develop the motivational context and its interaction with the situational context.

SECTION 2

PERTINENT ASPECTS OF THE MILITARY LOGISTIC
SYSTEM

SECTION 2

PERTINENT ASPECTS OF THE MILITARY LOGISTIC SYSTEM

2.1 GENERAL

Of particular interest in this section are three functions of the military logistic system:

- Timely Demand Satisfaction. The function of supplying an item or service, considered by the logistic system to constitute a legitimate demand, by the time it is needed by the user to meet operational requirements.
- Demand Legitimation. The function of defining what constitutes a legitimate (authorized) demand on the logistic system.
- Prescribing Maintenance Procedures. The function of developing the procedures to be followed in accomplishing maintenance of weapons systems or other operating systems.¹

For these functions, this study focuses on those aspects most relevant at the level of helicopter units and their proximate maintenance support units.

2.2 MODELS RELEVANT TO TIMELY DEMAND SATISFACTION

Logistic system models relevant to timely demand satisfaction are covered as follows:

- An elemental logistic system model (para. 2.2.1)
- Composite military logistic system elements (para. 2.2.2)

¹By other operating systems is meant any type of equipment oriented system not considered a weapons system; e.g., a portable generator which is used for general power supply purposes.

- Pertinent aspects of military helicopter units and their direct support maintenance and supply organizations (para. 2.2.3).
- Relevant cybernetic characteristics of interest in military logistic systems (para. 2.2.4).

2.2.1 Elemental Logistic System Model

The elemental logistic system of interest in the analysis of timely demand satisfaction as it affects incentives for irregular logistics is a simple one, as illustrated in Figure 2-1. It is a system designed to permit a user (e.g., a mechanic in an operational unit) to register a demand for supplies or services and have that demand satisfied by a source of supply (for materiel or services). This system is quite simple in concept, but provides the basis for subsequent more complex models.

2.2.2 Composite Military Logistic System Elements

The elemental logistic system represents the system as it goes from a single user to an organizationally adjacent single supplier. The system, in practice, goes from the user in the field through many intermediate logistic organizations to the procurement office or arsenal which is the ultimate military supplier. Figure 2-2 illustrates this process and indicates some of the types of logistic organizations characterizing these composite logistic chains. If intermediate logistic organizations can meet the demand from resources on hand, they are the source of supply for materiel or services to the user making the demand. If any of the logistic intermediaries need an item to replenish stock depleted in the process of functioning as a source of supply to those below them, they are the user to whatever higher logistic organization serves as their source of supply. When one of these logistic intermediaries cannot meet the demand from resources at hand, it functions merely as a relay station for demands and, as appropriate, monitors further transmission and demand satisfaction. If every valid demand

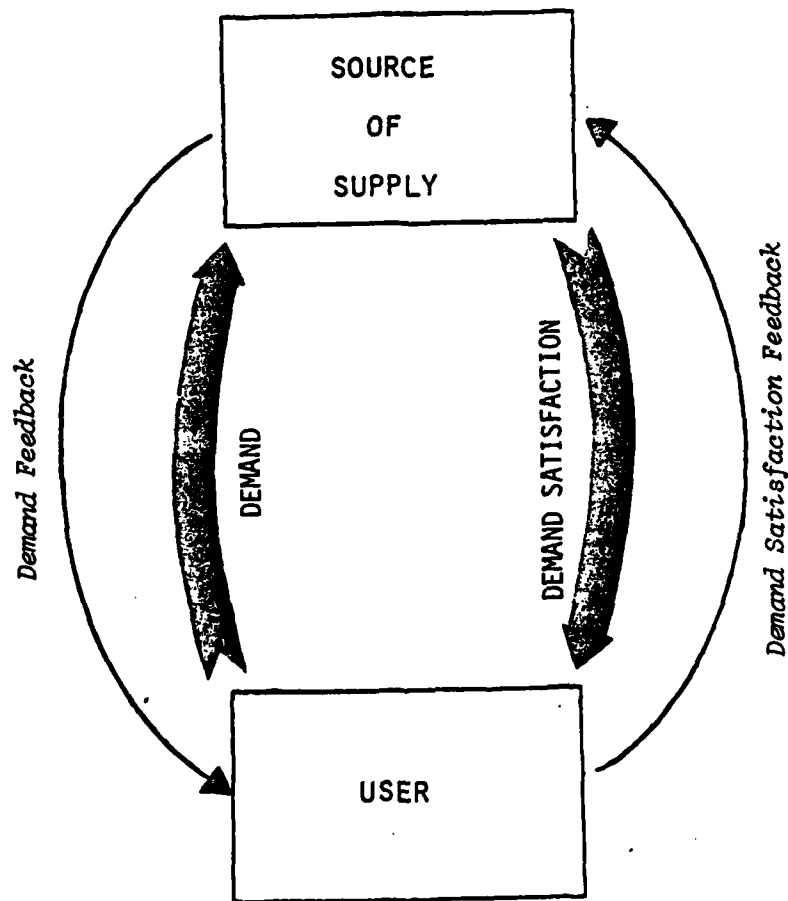
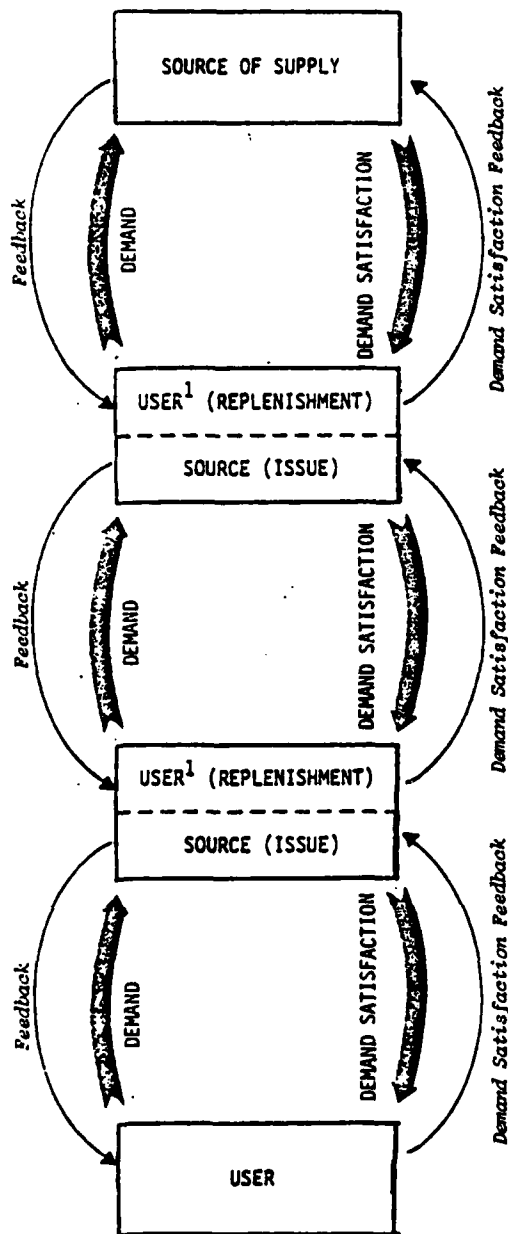


Figure 2-1. Elemental Logistic System.



Related Types of Logistic Organizations

Depot, Arsenal

Camp, Post, or Station
(Air Base)

General Support Unit
Replenishment Ships

Direct Support Unit
Aircraft Carrier

Battalion/Squadron
Ship (other than above)

Company/Troop

Maintenance/Supply
Platoon/Section

Individual Mechanic or
Other User

Figure 2-2. Relevant Composite Logistic System Characteristics

- ¹ Intermediate organizational levels (of which there may be several more than shown here) satisfy demands from lower organizational levels from within their own resources, then make demands on higher organizational levels to replenish their resources. Intermediate logistic levels function only as relay and monitoring stations when they cannot meet demands from available resources.

by every user could be satisfied by the applicable source of supply at the time the user needs the item or service, there would be no valid need for most irregular logistic practices. But the "friction of war" (which includes frequent changes in plans and situations forced by imperfect knowledge of enemy capabilities, as well as the element of surprise) and other factors create systemic problems that prevent timely satisfaction of many demands. Three aspects of these systemic problems are of interest in this respect.

2.2.2.1 What is Reasonableness in Timely Demand Satisfaction?

If the user could only be "reasonable" and wait until the logistic system could respond, one could design a system that would take care of all military logistic requirements on a preplanned basis. This could theoretically be done under peacetime conditions with thoroughly tested equipment and ample budgetary resources if logistic "reasonableness" could be given priority over operational requirements. But, in peacetime, budget resources are limited and operational requirements cannot always take second priority. In war, both history and logic confirm that, all else being equal, battles are won by those commanders who can cause their fighting troops and logistic support systems to fulfill the most "unreasonable" demands. This is a matter of using a maximum of effort, initiative, and ingenuity. Many irregular logistic procedures are essential tools in being able to fulfill such "unreasonable" but vitally necessary demands.² Most experienced operators and logisticians can also, however, point to instances where operational users over-rated the urgency or time-sensitiveness of their needs, producing demands which might properly be called truly unreasonable. "Monday morning quarterbacking" is often involved, however, in making such judgments. There will always be a marginal judgment area in this respect.

2.2.2.2 What is the Impact of Mobility Requirements?

No military force could move if every one of its units carried with it in the field all items for which the unit might have a need.

² Van Crevelde points out that the near success of the Wehrmacht in the Soviet Union in World War II was due less to the excellence of their preparations--the logistic problems were staggering--than to "the determination of troops and commanders to give their all, to bear the most appalling hardships and to make do with whatever means were given to, or found by, them." Van Crevelde (1977), p. 175.

This is a truism particularly reinforced by the increasing complexity and diversity of equipment characteristic of modern armed forces. This problem will be dealt with in more detail in Appendix A³ to the Final Report and receives unique coverage in Marshall, The Soldier's Load and the Mobility of a Nation (1950).

2.2.2.3 What is Current Availability on Demand?

Complex military equipment often involves tens of thousands of parts, most of them required very infrequently, many of them being costly. Given peacetime budget constraints (see note 3, p. 1-2), many demands in peacetime will not be satisfied when desired, no matter how efficient the logistic system and the planning for its use. As will be discussed in more detail in Appendix A to the Final Report, there is in general up to a 40 percent probability that an item will not be immediately available from the supply chain when requisitioned at the retail level.⁴ For example, from mid-1975 to mid-1977 the probability that a naval air item would not be available when requisitioned averaged 30-40 percent; for high priority Navy Closed Loop Aeronautical Management Program (CLAMP) items this probability averaged 16-30 percent.⁵ Even in wartime, economics, mobility considerations, and other factors will require that the system stock only to meet "average" demands. Consequently, it cannot meet the peaks in demands for stocked items nor the demands for unstocked items (items for which a low probability of having a demand occur is projected, or for which the cost is excessive considering the anticipated frequency of demands).

2.2.3 The Military Helicopter Unit and Its Supporting Intermediate Maintenance Activity

Figure 2-3 provides a generalized model of pertinent aspects of the repair and parts supply processes for military helicopters at the

³Appendix A to the Final Report will contain a brief historical commentary on the development of logistic systems which illustrates the continuity of many such logistic problems into modern times.

⁴Considering both demand satisfaction and demand accommodation for all items. This varies by Service and type of items.

⁵U.S. GAO, Letter to the Secretary of the Navy of 9 August 1978, ref. LCD-78-230.

unit and intermediate maintenance activity levels. This model brings system conceptualization to the working level of military logistics. Although the model emphasizes repair parts, comparable processes exist for special parts, end items, expendables, and maintenance services. It should be noted that the model is a composite of procedures existing in the various Armed Services; in reality, each Service varies in procedures and unit designations. For the purpose of the study, "helicopter unit" could represent an Army helicopter unit or a Navy, Marine, or Air Force helicopter squadron; an "intermediate maintenance activity" could represent a Navy Special Aircraft Service Shop (SASS), an Army intermediate maintenance unit, or an equivalent Air Force maintenance squadron.

The logistic system depicted in Figure 2-3 is activated when a unit-level helicopter mechanic receives a demand in terms of deficiencies in the operating capabilities of the helicopter to which he/she is assigned. The mechanic converts this demand for maintenance action into a demand on the parts supply system for the supply or repair of necessary parts. These repaired or replacement parts must normally be furnished within a specified time to permit meeting operational readiness requirements for the helicopter. The mechanic is thus in this case the primary user of the parts or repair services which the logistic system must supply.⁶

After receiving approval from the immediate supervisor (where appropriate) the mechanic transmits the demand for parts to the unit or section technical supply or parts clerk by verbally explaining his/her needs and priorities and often by hand-carrying the broken part as supporting evidence. The transmission medium is thus simple face-to-face contact between the mechanic and the source of supply--in this case, the technical supply or parts clerk. Feedback in this simple system is also accomplished by face-to-face contact between the user and the source of supply.

If the parts clerk can satisfy the requirement from existing stock, he/she does so. The parts clerk then becomes a user of parts, since the supply allowance stock has been incrementally depleted. The parts clerk submits a demand (with NCO or supply officer authorization, when necessary)

⁶As opposed to the aircraft crew, who may be considered the direct beneficiary of the parts or repair services in the case of aircraft repair.

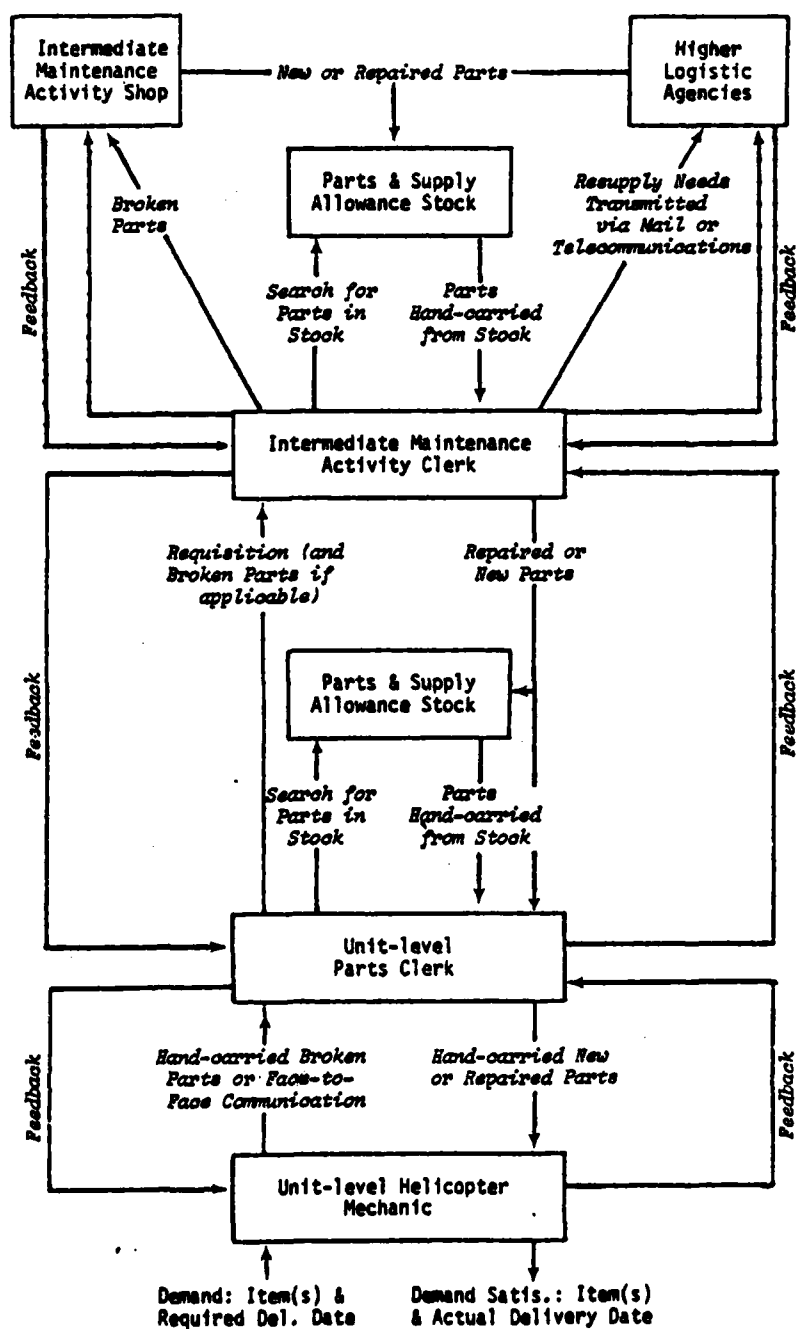


Figure 2-3. Generalized Military Helicopter Parts Supply and Repair System:
Unit-Level - Intermediate-Level Subsystem

on the next higher supply source for replenishment of the stock.

If the technical supply or parts clerk cannot satisfy the initial demand placed by the mechanic, the clerk effectively becomes a demand relay station by forwarding the demand to the source of supply. In this situation, the clerk may hand-carry the broken part and a written requisition for the item to the unit's intermediate maintenance activity (IMA). The IMA clerk responds by obtaining the required parts from IMA stock or, if the part is not available, by transmitting the demand through higher logistic system channels. If the demand is for repair services, the IMA clerk may hand-carry the broken part to the IMA repair shop. The shop, after completing repairs, returns the part through the IMA and parts clerks to the mechanic. If the demand is for replacement parts not available at the IMA level, the IMA clerk transmits the demand via ADP support systems, radio, mail or telephone to an office higher in the logistic hierarchy. Such offices may include a Defense Logistic Agency facility, an aviation supply office, a depot, or a parts control center, depending on the nature of the part and the varying procedures of the individual services. Feedback to and from the higher level logistic facility may be transmitted electronically or by mail.

2.2.4 Cybernetic Characteristics

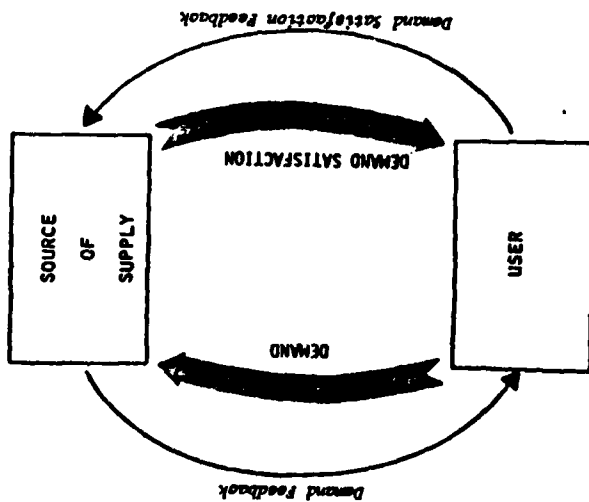
A military logistics operation can be viewed as a self-steering cybernetic system attempting to respond to a series of constantly shifting goals. These goals are defined by the constantly changing operational requirements (demands) for personnel, supplies and services created by both planned usage and the "friction of war." As a goal-seeking system, the logistic support system depends for its functioning upon a constant stream of information concerning its performance in order to define its relationship to (distance from) its goals. Goals (defined by demands on the logistic system) are externally derived and constantly changed. These changing goals are often beyond the predictive (or tracking) capabilities of that system or any other system to which it has access.

This basic cybernetic structure is reflected in Figure 2-4. In terms of the performance of the military logistic system under stringent operational conditions (especially combat), the characteristics of three cybernetic variables cited in Figure 2-4 will frequently be unfavorable. This will result in an inability of the system to provide timely demand satisfaction without some compensatory mechanism. Many irregular logistic procedures can be interpreted as attempts at self-correction or compensation by the system components. This perspective can be helpful in understanding the incentives for irregular logistic procedures. Looking at irregular military logistics from this viewpoint suggests that systemic incentives towards irregular procedures can be expected in any system similar to a military logistic operation, regardless of other psychological, sociological, and administrative incentives and disincentives in effect. As discussed in detail in Section 4, we can see such problems, for example, in military recruiting systems, in communist economic systems, in government social services systems, and in large-scale centralized industrial and commercial enterprises in Western economies.

2.3 THE MILITARY LOGISTIC SYSTEM LEGITIMATION PROCESS

The military logistic system legitimation process defines those items of materiel and services which are authorized for issue, to whom, and for what purpose. Figure 2-5 presents a simplified version of the process. Of particular interest in this process are the following:

- The number of items, including expendables, components and parts, which may be authorized for a unit with technologically sophisticated equipment such as helicopters, will run into the thousands or tens of thousands.
- Authorization for some items may be difficult for the individual to determine accurately at the unit level because:
 - Authorization may come from different levels.
 - Authorization for different types of items may come from separate directives.



Cybernetic Characteristics of Interest		
Cybernetic Quantitative Factors	Magnitudes Characteristic of Logistic Model	Impact on Likelihood of Meeting Goals
Load	High to Low	Inverse (i.e., "high" reduces likelihood of success)
Lead	High to Low	Positive (direct)
Lag	High to Low	Inverse

Other factors such as gain and the associated error function may impact, but they are of less pertinence than the following three:

Load, in terms of information, constitutes the extent and speed of changes in demands which the system is designed to satisfy. It is a measure of the saturation of the system; i.e., of the time varying amount and complexity of the demand. The higher the time averaged amount and complexity of the demands, the higher the load will be. Generally combat will tend to increase the load, often for critical items to the point of overstressing the system.

Lead is the amount of change in requirements between demand submission and demand satisfaction. It is a measure of the expected demand increment incurred during the time period between ordering and response. The "friction of war" tends to create unpredictable changes in the amount of lead required.

Lag is the expected time differential between user request and source-to-user response. The creation of excessive lag is particularly characteristic of the "friction of war."

Figure 2-4. Factors of Interest in the Military Logistic System as a Cybernetic System.

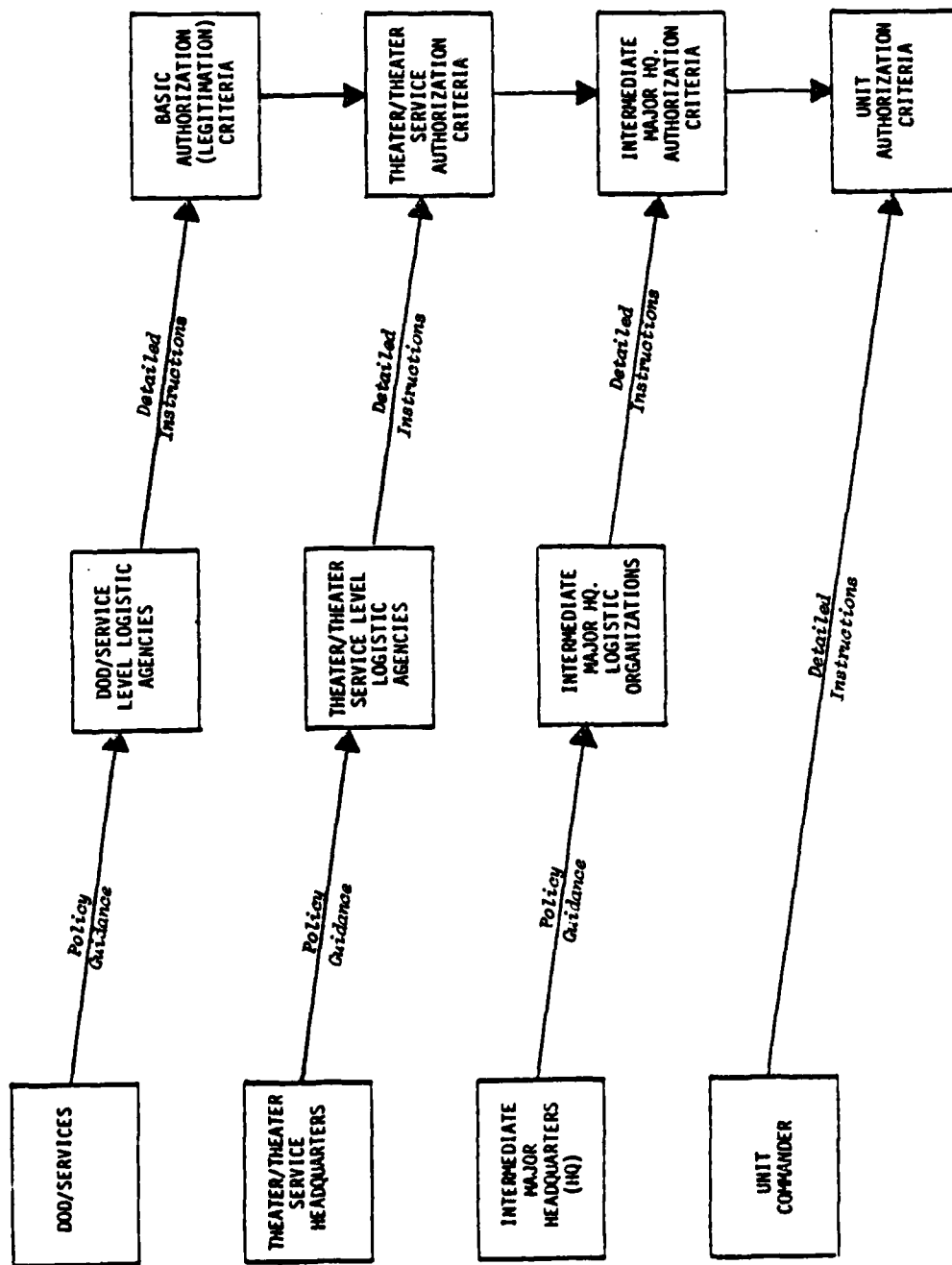


Figure 2-5. The Military Logistic System Legitimation Process.

- These directives may be different in form (e.g., supply manuals supplemented by SOP's supplemented by other types of correspondence).
- Not all items are covered by established authorization standards, particularly in combat. With reference to Vietnam, Heiser (1974) noted, "There is a need to establish standards of living for troops early in a campaign. Once the standards have been decided on, they should be binding on all troops of all services... In the absence of such criteria, every unit will establish its own standards, usually high; and constantly strive to upgrade them..."⁷

For a user, a legitimate demand is considered as one that will be filled by his/her source of supply. In an operational environment it is relatively easy, using equipment manuals, supplementary documents such as SOP's or memoranda, and frequent contact with technical supply personnel for a unit mechanic or maintenance NCO to learn what he/she can get from his/her technical supply section. That technical supply section has a similar relationship with its source of supply. For less frequently used, or less directly mission-oriented types of items, the uncertainty factor may rise.

A disadvantage of this approach is that the users inherit the errors of all of those above them in the supply chain. If someone in a theater service depot erroneously indicates an item is not authorized for issue, users at unit level will be scrounging for the item. Of course, if the unit users erroneously assume a demand is legitimate, they will be disabused of the notion as soon as they present the demand to their source of supply.

2.3.1 Authorization Status

Authorization status, as mentioned earlier, is one of the elements which defines the principal set of military logistic situations. Three alternatives exist for authorization status:

- An item or service is authorized and can be furnished when needed.

⁷pp. 259, 260.

- An item or service is authorized but cannot be furnished by authorized procedures when needed.
- An item or service is not authorized.

A user faced with a demand implicitly or explicitly arrives at an authorization status for the needed item or service. This is an important step in the decision to use a prescribed or irregular procedure in meeting the demand for the item of service.

2.4 PRESCRIBING MAINTENANCE PROCEDURES

Paragraph 2.2 in discussing the problem of timely demand satisfaction dealt with demands for items or services by a user on a source. There is another type of demand for a service which does not get presented to a source of supply by a mechanic acting as a user. This is the demand for the use of a maintenance procedure by the individual mechanic, which leads to a particular kind of irregular procedure--the maintenance shortcut. The individual involved uses a procedure of his/her own invention, or learned from some other individual, but differing from the prescribed maintenance procedure. This short cut will normally be used because it saves time and/or effort, but if done by someone who does not fully understand what he/she is doing, it can jeopardize safety. Some of these short cuts are unquestionably improvements, and if submitted as suggestions may become the prescribed procedures. Others are of less indisputable merit. All short cuts to prescribed logistic procedures, until submitted as suggestions and approved, qualify as irregular logistic procedures (albeit benign ones if there is no sacrifice in quality of results--particularly flight safety).

To provide background for use of such shortcuts, it is useful to note briefly certain aspects of the process used in developing and prescribing authorized maintenance procedures.

- The procedures are developed by a relatively few personnel of high technical qualification.

- The procedures must often cover many long, complex involved processes.
- The procedures are used by many personnel, many of whom are highly qualified technically, many of whom display considerable initiative, almost all of whom would rather do anything shorter, quicker, and simpler.
- The suggestion feedback--modification process by its nature tends to have a time lag of many months at best.

SECTION 3

THE INDIVIDUAL DECISION-MAKING PROCESS

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THE INDIVIDUAL DECISION-MAKING PROCESS

3.1 GENERAL

Given the information on the military logistic system presented in Section 2, simplified models of the individual and his/her decision-making process provide a basis for introducing sociologically and psychologically oriented elements into the analysis. The individual is confronted with information and with demands in the form of requirements for items and/or services, normally with a required delivery date or hour.¹ These demands come from several potentially competing sources including the military chain of command, technical (i.e., logistic) channels, social channels, on-site beneficiaries of the acquisition of military items or services, and direct observation of the environment by the individual. In each case the individual must decide whether to satisfy the demand using regular logistic procedures, whether to satisfy the demand using irregular logistic procedures, or whether to fail to satisfy the demand.

3.2 DEMANDS ON THE MILITARY LOGISTIC SYSTEM

Irregular military logistic procedures are initiated by an individual's decision to use such procedures as a means of satisfying a specific demand for items or services. The role of the demand in initiating the decision process makes it important to define more fully what is meant by "demand." A two-fold system of classification (set of typologies)

¹This delivery date and hour may be imprecise, such as "as soon as possible," or "first thing in the morning," or, for less urgent demands, "sometime this week."

is useful for this purpose. The first typology of interest, Table 3-1, indicates what items or services the demands being considered in this study are designed to obtain. This is a limited subset of the full range of demands to which the logistic system must respond. The second typology, Table 3-2, classifies demands by the operational contexts in which a demand can be made. This typology was cited briefly earlier in paragraph 1.5 as a mediating factor in the incentive structure behind irregular logistic procedures.

3.3 THE USER DECISION MODEL

The organizational structure of the military provides the environment in which the decision is made to use irregular logistic procedures once a demand has been received. Interpersonal, group and intragroup relationships are all involved, and all impact on the individual's decision-making process. Figure 3-1 provides a model of the individual user's process of initiating action to satisfy demands. The individual user is the person responsible for deciding how to satisfy a demand. In this study the user may be a mechanic, a supply clerk, or a superior in the chain of command who assumes responsibility for deciding how the demand will be satisfied. Figure 3-1 indicates five channels of communication furnishing the individual with information including demands²:

- Command Channels--the hierarchical military operations organizational structure for the helicopter units being studied.
- Technical Channels--the corresponding hierarchical military logistic organizational structure.
- On-site Beneficiaries--the individuals whose operations or environment will be affected by the demand (helicopter crew for helicopter maintenance; tent-mates for installation of a wooden tent floor). The same individual may be both the user and an on-site beneficiary, or an on-site beneficiary and a member of a peer group.

²The information provided, includes all elements of the situational and motivational contexts described as part of the incentive structure leading to use irregular logistic procedures (paragraph 1.5). Most or all of this information has been provided prior to the occurrence of a given demand, and is resident in the individual's memory.

Table 3-1

TYPOLGY OF DEMANDS

1. Demands for End Items. End items are complete assemblies such as helicopters, rifles, shoes, or major components such as radios. These are subject to irregular acquisition through misappropriation, misrepresentation, connivance, or simple failure to comply with authorized procedures. They may be borrowed from other units using other than authorized procedures. They may also be obtained from nonmilitary sources in some cases.
2. Demands for Parts and Components. These are parts of end items. In addition to the irregular procedures which apply to end items, parts and components may be obtained by cannibalization.
3. Demands for Services From a Higher Source of Supply. These may be maintenance services (of principal interest in this study) or other services such as laundry or graves registration. They can be obtained irregularly by misrepresentation, connivance, or simple failure to comply with authorized procedures.
4. Demands for Services Provided by The User. These may be as simple as tightening a bolt. This type of demand is subject to the use of "short cuts" or other procedural modifications deemed to save time and effort without jeopardizing safety or mission accomplishment.
5. Demands for Use of Equipment. The irregular logistic procedure normally associated with this type of demand, is the use of a piece of equipment when, by prescribed maintenance standards, it should be considered inoperable.

Table 3-2

CONTEXTUAL TYPOLOGY OF DEMANDS

1. DEMANDS FOR ESSENTIAL ITEMS/SERVICES

Demands for items/services necessary to mission accomplishment. These are demands which must be satisfied in order to prevent a direct impact on the ability of units or individuals to accomplish their mission effectively. These demands are mostly related to support of weapons systems or other types of operating systems. (For example, demands for parts such as helicopter transmissions which must be furnished in order to prevent a reduction in operational readiness of the helicopter unit).

2. DEMANDS FOR CONTRIBUTORY ITEMS/SERVICES

Demands for items/services potentially contributing to mission accomplishment. These are demands for items or services which may be beneficial to mission accomplishment, but are not essential to it. They usually involve some element of increasing creature comforts for the troops, but may also increase efficiency of support operations or otherwise bear more directly on the mission. Often their principal impact on helping the mission is through improving human performance by raising morale, reducing fatigue, or creating better working conditions. (For example, demands for wooden tent floors, cubicles in Quonset huts, or concrete work pads in temporary field maintenance facilities).

3. DEMANDS FOR NONCONTRIBUTORY ITEMS/SERVICES

Demands for items of no benefit to mission accomplishment. These are demands for items or services which, for the purpose intended by the demand, will not improve mission capability--and may even reduce it. (For example, demands for tools intended to be taken home for personal use, or demands for use of a repair shop to service personal vehicles.)

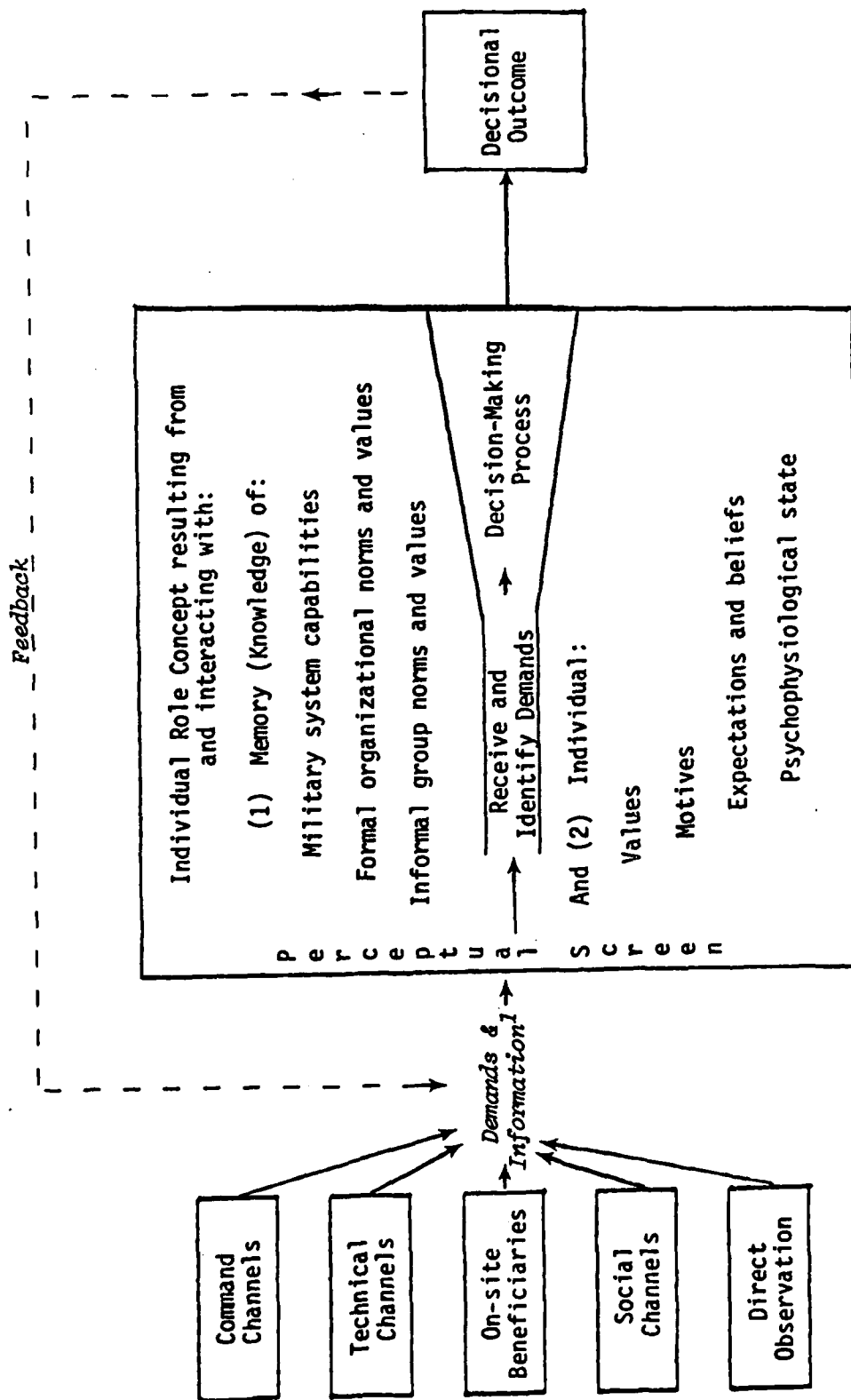


Figure 3-1. Simplified Model of Individual Initiating Action to Satisfy a Demand for Items and Services

¹ "Information" includes pertinent information on all elements of the incentive structure.

- Social Channels--the peer group (e.g., buddies, co-workers) who can make demands or provide information, including expressions of favor or disfavor, for actions.
- Direct Observation--the user can observe from his/her environment the need for an item, service, or procedure (the helicopter mechanic may observe a cracked tail rotor blade at a scheduled maintenance--or may note that he/she would like a wash basin in his/her tent).

After a demand is identified, the individual must make a series of decisions related to the possible satisfaction of the demand. The same individual factors affecting the user's selective perception also affect the decision process. Figure 3-2 is a decision "map" which expands the decision-making "Black Box" in Figure 3-1 and concerns current demands for items or services. Figure 3-2 contains six decision points concerned with the use of irregular logistic procedures to obtain items or services. Three decisions of interest triggered by different types of demands and not included in Figure 3-2 are the decisions to:

- Use irregular procedures to obtain unauthorized stocks of items to meet future demands (hoarding)
- Use irregular maintenance procedures as short cuts to save time and effort
- Operate equipment with maintenance deficiencies (when the equipment operator judges safety is not impaired to a degree incompatible with mission urgency, and the deficiencies cannot be corrected before operational requirements must be met)

These decisions are covered in paragraph 3.4. Initially, Figure 3-2 will be discussed by briefly explaining the nature of each decision point. Paragraph 3.5 will describe the relationship of the elements of the irregular logistic procedures incentive structure to these decision points, and to those described in paragraph 3.4.

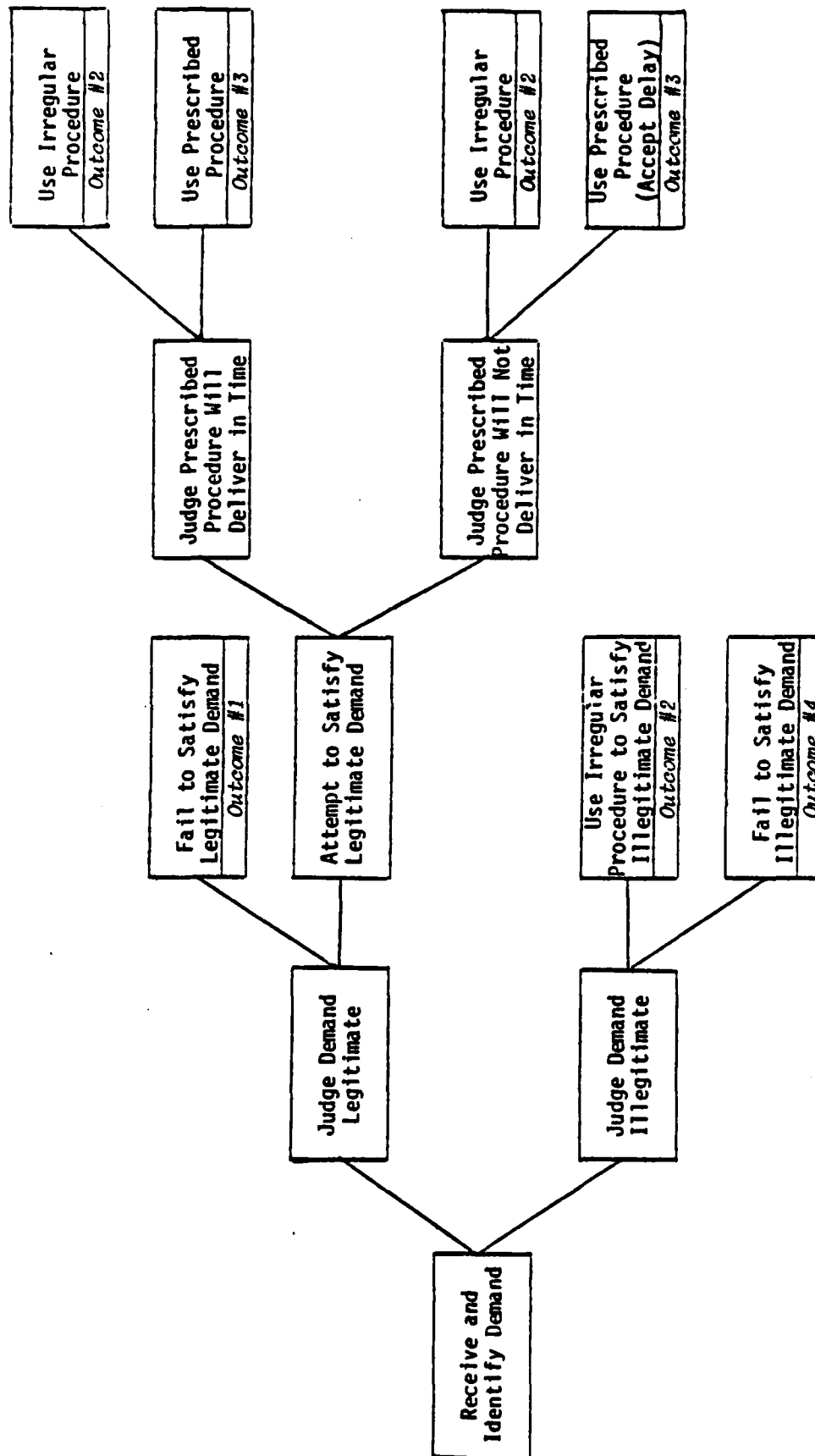


Figure 3-2. Decision Map for the Use of Irregular Logistic Procedures to Obtain Items or Services to Satisfy Current Demands

3.3.1

The Decision Points

The decision-making process begins with decision point I of Figure 3-2; the decision as to whether in terms of the criteria of the logistic system the identified demand is perceived by the user as legitimate or illegitimate.³ This classification of demands may be implicit, requiring

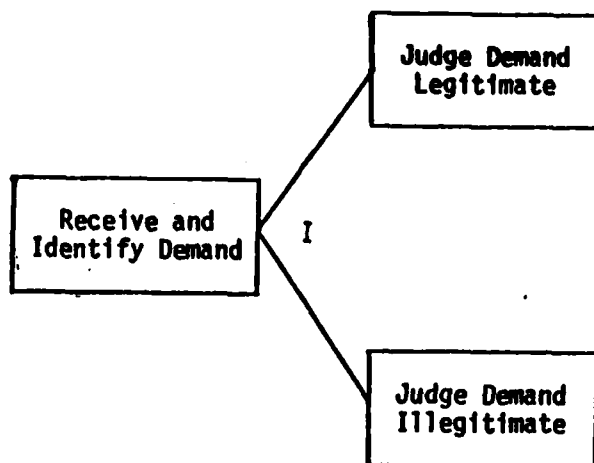


Figure 3-2a, Decision Point I

little or no conscious thought, but it is the essential first step in determining whether the demand can be addressed by following prescribed logistic procedures. At this stage of the decision process, irregular procedures can arise from a failure to distinguish between legitimate and illegitimate demands on the logistic system. A determination of legitimacy may be based on knowledge of a demand's basis in regulation--that the demand (to include both the item or service and its intended use) is authorized by regulation, SOP, or other written or verbal directive. Or, such a determination may rest upon perceptions of the legitimacy of the source or form of the demand, when, for example, an individual must decide whether a superior officer or NCO has the requisite authority to override unit SOP's or other written or verbal directives, and has done so in accordance with requisite procedures. An incorrect

³This problem is not always simple. The "system" itself may not have an agreed answer as to what is legitimate--particularly for demands for contributory items/services as defined in Table 3-2. See also paragraph 2.3.

determination by the user that a demand is legitimate will not result in an irregular logistic action unless the source of supply makes the same error. But an incorrect determination by the user that a demand is illegitimate is likely to lead to an unnecessary irregular logistic procedure.

Decision Point II is reached when an individual has identified a demand as a legitimate one--one that the military logistic system is intended to satisfy. The individual must now decide whether or not to satisfy the demand. Under certain conditions individuals may decide not to satisfy the demand for reasons having to do with

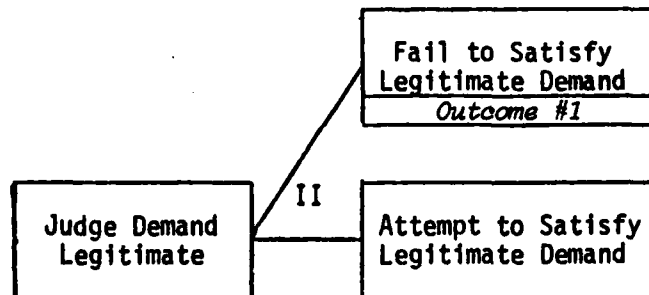


Figure 3-2b, Decision Point II

personal animosities or disgruntlement. This situation would normally exist when unit morale is poor and, for example, the individuals involved are in the Service or in a specific assignment against their will. Otherwise, if a user decides not to fulfill a legitimate demand, even before timeliness of demand satisfaction is considered, it is likely to be due to work overload and established priorities. In this situation, an individual may reject legitimate lower priority demands in order to concentrate on higher priority actions.

Decision Point III involves the judgment (based on past experience, informal advice, or formal query of the source of supply) that

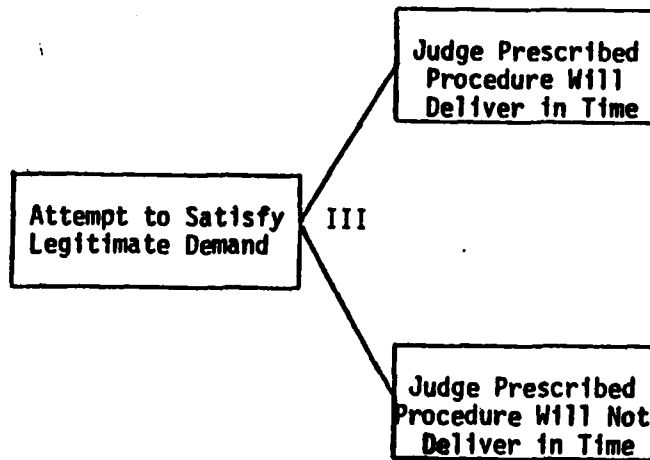


Figure 3-2c, Decision Point III

regular logistic procedures can or cannot satisfy a legitimate demand within operationally necessary (or other governing) time limits.

Decision Point IV involves a choice between using prescribed and irregular procedures.

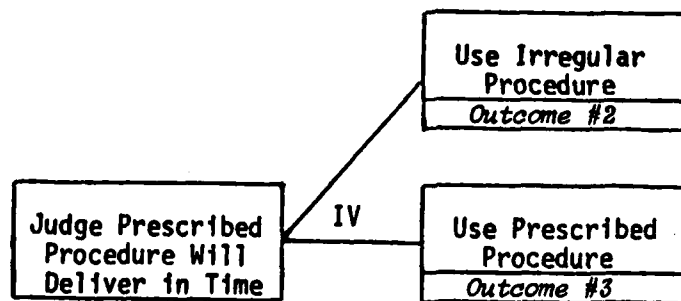


Figure 3-2d, Decision Point IV

In this decision, there is not a significant operational reason to justify use of irregular procedures. Certain behavioral incentives could bring about a decision to use irregular procedures in this case; for example, to avoid

paperwork, or to enhance one's peer group reputation as a scrounger.

Decision Point V involves the choice most clearly invoking operational necessity as the justification for use of irregular military logistic procedures. The mission will suffer if irregular procedures are not used.

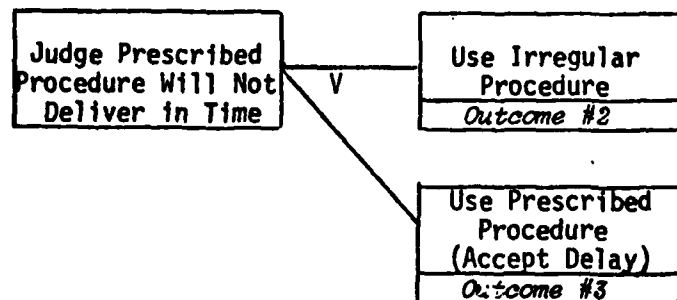


Figure 3-2e, Decision Point V

Decision Point VI involves the decision to satisfy an illegitimate demand. In this case, any decision to satisfy the demand involves irregular procedures, since the demand is one that the supply

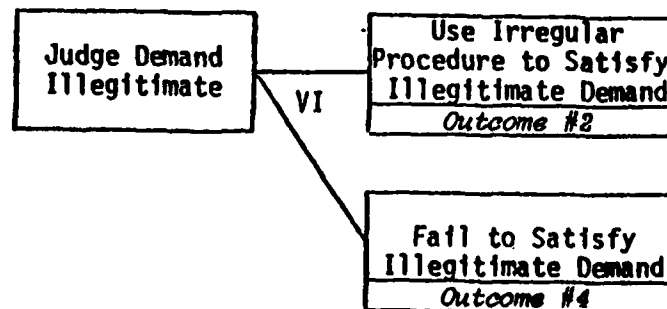


Figure 3-2f, Decision Point VI

system has specified as "not to be filled". Many such demands, rather than being self-oriented actions purely for personal gain, may be instances in which an individual is encouraged, or instructed by a superior to undertake to improve the welfare of other individuals or the unit. For example, an individual might use diesel fuel to lay the dust on a road or helicopter pad when the use of diesel fuel for this purpose was strictly forbidden. Or an individual might be a member of a group under instructions from the first sergeant to "appropriate" building material from a construction site to make desired improvements to billets--improvements which might later draw praise from senior officers. A unit commander may order an irregular procedure increasing unit readiness in order to enhance chances of promotion rather than to meet a significant operational need. Also occurring at this decision point, of course, are decisions to steal items and sell them for personal profit, or other similar actions oriented purely for personal gain.

3.4 ADDITIONAL DECISION POINTS

Three additional decision points not included in the decision process of Figure 3-2 reflect demands other than for an item or service currently desired. They are, however, included within the scope of the study. These decisions relate to hoarding, maintenance short cuts, and operation of equipment with maintenance deficiencies.

3.4.1 Hoarding

The decision to hoard involves the anticipation of a future demand for an item. This decision may occur as the result of a specific incident (e.g., failure to receive a needed item, a chance opportunity to hoard), on the basis of reflection by an individual, or as the result of a stimulus from others. In all cases it results from a judgment, made or imposed⁴, that the prescribed procedure may not deliver an item when needed at some future time. As shown in Figure 3-3, the choice, once that

⁴For example, an individual's superior may impose such a judgment on him/her.

judgment has been reached, is either to accept the likelihood of an unsatisfied demand for the item in the future, or acquire unauthorized stocks of the item.

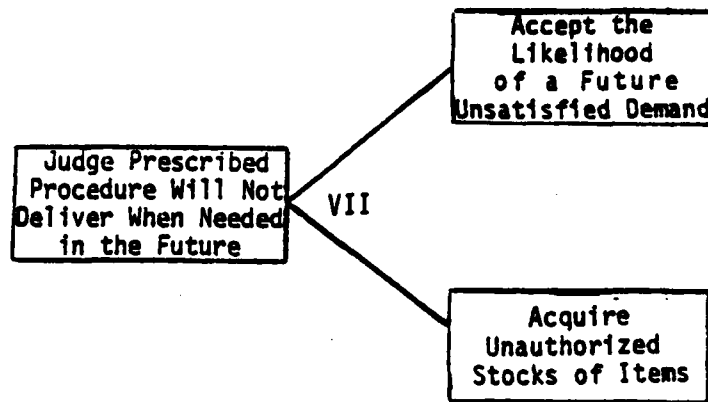


Figure 3-3. Hoarding

3.4.2 Maintenance Short Cuts

The general system for prescribing maintenance procedures was described in paragraph 2.4. The demand involved is a demand for a mechanic to perform a maintenance procedure. The decision to use an unauthorized short cut for such a procedure will occur as the result of an individual conceiving or learning of a shortcut. As indicated in Figure 3-4, the individual may decide to use the prescribed procedure in such cases. Or the individual may use initiative and employ the short cut without waiting for it to be authorized.

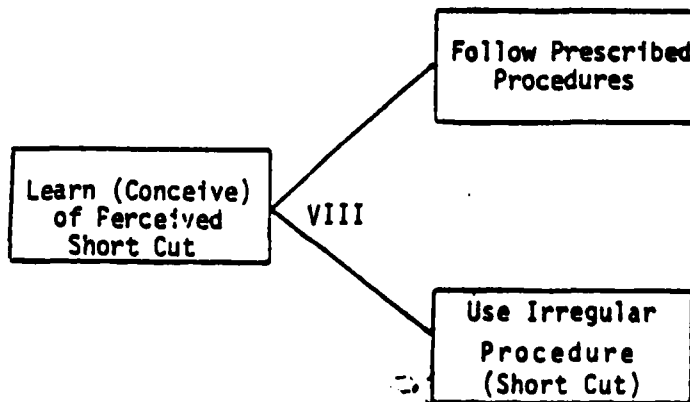


Figure 3-4. Use of Maintenance Short Cuts

3.4.3 Operation of Equipment With Maintenance Deficiencies

Table 3-1, Typology of Demands, listed "Demands for Use of Equipment", as the fifth type of demand of interest. Such demands are, of course, a part of normal operating procedures--equipment is furnished to units so that it may be used. Such demands are of concern in addressing irregular logistic procedures only when demands are made for the use of equipment which has maintenance deficiencies that, according to prescribed logistic procedures, should cause the equipment to be deadlined. Such maintenance deficiencies may be anything from a failure to perform a scheduled inspection, to a serious maintenance defect. If the deficiency cannot be corrected in time to meet an operational need for the equipment, and the need is urgent, the decision shown in Figure 3-5 must be made. Especially in time of war, this may be a significant and relatively frequent decision. The operator of the equipment (e.g., the pilot of a helicopter, the driver of a truck) or a superior in the chain of command must weigh the risks to the crew and the equipment (if the equipment is used with the maintenance deficiencies) against the risks to the unit and its mission (if the equipment is not used).

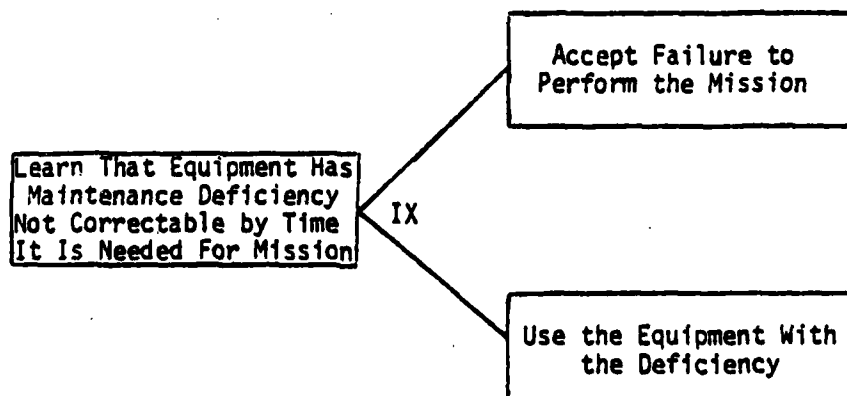


Figure 3-5. Operation of Equipment With Maintenance Deficiencies

3.5 LINKAGE OF CONTEXTUAL INCENTIVE STRUCTURE ELEMENTS TO OUTCOMES THROUGH DECISION POINTS

The contextual elements of the incentive structure leading to

the use of irregular logistic procedures as outlined in Section 1 included:

- Military Logistic Situation
- Specific Demand
- Applicable Irregular Logistic Procedures
- Unit Norms
- Incentives pertaining to Irregular Logistic Procedures
- Disincentives Pertaining to Irregular Logistic Procedures

These elements provided the contexts in which the individual decided among four outcomes:

- Use authorized procedures to satisfy demand
- Use irregular procedures to satisfy demand
- Fail to meet the demand:
 - at all
 - in time

This section (Section 3) has provided the decision model which is the basis for indicating how the contextual elements of the incentive structure interact to produce the outcomes listed above.

Among the six contextual elements, the specific demand is unique in that it is the element which, by its occurrence, triggers the whole decision process. This demand may be for an item or service, now or anticipated for the future; or, in one of the decisions treated (paragraph 3.4.3) the demand may be for conduct of operations using equipment with maintenance deficiencies. Thus the specific demand enters the model as input and is not unique to any one decision point.

The other five contextual elements of the incentive structure apply selectively to the decision points of the basic model and those for the additional three decisions of paragraph 3.4, as shown in Figure 3-6. The last six decision points may lead directly to an irregular logistic procedure. Decision points I and III may lead indirectly to irregular logistic procedures by incorrectly channeling the decision process through decision points VI and V respectively.

Elements of Incentive Structure -----> Decision Points ----->		CONTEXTUAL ELEMENTS						OUTCOMES			
		Military Logistic Situation		Type of Irregular Procedure	Unit Norms	Incentives for Irregular Log. Proc.	Disincentive for ILP	Use Prescribed Logistic Procedures	Use Irregular Logistic Procedures	Fail to Meet the Demand at All	Fail to Meet Demand in Time
		Authoriza-tion Status	Nature of Demand								
Basic Model											
I. Legitimacy of Demand		X			X						
II. Satisfy vs Fail to Satisfy (Legitimate Demand)					X	X	X	X		X	
III. Judge Whether Prescribed Procedure Will Satisfy in Time					X						
IV. Irregular vs. Prescribed Procedure on Time			X	X	X	X	X	X	X		
V. Irregular vs Prescribed Procedure Late			X	X	X	X	X		X		X
VI. Irregular vs Fail to Satisfy (Illegitimate)			X	X	X	X	X		X	X	
VII. Hoard vs Likelihood of Future Shortage			X	X	X	X	X		X		X*
VIII. Prescribed Procedure vs Maintenance Short Cut					X	X	X	X			
IX. Operate Deficient Equipment vs Abort Mission					X	X	X		X	X	
Para 3.4											

* In the future.

Figure 3-6. Linkage of Contextual Incentive Structure Elements to Outcome Through Decision Points.

SECTION 4

USE OF IRREGULAR PROCEDURES AS A GENERAL SYSTEMIC PHENOMENON

SECTION 4

4.1 USE OF IRREGULAR PROCEDURES AS A GENERAL SYSTEMIC PHENOMENON

The discussion to this point has been of irregular military logistic procedures. The incentive structure of Figure 1-1 and the models of Sections 2 and 3, however, do not require much modification to apply to many other systems. These systems involve relatively large organizations with procedures centrally prescribed. Resources are furnished primarily from centralized sources to satisfy demands. These resources are used to achieve operational objectives (frequently urgent in nature) which involve overcoming local obstacles which are not subject to detailed prediction. Some possible examples include:

- Military recruiting systems. Attempts by military recruiters to meet quotas in the face of centrally determined qualification standards produce periodic complaints as some recruiters either promise what they cannot deliver or seriously circumvent qualification requirements. But short of such undesirable recruiting irregularities, there are a number of exercises in ingenuity which a recruiter can use to maintain his recruitment quota. He can help a potential recruit correct his deficiencies or obtain waivers for them, or help find acceptable alternatives to the recruit's preference of enlistment options.
- The socialist economies of the Soviet Union and other Communist countries. These economies have been unable to operate at the local level except through the services of unauthorized, normally illegal "expeditors." Tolkach¹ is as characteristic of the Soviet economy as is central planning. It involves both essential expediting and cutting of red tape and misuse for personal profit.

¹The Soviet name for the irregular procedures essential to the operations of their economy.

- The social services of the United States (including such programs as Medicare and food stamps). These services can often achieve their objectives only through irregular actions. Problems such as local eligibility interpretations, allowable costs, and conflicting jurisdictions and regulations exist in such profusion and variety that the welfare system can bog down when no one takes irregular actions to cut through red tape. Concurrently, these same conditions provide opportunities for illegally or improperly profiting from the welfare system. These opportunities invite a rash of "nonmission-relevant" irregular activities which can produce large-scale waste and misapplication of funds.
- Large-scale centralized industrial and commercial enterprises in Western economies. Examples range from banking to manufacturing industries to hotel and fast-food chains.

In all these systems there is a common thread with military logistic systems: for the system to operate effectively at the local level, there must be a certain degree of irregular logistics as a red-tape-cutting, self-compensating element of the system; but this need for irregular procedures to make the system effective facilitates the use of irregular procedures by individuals or groups who wish to take advantage of the system for their own benefit. The challenge for all such systems is to differentiate the constructive irregular procedures from the detrimental ones; to make provision for the constructive procedures and make them more effective; and to minimize the detrimental procedures.

SECTION 5

HYPOTHESES

SECTION 5

HYPOTHESES

5.1 INTRODUCTION

This section contains two types of hypotheses. Specific hypotheses are those applicable in the analysis of supply and maintenance in helicopter units, and may be applicable to other military units. General hypotheses are applicable only to the general subject of irregular logistic procedures, being too broad in applicability for significant testing within the scope of this study. Some specific hypotheses may be very broadly stated, while some of the general hypotheses may be more narrowly stated. The basis for differentiation is applicability--specific hypotheses can be meaningfully tested in the context of helicopter unit supply and maintenance; general hypotheses cannot. For example, the hypothesis that, "Of the irregular logistic procedures considered in this study¹, some are considered helpful and some harmful to unit effectiveness", although rather broadly stated, is a specific hypothesis because it can be meaningfully tested within the context of helicopter units in this study. The hypothesis that, "Each type of logistic operation² will have its own characteristic set of irregular procedures, some of which are shared with other types of logistic operations" is more narrow and specific in focus, but is a general hypothesis because it cannot be subject to meaningful testing within the scope of this study.

¹As listed in Table 1-1.

²As listed in Table 1-2.

The hypotheses presented in this section are based on the definition of the problem; on discussions with military consultants and other military personnel; and on the reconnaissance research conducted as a part of this study. The reconnaissance research consisted of several controlled group discussions with active duty and retired personnel selected as representative of the types of personnel to be surveyed in the next (survey) phase of the study.

5.2 SPECIFIC HYPOTHESES

The specific hypotheses postulated as applying within the scope of this study are listed below.

5.2.1 Hypotheses with Respect to the Different Types of Irregular Procedures which may be Used³.

It is hypothesized that:

- A. Of the irregular logistic procedures considered in this study, some will be considered helpful to unit effectiveness.
- B. Among the groupings of individuals surveyed, (e.g., differentiated by rank, type of job, or degree of job satisfaction) there will be different patterns of irregular procedures considered helpful and irregular procedures considered harmful to unit effectiveness.
- C. More types of irregular procedures will be considered helpful under combat conditions than under garrison conditions.
- D. Fewer types of irregular logistic procedures will be considered harmful under combat conditions than under garrison conditions.
- E. There will be a consensus that if they never used irregular logistic procedures, personnel in combat would be able to perform their duties less than adequately.
- F. There will be a consensus that if they never used irregular logistic procedures, personnel in garrison would be able to perform their duties less than adequately.

³As listed in Table 1-1

In the process of testing the above hypotheses, it is expected that specific information will be developed as to which irregular procedures are of particular concern in helicopter operating units and in the support of these units by intermediate maintenance activities, and why these procedures are of concern.

5.2.2

Hypotheses with Respect to the Individual's

Ability to Determine the Legitimacy of a Demand.

It is hypothesized that:

- A. Among the groupings of individuals surveyed, different groups will reflect differing degrees of difficulty in determining what items are authorized by the logistic system.
- B. Most individuals surveyed will seldom have difficulty in determining the legitimacy of demands for items necessary to mission accomplishment.
- C. Most individuals surveyed will seldom or never have difficulty in determining the legitimacy of demands for items of no benefit to mission accomplishment.
- D. Most individuals will more often have difficulty in determining the legitimacy of demands for items potentially contributing to mission accomplishment in combat than for other types of demands⁴.

5.2.3

Hypotheses Concerning the Capability and Willingness of the Military Logistic System to Fill Demands for Items.

It is hypothesized that:

- A. Most individuals surveyed will at some time have been refused issue of or authorization to requisition items which they felt to be necessary or potentially contributing to mission accomplishment, both in garrison and combat.
- B. Most individuals surveyed feel that the logistic system has been unable to furnish authorized items when needed at least 25% of the time for items necessary or contri-

⁴Types of demands as listed earlier in Table 3-2.

buting to mission accomplishment, both in garrison and in combat.

- C. Most individuals surveyed feel that in combat they are justified in using irregular procedures often or always when the logistic system is unable to deliver a needed and authorized item by the time it is needed.
- D. Most individuals surveyed feel that in garrison they are justified in using irregular procedures at least sometimes when the logistic system is unable to deliver an unauthorized item by the time it is needed.

In the testing process for the above hypotheses, it is expected that useful information will be obtained on perceived characteristics of the logistic system.

5.2.4

Hypotheses Concerning the Role of the Chain of Command in the Use of Irregular Procedures.

It is hypothesized that:

- A. When mechanics use irregular logistic procedures, it will often be in response to instructions from military superiors.
- B. When mechanics use irregular logistic procedures, it will seldom be on their own initiative, or in response to requests from others outside the chain of command.
- C. When individuals use irregular logistic procedures without being told to do so by their superiors, in both combat and garrison they will perceive that that their superiors will almost always know that they have done so.
- D. For items necessary or contributing to mission accomplishment, when individuals use irregular logistic procedures in combat without being told to do so by their superiors and their superiors are aware of it, the superiors will normally condone the act and will in many cases praise them for it.
- E. For items necessary or contributing to mission accomplishment, when individuals use irregular logistic procedures in garrison without being told to do so by their superiors and their superiors are

aware of it, the superiors will either ignore or condone the act.

- F. When an individual uses an irregular logistic procedure in response to instructions from military superiors, groupings by rank of the individuals surveyed will differ in terms of where they think responsibility is placed in practice.
- G. Most individuals surveyed (for all ranks) will feel that when an individual uses irregular logistic procedures in response to instructions from military superiors, the responsibility should reside with the military superior.

It is expected that in the process of testing the above hypotheses detailed information will be developed in terms of specific perceptions and attitudes of different groups within the population being surveyed.

5.2.5

Hypotheses Concerning Work Group Norms

It is hypothesized that:

- A. Perceived work group norms will fall into patterns which differ among types of units and Services.
- B. Perceptions of work group norms related to irregular logistic procedures will fall into patterns which differ by military rank of individuals surveyed.
- C. Perceptions of work group norms related to irregular logistic procedures will fall into patterns which differ according to the degree of job satisfaction of those individuals being surveyed.
- D. Work groups that display norms which reflect a highly responsible attitude towards duty and teamwork will tend to encourage the use of irregular logistic procedures.
- E. Perceived work group norms favoring the use of irregular logistic procedures will be stronger in combat than in garrison.

- F. Work groups which encourage the use of irregular logistic procedures will reflect a highly responsible attitude towards duty and teamwork.

The testing of these hypotheses will provide sufficient information to permit an assessment in considerable detail of variations in relevant perception of unit norms.

5.2.6 Hypotheses Concerning Individual Incentives and Disincentives

It is hypothesized that:

- A. Different patterns of incentives and disincentives perceived as influential by individuals will be associated with different states of authorization for items or services (i.e., not authorized, authorized and available in time, or authorized but not available in time).
- B. Among the groupings of individuals surveyed (grouped by rank, type of job, or degree of job satisfaction) there will be different patterns of incentives and disincentives.
- C. The developed patterns of incentives and disincentives will link those encouraging the use of irregular logistic procedures with those reflecting responsible attitudes toward military duties (including mission accomplishment).

The testing of these hypotheses will be done in such a manner as to provide information with respect to more than 24 potential incentives and disincentives.

5.2.7 Hypothesis Concerning Maintenance Short Cuts

It is hypothesized that:

- A. Individuals surveyed will feel that unauthorized short cuts can be used less often in garrison than in combat to make helicopter maintenance faster or easier without reducing the quality of the results.

Additional information pertinent to maintenance short cuts will be developed in the course of testing the hypotheses concerning incentives and disincentives.

5.2.8 Hypothesis Concerning Hoarding

- A. A pattern of attitudes will be identified

that indicates a net influence for most individuals which is conducive to hoarding parts to prepare for future requirements.

5.2.9

Hypotheses Concerning Decision Outcomes

It is hypothesized that the patterns of incentives, disincentives, and work groups norms will reflect a net influence in favor of:

- A. Attempting to satisfy a legitimate demand (decision point II).
- B. Using prescribed procedures when it is believed that they will satisfy the demand for an authorized item or service in time (decision point IV).
- C. Using an irregular procedure when it is believed that the prescribed procedures cannot satisfy the demand for an authorized item or service in time (decision point V).
- D. Failing to satisfy an illegitimate demand unless it is for an item considered essential or contributory to mission accomplishment (decision point VI).
- E. Using irregular procedures to prepare for future needs for authorized items (decision point VII).
- F. Taking maintenance short cuts when they are perceived as saving time and effort without reducing the quality of the results. (decision point VIII).
- G. Accepting the use of equipment with maintenance deficiencies in combat when it is essential to the mission (decision point IX).

5.3

GENERAL HYPOTHESES

The following are general hypotheses not subject to testing with the data obtained in this study. It is hypothesized that:

- A. The specific hypotheses as tested for helicopter units and their backup maintenance support units apply generally for supply and maintenance to other operational military units and their backup logistic support units.
- B. Each type of logistic operation⁵ will have its own

⁵As listed in Table 1-2.

characteristic set of irregular procedures, some of which are shared with other types of logistic operations.

- C. The military logistic system cannot for any type of logistic operation meet all essential demands in time without use of irregular logistic procedures.
- D. Environmental conditions⁶ may in some circumstances impact strongly on the use of irregular logistic procedures, especially with respect to demands related to human welfare.
- E. As a general rule, decreases in complexity of equipment will decrease the necessity for the use of irregular logistic procedures.
- F. As a general rule, decreased requirements for maintenance in equipment will decrease the requirement for the use of irregular logistic procedures.
- G. As a general rule, decreased density of equipment will increase the requirements for use of irregular logistic procedures.
- H. Human welfare/creature comfort related uses of irregular logistic procedures are fostered by the high U.S. expectations concerning appropriate standards of living for troops in the field.
- I. Most irregular logistic actions are based on constructive attitudes reflecting a desire to contribute to mission accomplishment (including provision for troops welfare).
- J. Use of irregular procedures is essential to effective operation of all complex, centralized hierarchical organizations⁷.
- K. The study of individual operating systems (such as a specific tank, artillery, or aircraft system)⁸ can indicate principle sources of irregular logistic procedures used with that system (or that are likely to

⁶As listed in Table 1-2.

⁷As described in paragraph 1.3.1.

⁸As discussed in paragraph 1.3.4

be used with that system in the case of developmental systems); and further, that such study can produce improvements in the system or in prescribed procedures associated with the system that will increase operational readiness and reduce negative impacts from the use of irregular logistic procedures.

5.4 HYPOTHESES VALIDATION

The survey which will be conducted as the next phase of this study will consist of six types of questions designed to provide empirical data to test the hypotheses in Section 5. Demographic questions and job satisfaction questions divide the military population into components. These components will be analyzed to see if they have separate incentive structures. The other four types of questions concern:

- The Military Logistic Environment. These questions will concern primarily the relationship of the military environment to irregular procedures, secondarily some incentives and disincentives associated with the military chain of command.
- Social Psychology. These questions concentrate on sociological and psychological incentives and disincentives associated with the use of irregular logistic procedures under different authorization status (authorized and available in time, authorized but not available in time, not authorized).
- Types of Irregular Logistic Procedures. These questions are concerned with the utility of (or harm caused by) various types of irregular logistic procedures under combat and garrison conditions as perceived by the system users.
- Unit Norms. These questions are concerned with unit norms both in terms of peer groups and the military chain of command.

Thus, once the survey is completed, data will be available permitting analysis of the incentive structure. This analysis will link the contextual elements of the incentive structure to decision outcomes through the different decision points of the model of the individual's decision process. This analysis will provide the basis for findings and conclusions oriented towards practical logistic problems.

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This Interim Report defines the basic concept of the incentive structure for the use of irregular (unauthorized) logistic procedures in the military. It analyzes the irregular logistic procedure phenomenon from military, behavioral science, and systemic viewpoints. The report concentrates on pertinent aspects of the military logistic system and individual decision-making, moving from generalized models to the model of the individual mechanic as a decision-maker in a military helicopter unit. The report proposes that some irregular procedures are necessary for the effective functioning of		

19. Key Words (continued)

Scrounging
Supply
Worker Motivation

20. Abstract (continued)

the military logistic system (and of similar large, complex hierarchial systems). It concludes with a set of hypotheses to be tested through survey research.

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APPENDIX C

STATISTICAL INFORMATION

APPENDIX C

STATISTICAL INFORMATION

1.0

GENERAL

This appendix provides four types of statistical information:

- Section 2.0 provides a copy of the questionnaire administered during the survey phase of the study, with the percentage results (marginals) inserted. Data for questions 14 and 22 were not compiled due to an economy of effort decision. Also included are the variable coding designations used in the statistical presentations of Sections 2 and 3.
- Section 3.0 consists of the sorted rotated factor loadings derived in the factor analysis of various groups of variables. These groups include the logistic situational variables; the types of irregular logistic procedures; the group norms; and the individual incentives. The variable designations used in these factor matrices are keyed to the questions in the questionnaire, Section 2.
- Section 4.0 consists of charts summarizing the incidence of statistically significant differences among the different groups comprising the sample. These groups were by: rank, career field, work group, combat experience vs. no combat experience (referred to as "garrison"), job satisfaction, and service. These summary charts also use variable designations keyed to the questions in the questionnaire.
- Section 5.0 provides a selected set of "free form" comments with the questionnaire. This selected set is generally representative and is included to give some "flavor" with respect to observations by the individuals included in the survey.

1.1

RELEVANCE

This appendix is intended to provide the reader the opportunity to pursue some element of the study in more depth; and it provides the individual who likes to get a feeling for the nature of the raw data an opportunity to do so.

2.0

QUESTIONNAIRE RAW DATA

The questionnaire used in the field survey follows this page. Three changes have been made to this questionnaire to facilitate its use by the reader:

- In place of answers to be circled in question matrices, marginals (i.e., the percent of the respondents who chose that answer) have been inserted
- In the left margin, variable coding designations have been provided for certain questions. These are for reference with Sections 3.0 and 4.0 of this appendix
- The last three question sets have been omitted. It was obvious from the response that they were inappropriately worded and yielded meaningless results. Other related questions sufficed to provide the necessary information

1. Indicate your current grade:

LEGEND: Values in %

20	11	20	10	11	5	1	1	0	3	1	1	1	8	0	1	1
E1-3	E4	E5	E6	E7	E8	E9	WO1	WO2	WO3	WO4	O1	O2	O3	O4	O5	Civ

2. Please indicate the number of years you have served in each of the military assignments listed below. Fill in all six blanks. Put "0" in the blanks by each assignment in which you have not had any experience.

LEGEND: #indiv @av yrs. experience

Helicopter unit commander	21 @ 1.9 Years
Maintenance officer/warrant officer at the helicopter unit or direct support unit level	39 @ 3.9 Years
Supply officer/warrant officer at the helicopter unit or direct support unit level	31 @ 2.2 Years
Maintenance NCO at the helicopter unit or direct support unit level	68 @ 5.5 Years
Supply NCO at the helicopter unit or direct support unit level	56 @ 3.6 Years
Helicopter mechanic	121 @ 3.7 Years

NOTE: Some individuals have experience in more than one category.

3. Have you had any experience in military supply not covered above?

☐ Yes ☐ No Omitted

4. How much active military service do you have? .33@1-4; .33@5-11; .33@12-27

av = 9.3
Years

5. For how many personnel are you the immediate supervisor? (Include only those who report directly to you whose performance reports you write.) .33@0; .33@1-5; .33@6-208

av = 8.7
Number

FOR THE FOLLOWING QUESTIONS, ANSWER BY CIRCLING THE NUMBER OF THE APPROPRIATE RESPONSE. IF YOU DO NOT FIND THE EXACT ANSWER THAT FITS YOUR CASE, USE THE ONE THAT IS CLOSEST TO IT.

6. How much schooling have you had?

- .4 Completed grade school or less
- 2 Some high school
- 34 Completed high school
- 45 Some college
- 8 Completed college
- 5 Some graduate school
- 5 Completed graduate school

7. What are your military service plans for the foreseeable future?

- 34 Make the service a career
- 22 Continue on active duty but undecided about making the Service a career
- 10 Continue on active duty but do not intend to make the Service a career
- 16 Return to civilian life
- 18 Retire

QUESTIONS 8 THROUGH 16 DEAL WITH YOUR MOST RECENT DUTY ASSIGNMENT INVOLVING HELICOPTERS.

8. From the categories listed below, indicate the most recent duty assignment involving helicopters in which you served at least one year.

- 17 17(7) Helicopter unit commander
 24(10) Helicopter unit maintenance officer or warrant officer
 11(4) Direct support (or intermediate maintenance) unit maintenance officer or warrant officer
 5(2) Helicopter unit supply officer or warrant officer
 5(2) Direct support (or intermediate maintenance) unit supply officer or warrant officer
 39(16) Maintenance supervisor (NCO) in helicopter unit (includes crew chief)
 38(15) Maintenance supervisor (NCO) in direct support (or intermediate maintenance) unit
 22(9) Supply NCO in helicopter unit
 20(8) Supply NCO in direct support (or intermediate maintenance) unit
 70(23) Helicopter mechanic

9. Is the unit in which you held the duty assignment indicated above your current unit?

- 75 75 Yes
 25 No

10. While you had this duty assignment, how often did you also fly as a helicopter pilot, co-pilot, or crew member?

- 24 24 Regularly
 21 Seldom
 55 Never

11. At what location did you have this assignment?

- 35 35 COMUS (including Hawaii)
 2 Alaska/Canada
 2 Other Western Hemisphere
 2 Western Pacific
 5 Northeast Asia (including Korea)
 0 Southeast Asia (including Thailand)
 3 Western Europe
 0 Middle East (including Turkey), South Asia, or Africa

12. Which of the following best describes the size of the base where you served during the assignment indicated in the preceding question?

- 27 27 1-25 aircraft
 34 34 26-50 aircraft
 3 3 51-75 aircraft
 36 36 76 or more aircraft

13. Which of the following best describes the conditions under which you most frequently worked during the assignment indicated in the preceding question?

- 5 Very temporary (Dirt hardstands - vans - tents)
 3 Temporary (PSP/MatSet hardstands - corrugated sheds - vans - sandbag revetments)
 22 Semi-Permanent (Concrete hardstands - limited hanger facilities - improved revetments)
 70 Permanent (Established base with extensive permanent facilities and services)

14. How did you acquire your training for this job? CIRCLE AS MANY ANSWERS AS APPLY.

- Not Used On-station unit training
 Military Service School or Training Center
 On-the-job training
 Civilian acquired skill
 Other (specify): _____

15. What was the highest rank you held in this assignment?

#	%	Rank	#	%	Rank	#	%	Rank
51(20)		E1, E2 or E3	27(11)		E7	7(3)		W02
31(12)		E4	9(4)		E8	8(3)		W03
45(18)		E5	3(1)		E9	2(1)		W04
24(10)		E6	3(1)		W01	2(1)		0-1
								2(1) 0-5

16. Indicate in what years you had this assignment: 90% 1975 or after through 1978 or 1979

QUESTIONS #17 THROUGH #24 DEAL WITH YOUR MOST REPRESENTATIVE COMBAT EXPERIENCE.

17. ANSWER THIS QUESTION ONLY IF YOU HAVE HAD COMBAT EXPERIENCE. IF YOU HAVE NOT HAD COMBAT EXPERIENCE, GO ON TO QUESTION #25.

From the categories listed below, indicate the duty assignment involving helicopters which best reflects your combat experience.

- 11 Helicopter unit commander
 13 Helicopter unit maintenance officer or warrant officer
 8 Direct support (or intermediate maintenance) unit maintenance officer or warrant officer
 2 Helicopter unit supply officer or warrant officer
 0 Direct support (or intermediate maintenance) unit supply officer or warrant officer
 25 Maintenance supervisor (NCO) in helicopter unit (includes crew chief)
 17 Maintenance supervisor (NCO) in direct support (or intermediate maintenance) unit
 2 Supply NCO in helicopter unit
 8 Supply NCO in direct support (or intermediate maintenance) unit
 13 Helicopter mechanic

18. While you had that duty assignment under combat conditions, how often did you also fly as a helicopter pilot, co-pilot, or crew member?

- 61 Regularly
 9 Seldom
 27 Never

19. In what areas did you have that assignment under combat conditions? (Indicate most recent)

2 Northeast Asia (including Korea)
 98 Southeast Asia (including Viet Nam/Thailand)
 0 Caribbean
 0 Other (specify): _____

20. Which of the following best describes the size of the base you were assigned to during the assignment indicated in the preceding question?

26 1-25 aircraft
 26 26-50 aircraft
 10 51-75 aircraft
 36 76 or more aircraft

21. Which of the following best describes the conditions under which you most frequently worked during the assignment indicated in the preceding question?

17 Very temporary (Dirt hardstands - vans - tents)
 42 Temporary (CPSP/MatSet hardstands - corrugated sheds - vans - sandbag revetments)
 29 Semi-Permanent (Concrete hardstands - limited hanger facilities - improved revetments)
 11 Permanent (Established base with extensive permanent facilities and services)

22. How did you acquire your training for that job?

On-station unit training
 Not Used Military Service School or Training Center
 On-the-job training
 Civilian acquired skill
 Other (specify): _____

23. What was the highest rank you held in that assignment under combat conditions?

<u>2</u>	E1, E2 or E3	<u>2</u>	E8	<u>0</u>	W04
11	E4	0	E9	1	O-1
19	E5	3	W01	2	O-2
27	E6	10	W02	17	O-3
3	E7	0	W03	0	O-4

24. Indicate in what years you had that assignment: 90% 1966 through 1972

25. All in all, how satisfied are you with the persons in your work group?

6 Very dissatisfied
 17 Somewhat dissatisfied
 10 Neither satisfied nor dissatisfied
 41 Fairly satisfied
 27 Very satisfied

26. All in all, how satisfied are you with your supervisor?

<u>6</u>	Very dissatisfied
12	Somewhat dissatisfied
10	Neither satisfied nor dissatisfied
33	Fairly satisfied
41	Very satisfied

27. All in all, how satisfied are you with your job?

<u>6</u>	Very dissatisfied
13	Somewhat dissatisfied
11	Neither satisfied nor dissatisfied
37	Fairly satisfied
33	Very satisfied

23. All in all, how satisfied are you with the military service, compared to other organizations?

<u>12</u>	Very dissatisfied
22	Somewhat dissatisfied
11	Neither satisfied nor dissatisfied
39	Fairly satisfied
17	Very satisfied

29. Considering your skills and the effort you put into the work, how satisfied are you with your pay?

<u>26</u>	Very dissatisfied
32	Somewhat dissatisfied
10	Neither satisfied nor dissatisfied
29	Fairly satisfied
4	Very satisfied

30. How satisfied do you feel with the progress you have made in the service up to now?

<u>8</u>	Very dissatisfied
11	Somewhat dissatisfied
11	Neither satisfied nor dissatisfied
42	Fairly satisfied
29	Very satisfied

31. How satisfied do you feel with your chance for getting ahead in the service in the future?

<u>13</u>	Very dissatisfied
21	Somewhat dissatisfied
16	Neither satisfied nor dissatisfied
33	Fairly satisfied
17	Very satisfied

In many of the following questions you are asked to provide two answers: one for garrison conditions and one for combat conditions. "Garrison" conditions refer to peacetime conditions in which you performed the duty assignment you indicated in Question #8. "Combat" conditions asks you to provide an answer which is based either on your combat experience, as indicated in Question #17, or on what you anticipate combat conditions to be like. PLEASE TRY TO ANSWER THE QUESTIONS FOR BOTH GARRISON AND COMBAT CONDITIONS WHERE THIS IS REQUESTED.

		Under Garrison Conditions					Under Combat Conditions				
		Very harmful	Harmful	Neither helpful nor harmful	Helpful	Very helpful	Very harmful	Harmful	Neither helpful nor harmful	Helpful	Very helpful
PTIG/PTIC	a. Taking items without authority.	42	34	11	10	4	35	20	2	20	3
PUCG/PUCC	b. Unauthorized cannibalization.	47	33	8	11	3	41	14	11	21	14
PIDG/PIDC	c. Intentionally submitting incorrect documents to obtain items/services.	34	34	18	12	2	30	22	10	25	13
PUSG/PUJC	d. Unauthorized stockpiling of items.	11	28	21	12	5	8	14	10	32	37
PUBG/PUCC	e. Use of bribery to obtain items/services.	24	38	21	12	5	27	18	17	22	17
PUFG/PUFC	f. Unauthorized fabrication of parts.	27	30	15	18	10	20	19	17	25	30
PUEG/PUEC	g. Unauthorized exchanges or use of items or services.	19	28	24	22	7	16	18	19	29	18
PTG/PTC	h. Theft of military items.	69	18	8	3	1	64	17	8	6	5
PUMG/PUIC	i. Use of unauthorized maintenance procedures including unauthorized levels of maintenance.	28	33	18	16	4	21	20	12	29	18
PUUG/PUUC	j. Unauthorized use of equipment with maintenance or other deficiencies.	35	43	12	8	2	27	31	18	16	8
POIG/POIC	k. Obtaining items or services from unauthorized sources.	16	30	23	25	7	10	17	17	30	25
PUPG/PUJC	l. Use of personnel for unauthorized purposes.	26	35	21	16	2	20	23	21	21	14
PUAG/PUAC	m. Use of authorized items or services for unauthorized purposes.	28	39	23	9	2	25	29	19	17	10
PUGG/PUIC	n. Use of gifts or favors, such as liquor rations, to facilitate one of the above.	39	24	23	11	4	28	17	13	23	19
PFDG/PFDC	o. Falsification of official documents to obtain items or services.	52	30	11	5	2	37	25	12	18	9

		Under Garrison Conditions				Under Combat Conditions			
		Not at all	Poorly	Adequately	Very well	Not at all	Poorly	Adequately	Very well
33.	If individuals in your current position never used any irregular logistic procedures, how well could they do the job? CIRCLE THE APPROPRIATE NUMBERS FOR BOTH GARRISON AND COMBAT CONDITIONS.								
LUPG/PNPC	a. In obtaining necessary parts and supplies for weapons and operating systems.	6	50	37	7	23	48	22	7
LPNG/LPMC	b. In performing maintenance procedures on weapons and operating systems.	8	37	47	9	15	44	33	8
LPWG/LPWC	c. In providing for individual and unit welfare (including their own welfare).	9	37	44	10	18	40	33	9

		Under Garrison Conditions					Under Combat Conditions				
		Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
34.	When an individual in your position uses irregular logistic procedures, how often will it be:										
LILG/LILC	a. in response to instructions from military superiors?	7	28	32	27	6	6	13	29	36	13
LRRG/LRRC	b. in response to requests from others outside the chain of command?	22	30	32	12	4	16	23	37	19	5
LRIG/LRIC	c. on their own initiative?	14	22	38	22	5	7	12	36	35	10

In the questions which follow (#35 - #41), you will be asked your opinions concerning three types of demands for items or services:

- Demands for items/services necessary to mission accomplishment. These are demands which must be satisfied in order to prevent a direct impact on the ability of units or individuals to accomplish their mission effectively. These demands are mostly related to support of weapons systems or other types of operating system (for example, demands for parts such as helicopter transmissions).
- Demands for items/services potentially contributing to mission accomplishment. These are demands for items or services which may be beneficial to mission accomplishment, but are not essential to it. They usually involve some element of increasing creature comfort for the troops, but may also increase efficiency of support operations. Often their principal impact on helping the mission is through improving human performance by raising morale or creating better working conditions. (For example, demands for wooden tent floors, cubicles in Quonset huts, or concrete work pads in temporary field maintenance facilities).
- Demands for items of no benefit to mission accomplishment. These are demands for items or services which, for the purpose intended by the demand, will not improve mission capability — and may even reduce it. (For example, demands for tools intended to be taken home for personal use, or demands for use of a repair shop to service personal vehicles).

While you may be able to think of items or services which seem to fall between these categories, in the following questions answer in terms of the differences emphasized in the descriptions above.

VARIABLE CODING DESIGNATIONS

CIRCLE THE APPROPRIATE NUMBERS FOR BOTH GARRISON AND COMBAT CONDITIONS.

		Under Garrison Conditions					Under Combat Conditions				
		Never	Less than $\frac{1}{2}$ the time	$\frac{1}{2}$ to $\frac{1}{2}$ the time	More than $\frac{1}{2}$ the time	All of the time	Never	Less than $\frac{1}{2}$ the time	$\frac{1}{2}$ to $\frac{1}{2}$ the time	More than $\frac{1}{2}$ the time	All of the time
35.	How frequently has the logistic system been <u>unable</u> to furnish <u>authorized</u> items when <u>needed</u> for:										
LANG/LANC	a. items/services necessary to mission accomplishment?	3	29	37	27	4	4	35	27	27	7
LAPG/LAPC	b. items/services potentially contributing to mission accomplishment?	4	31	33	29	3	4	34	31	26	4
LABG/LABC	c. items of no benefit to mission accomplishment?	15	31	20	27	8	15	33	18	26	9
		Under Garrison Conditions					Under Combat Conditions				
		Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
36.	Suppose that an item or service is <u>authorized</u> by the logistic system but <u>not available in time</u> . How often would you consider your use of irregular logistic procedures to be justified when the item or service is an:										
LNNG/LNNC	a. item/service necessary to mission accomplishment?	5	10	24	41	18	3	8	15	26	47
LNPOG/LNPOC	b. item/service potentially contributing to mission accomplishment?	7	15	45	27	6	2	11	32	34	21
LNBG/LNBC	c. item of no benefit to mission accomplishment?	40	35	16	5	4	35	29	25	7	4
		Under Garrison Conditions					Under Combat Conditions				
		Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
37.	When individuals in your position use irregular logistic procedures <u>without being told to do so</u> by their military superiors, how often do their superiors find out that such procedures have been used when the procedures are used to obtain:										
LWNG/LWNC	a. items/services necessary to mission accomplishment?	7	26	31	25	11	8	26	28	28	10
LWPG/LWPC	b. items/services potentially contributing to mission accomplishment?	9	25	39	20	7	7	28	37	22	7
LWBG/LWBC	c. items of no benefit to mission accomplishment?	29	32	21	11	7	25	34	25	11	5

MINIMUM 60 IN DESIGNATION

Circle the appropriate numbers for
BOTH GARRISON AND COMBAT CONDITIONS

	Under Garrison Conditions					Under Combat Conditions				
	Punish them	Reprimand them	Ignore the act	Condone the act	Praise them	Punish them	Reprimand them	Ignore the act	Condone the act	Praise them
39. When individuals in your position use irregular logistic procedures <u>without being told to do so</u> by their military superiors and their <u>superiors find out</u> , what would you expect their superiors to do in most cases when the procedures are used to obtain an:										
LFNG/LFNC a. item/service necessary to mission accomplishment?	6	23	31	28	14	4	7	29	27	33
LFPG/LFPC b. item/service potentially contributing to mission accomplishment?	5	29	36	23	8	3	12	38	32	16
LFBG/LFBC c. item of no benefit to mission accomplishment?	30	38	24	5	2	16	30	40	12	3

	Under Garrison Conditions					Under Combat Conditions				
	Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
39. Without asking your source of supply, how often do you have difficulty in telling the difference between what is and what is not considered authorized by the logistic system for the following types of items?										
LDNG/LDNC a. items/services necessary to mission accomplishment?	22	31	31	14	2	25	30	28	14	3
LDPG/LDPC b. items/services potentially contributing to mission accomplishment?	17	32	36	13	2	16	37	31	13	3
LDBG/LDBC c. items of no benefit to mission accomplishment?	28	28	22	15	7	27	30	24	12	8

On occasion it has been said that the logistic system refuses to issue to units or individuals items that they believe they need. For example, people may disagree on the type of items, such as whether tent floors are needed under combat conditions. Or people may disagree on the quantity of an item, such as whether ammunition above certain prescribed allowances is required. USE THIS AS BACKGROUND FOR QUESTIONS #40 and #41.

		Under Garrison Conditions					Under Combat Conditions				
		Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
40.	In your experience, has the <u>logistic system</u> for any reason <u>refused</u> to authorize for issue or requisition by you, your buddies, or your unit, any items which you believed were:										
LRNG/LRNC	a. items/services necessary to mission accomplishment?	21	27	37	13	2	27	35	23	13	1
LRPG/LRPC	b. items/services potentially contributing to mission accomplishment?	12	24	45	18	2	17	33	33	15	3
LRBG/LRBC	c. items of no benefit to mission accomplishment?	16	15	26	27	16	17	17	31	24	12

		Under Garrison Conditions					Under Combat Conditions				
		Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
41.	Suppose that a desired item or service is <u>not authorized by the logistic system</u> . How often would you consider use of <u>irregular logistic procedures</u> to be <u>justified</u> when the item is an:										
LJNG/LJNC	a. item/service necessary to mission accomplishment?	9	11	27	34	19	4	8	16	31	41
LJPG/LJPC	b. item/service potentially contributing to mission accomplishment?	10	16	46	21	7	6	11	32	32	20
LJBG/LJBC	c. item of no benefit to mission accomplishment?	42	33	17	6	2	32	30	26	7	6

In Question #42, if YOU HAVE HAD COMBAT EXPERIENCE, answer for BOTH "Garrison" and "Combat" conditions.

If YOU HAVE HAD NO COMBAT EXPERIENCE, answer ONLY for "Garrison" conditions.

		Under Garrison Conditions					Under Combat Conditions				
		Encourage a lot	Encourage somewhat	Neither encourage nor discourage	Discourage somewhat	Discourage a lot	Encourage a lot	Encourage somewhat	Neither encourage nor discourage	Discourage somewhat	Discourage a lot
42.	Individuals who work together often share the same ideas about what people should do. Indicate to what extent the <u>work groups</u> to which you have belonged have encouraged or discouraged each of the following:										
WAG/WAC a.	A high skill level on the job	55	28	14	3	0	80	11	7	2	0
WBG/WBC b.	The use of irregular procedures which <u>reduce</u> flight safety	8	9	9	20	54	12	5	8	27	48
WCG/WCC c.	A high sense of motivation and esprit	41	30	22	5	3	79	11	5	2	1
WDG/WDC d.	Teamwork	52	27	17	4	0	85	10	4	0	0
WEG/WEC e.	Fostering of group welfare	29	31	34	4	2	64	28	7	0	1
WFG/WFC f.	A high sense of duty	41	31	22	5	2	83	12	5	0	0
WGG/WGC g.	Giving top priority to flight safety	64	21	10	4	0	62	27	8	2	0
WHG/WHC h.	Avoidance of work	5	11	21	22	40	6	7	5	11	71
	i. Compliance with wishes of superiors:										
WIG/WIC	(1) For well-liked superiors	50	34	12	2	2	69	21	8	1	1
WJG/WJC	(2) For strongly disliked superiors	14	20	33	17	16	23	25	29	11	13
	j. Compliance with wishes of superiors:										
WKG/WKC	(1) For highly respected superiors	57	32	9	1	1	80	15	5	1	0
WLG/WLC	(2) For superiors who have not earned respect	9	26	35	16	13	17	25	34	16	8
	k. Following regulations:										
WPG/WPC	(1) Without question at all times	21	40	26	9	4	31	40	17	10	2
WHG/WHC	(2) Only when they appear reasonable	15	38	29	14	5	20	30	24	20	7
	l. Use of irregular procedures to:										
WOG/WOC	(1) Insure the mission gets accomplished	28	37	16	10	9	56	21	10	11	0
WPG/WPC	(2) Get the job done faster	17	37	21	17	9	44	31	8	13	4
WQG/WQC	(3) Improve work group prestige	18	30	29	11	12	33	28	25	10	5
WRG/WRC	(4) Improve group living conditions	21	26	32	11	9	39	30	26	2	4

In Questions 43-46, "demand" means any of the three types of demand described as necessary to, potentially contributing to, or of no benefit to mission accomplishment.

In these questions, "an item or service authorized by the logistic system" means an item authorized for issue, for an authorized purpose, from an authorized source.

43. In this question, you are asked why people sometimes use irregular logistic procedures to fill a demand for an item or service even when it is not authorized by the logistic system.

Indicate how much influence you think each of the reasons given below has in the decisions of people to use an irregular logistic procedure or not to meet the demand for an unauthorized item or service.

	Under All Conditions				
	Strong influence to use irregular logistic procedures	Some influence to use irregular logistic procedures	Not an influence	Some influence to not meet the demand	Strong influence to not meet the demand
Na. To keep from working hard.	11	36	45	6	2
Nb. To be accepted by friends.	9	28	53	7	3
Nc. To avoid punishment by the military chain of command.	15	28	38	14	3
Nd. To maintain safety standards.	21	37	24	11	7
Ne. To please superiors.	19	45	26	8	3
Nf. To demonstrate initiative.	20	44	27	8	1
Ng. To comply with written logistic procedures.	10	28	46	13	3
Nh. To obtain promotions, commendations, or other military rewards.	17	29	41	9	4
Ni. To demonstrate how well they can do the job.	21	46	27	5	1
Nj. To speed up their work.	22	50	19	6	2
Nk. To accomplish the unit mission.	37	44	14	5	1
Nl. To demonstrate independence from authority.	12	27	51	8	3
Nm. Because of fear of superiors.	12	23	48	11	6
Nn. For "kicks."	6	11	63	7	14
No. To acquire items for their own personal gain.	9	28	49	6	9
Np. To gain a reputation as a scrounger.	11	30	46	7	6
Nq. Because of a sense of duty.	14	43	33	7	3
Nr. To acquire items for the personal gain of others.	6	19	58	9	8
Ns. To improve or maintain their unit's reputation.	20	43	27	8	2
Nt. Because of threats from a fellow worker.	4	11	65	3	12
Uu. Because they feel the task is important.	21	49	21	5	4
Nv. To comply with direct orders from superiors.	24	40	25	7	4
Nw. To help others do their job.	14	51	28	5	2
Nx. Because of a desire to "beat the System."	13	26	49	7	5

VARIABLE CODING DESIGNATIONS

44. In this question, you are asked why people sometimes use irregular logistic procedures to fill a demand for an item when the item is *authorized but is definitely not available in time*. In a case like this, they are deciding whether to use an irregular logistic procedure or accept being late using prescribed procedures.

Indicate how much influence each of the reasons given below has in decisions of this kind.

	Under all conditions				
	Strong influence to use irregular logistic procedures	Some influence to use irregular logistic procedures	Not an influence	Some influence to accept being late	Strong influence to accept being late
Ua. To demonstrate initiative.	25	42	29	4	0
Ub. Because they feel the task is important.	32	50	13	4	1
Uc. Because of threats from a fellow worker.	3	11	73	5	8
Ud. To demonstrate how well they can do the job.	16	50	27	7	0
Ue. To keep from working hard.	9	21	35	11	5
Uf. To comply with written logistic procedures.	7	22	47	17	6
Ug. To demonstrate independence from authority.	8	22	37	8	4
Uh. To avoid punishment by the military chain of command.	10	17	30	15	8
Ui. To acquire items for the personal gain of others.	6	15	35	6	9
Uj. To avoid paperwork.	12	33	43	9	4
Uk. To gain a reputation as a scrounger.	8	24	38	6	5
Ul. To be accepted by friends.	7	19	33	5	6
Um. To accomplish the unit mission.	42	41	9	7	2
Un. To acquire items for their own personal gain.	6	22	59	7	7
Uo. To speed up their work.	18	45	28	6	4
Up. To improve or maintain their unit's reputation.	22	43	26	7	2
Uq. Because of fear of superiors.	11	21	55	9	5
Ur. To maintain safety standards.	24	31	29	9	7
Us. To obtain promotions, commendations, or other military rewards.	14	28	47	5	6
Ut. For "kicks."	4	8	68	9	12
Uu. To comply with direct orders from superiors.	21	41	23	11	4
Uv. To help others do their job.	13	51	30	4	2
Uw. To please superiors.	14	44	34	4	3
Ux. Because of a desire to "beat the System."	6	22	60	7	6
Uy. Because of a sense of duty.	15	47	30	4	4
Uz. To provide a change in routine.	6	15	68	3	7

45. When an individual uses an irregular logistic procedure in response to instructions from military superiors, does responsibility for any resulting violation of the law or regulations lie with the individual or with the military superiors?

LVS a. How do you think it should be?

LVP b. How do you think it is in practice?

Under All Conditions

With Military Superiors	With the Individual	With Both	Depends on Circumstances
43	8	28	21
11	33	26	30

46. In this question, you are asked why people sometimes use irregular logistic procedures to meet a demand for an item that is *authorized and available through prescribed procedures*. In a case like this, they are deciding whether or not to use the irregular procedure even though the item can be obtained through the prescribed procedure.

Indicate how much influence you think each of the reasons given has in this kind of situation.

VARIABLE CODING DESIGNATIONS

Ma. To demonstrate initiative.

Mb. To demonstrate how well they can do the job.

Mc. To keep from working hard.

Md. To comply with written logistic procedures.

Me. To demonstrate independence from authority.

Mf. To acquire items for their own personal gain.

Mg. To acquire items for the personal gain of others.

Mh. To avoid paperwork.

Mi. To gain a reputation as a scrounger.

Mj. To be accepted by friends.

Mk. To accomplish the unit mission.

ML. To speed up their work.

Mm. To improve or maintain their unit's reputation.

Mn. To maintain safety standards.

Mo. Because of threats from a fellow worker.

Mp. To comply with direct orders from superiors.

Mq. Because of fear of superiors.

Mr. To please superiors.

Ms. To obtain promotions, commendations, or other military rewards.

Mt. Because they feel the task is important.

Mu. Because of a desire to "beat the System."

Under All Conditions				
Strong influence to use irregular logistic procedures	Some influence to use irregular logistic procedures	Not an Influence	Some influence to use prescribed logistic procedures	Strong influence to use prescribed logistic procedures
12	24	41	12	11
11	27	32	16	13
9	31	43	10	7
4	16	42	20	19
7	21	57	11	4
9	22	57	7	5
5	22	60	7	7
15	38	34	9	5
12	26	52	6	4
6	15	56	8	5
25	34	16	12	13
20	44	22	8	6
15	32	32	12	9
14	23	31	11	21
4	8	77	4	8
15	30	29	13	14
6	19	55	11	9
12	33	33	14	8
11	20	50	9	10
15	53	23	12	12
12	19	56	6	6

46. (continued)

- Hv. To prepare for future needs for similar items (to help gain independence from the supply system).
- Hw. To avoid punishment by the military chain of command.
- Hx. To help others do their job.
- Hy. Because of a sense of duty.
- Hz. For "kicks."
- Haa. To provide a change in routine.

Under All Conditions				
Strong influence to use irregular logistic procedures	Some influence to use irregular logistic procedures	Not an influence	Some influence to use prescribed logistic procedures	Strong influence to use prescribed logistic procedures
19	39	26	18	9
7	13	32	16	13
11	34	34	13	8
10	29	35	16	11
6	9	72	5	9
6	14	67	7	6

VARIABLE CODING DESIGNATIONS

In Questions 47-50, answer the questions for BOTH "Under garrison conditions" and "Under combat conditions," REGARDLESS OF WHETHER YOU HAVE HAD ANY COMBAT EXPERIENCE.

- LSC3/LSCC 47. How frequently can unauthorized short cuts be used to make helicopter maintenance faster or easier without reducing the quality of the results? CIRCLE THE NUMBER OF THE APPROPRIATE ANSWERS FOR BOTH GARRISON AND COMBAT.

Under Garrison Conditions					Under Combat Conditions				
Never	Seldom	Sometimes	Often	Always	Never	Seldom	Sometimes	Often	Always
14	16	40	27	3	13	11	30	39	7

3.0

SORTED ROTATED FACTOR LOADINGS

sorted rotated factor loadings (pattern) Logistic Situation Variables, Garrison*

	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6	factor 7	factor 8
ldpg	0.906	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ldng	0.875	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ldbg	0.755	0.000	0.000	0.000	0.000	0.000	0.000	0.000
lpng	0.000	0.882	0.000	0.000	0.000	0.000	0.000	0.000
lnpg	0.000	0.849	0.000	0.000	0.000	0.000	0.000	0.000
lpg	0.000	0.811	0.000	0.000	0.000	0.000	0.000	0.000
lrg	0.000	0.000	0.828	0.000	0.000	0.000	0.000	0.000
lrbg	0.000	0.000	0.766	0.000	0.000	0.000	0.000	0.000
lrbg	0.000	0.000	0.721	0.000	0.000	0.000	0.000	0.000
ljpg	0.000	0.000	0.000	0.816	0.000	0.000	0.000	0.000
ljb	0.000	0.000	0.000	0.766	0.000	0.000	0.000	0.000
ljng	0.000	0.000	0.000	0.690	0.000	0.000	0.000	0.000
lnpog	0.000	0.000	0.000	0.000	0.893	0.000	0.000	0.000
lmg	0.000	0.000	0.000	0.000	0.867	0.000	0.000	0.000
lrrg	0.000	0.000	0.000	0.000	0.000	0.821	0.000	0.000
lilg	0.000	0.000	0.000	0.000	0.000	0.786	0.000	0.000
lrig	0.000	0.000	0.000	0.000	0.000	0.616	0.000	0.000
lang	0.000	0.000	0.000	0.000	0.000	0.000	0.869	0.000
lapg	0.000	0.000	0.000	0.000	0.000	0.000	0.858	0.000
labg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.848
lnbg	0.264	0.000	-0.271	0.000	0.000	0.000	0.000	0.586
lscg	0.000	0.000	0.270	0.355	0.000	0.000	0.000	0.000

*variable explanations are given in Section 2 of this Appendix, pages 8-11, 16(question 47)

sorted rotated factor loadings (pattern)

Logistic Situation Variables, Combat*

	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6	factor 7	factor 8
ldpc	0.927	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ldnc	0.860	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ldbc	0.772	0.000	0.000	0.000	0.000	0.000	0.000	0.000
lpwc	0.000	0.873	0.000	0.000	0.000	0.000	0.000	0.000
lnpc	0.000	0.824	0.000	0.000	0.000	0.000	0.000	0.000
lpwc	0.000	0.803	0.000	0.000	0.000	0.000	0.000	0.000
lapc	0.000	0.000	0.876	0.000	0.000	0.000	0.000	0.000
lanc	0.000	0.000	0.790	0.000	0.000	0.000	0.000	0.000
labc	0.000	0.000	0.698	0.000	0.000	0.000	0.000	0.000
lrnc	0.000	0.000	0.000	0.920	0.000	0.000	0.000	0.000
lrpc	0.000	0.000	0.000	0.914	0.000	0.000	0.000	0.000
ljnc	0.000	0.000	0.000	0.000	0.856	0.000	0.000	0.000
ljpc	0.000	0.000	0.000	0.000	0.780	0.000	0.000	0.374
lilc	0.000	0.000	0.000	0.000	0.000	0.814	0.000	0.000
lrrc	0.000	0.000	0.000	0.000	0.000	0.803	0.000	0.000
lric	0.000	0.000	0.000	0.000	0.307	0.626	0.000	0.000
lnpoc	0.000	0.000	0.000	0.000	0.000	0.000	0.871	0.000
lnnc	0.000	0.000	0.000	0.000	0.000	0.000	0.820	0.000
ljbc	0.000	0.000	0.000	0.000	0.283	0.000	0.000	0.802
lnbc	0.000	0.000	0.000	0.000	0.000	0.000	0.348	0.666
lrbc	0.000	0.000	0.000	0.409	0.435	0.000	0.000	-0.423
lscc	0.000	0.000	0.000	0.000	0.342	0.000	0.000	0.000

*variable explanations are given in Section 2 of this Appendix, pages 8-11, 16(question 47)

Types of Irregular Logistic Procedures, Garrison+

sorted rotated factor loadings (pattern)

	factor 1	factor 2	factor 3
pung	0.838	0.000	0.000
pufg	0.810	0.000	0.000
puug	0.746	0.000	0.000
poig	0.717	0.000	-0.273
pueg	0.577	0.252	0.000
puag	0.546	0.358	0.000
pupg	0.520	0.340	-0.255
pubg	0.000	0.788	0.000
pf dg	0.000	0.735	0.000
pugg	0.000	0.724	0.000
pucg	0.000	0.000	0.809
ptig	0.000	0.000	0.735
ptg	0.000	0.449	0.510
pidg	0.000	0.498	0.000
pusg	0.395	0.000	0.000

*Variable explanations given in Section 2 of this appendix, page 7

Types of Irregular Logistic Procedures, Combat*

sorted rotated factor loadings (pattern)

	factor 1	factor 2	factor 3
punc	0.851	0.000	0.000
pufc	0.797	0.000	0.000
poic	0.751	0.000	0.000
pucc	0.718	0.000	0.000
pupc	0.662	0.000	0.000
puuc	0.644	0.000	0.000
puac	0.614	0.000	0.000
pubc	0.000	0.770	0.000
pfdc	0.000	0.751	0.000
pugc	0.000	0.733	0.000
ptc	0.000	0.688	0.000
pidc	0.000	0.630	0.000
pucc	0.000	0.000	0.820
ptic	0.000	0.000	0.793
pusc	0.368	0.261	0.000

*variable explanations given in Section 2 of this Appendix, page 7.

sorted rotated factor loadings (pattern) Group Norms, Garrison*

	factor 1	factor 2	factor 3	factor 4	factor 5
wf9	0.899	0.000	0.000	0.000	0.000
wd9	0.889	0.000	0.000	0.000	0.000
wc9	0.854	0.000	0.000	0.000	0.000
weg	0.770	0.000	0.000	0.000	0.000
wag	0.545	0.000	0.000	0.000	0.000
w99	0.514	0.000	0.284	0.000	0.000
wq9	0.000	0.866	0.000	0.000	0.000
w09	0.000	0.846	0.000	0.000	0.000
wpg	0.000	0.812	0.000	0.000	0.000
wr9	0.000	0.801	0.000	0.000	0.000
wig	0.000	0.000	0.919	0.000	0.000
wk9	0.000	0.000	0.892	0.000	0.000
wj9	0.000	0.000	0.000	0.922	0.000
wlg	0.000	0.000	0.000	0.909	0.000
wbg	0.000	0.000	0.000	0.000	0.785
whg	-0.261	0.000	0.000	0.000	0.594
wng	0.000	0.000	0.000	0.000	0.470
wmg	0.000	0.000	0.360	0.000	0.000

*variable explanations given in Section 2 of this Appendix, page 12.

sorted rotated factor loadings (pattern) Group Norms, Combat*

	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6
wcc	0.904	0.000	0.000	0.000	0.000	0.000
wpc	0.884	0.000	0.000	0.000	0.000	0.000
wqc	0.620	0.000	0.000	0.000	0.000	0.537
wnc	0.000	0.796	0.000	0.000	0.000	0.000
wic	0.386	0.621	0.000	0.000	-0.435	0.000
wkc	0.000	0.609	0.000	0.000	0.000	0.000
wac	0.000	0.569	0.000	0.000	0.000	0.258
wgc	-0.349	0.567	0.000	0.000	0.000	0.295
wlc	0.000	0.000	0.928	0.000	0.000	0.000
wjc	0.000	0.000	0.895	0.000	0.000	0.000
wec	0.000	0.000	0.000	0.827	0.000	0.000
wnc	0.000	0.000	0.000	0.582	0.383	0.000
wdc	-0.297	0.000	0.000	0.531	-0.254	0.000
whc	0.000	0.000	0.000	0.000	0.762	0.000
wcc	0.000	0.000	0.000	0.531	-0.567	0.000
wrc	0.000	0.000	0.000	0.000	0.000	0.855
wfc	0.000	0.000	0.000	0.000	0.000	0.485
wbc	0.000	0.000	-0.365	0.000	0.469	0.000

*variable explanations are given in Section 2 of this Appendix, page 12.

sorted rotated factor loadings (pattern) Individual Incentives, Unauthorized Items*

	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6
uu	0.810	0.000	0.000	0.000	0.000	0.000
uv	0.688	0.000	0.316	0.000	0.000	0.000
uw	0.678	0.000	0.000	0.000	0.000	0.000
uq	0.675	0.000	0.000	0.000	0.000	0.000
uk	0.627	0.000	0.000	0.000	0.322	0.000
us	0.594	0.000	0.296	0.000	0.000	-0.306
uj	0.000	0.826	0.000	0.000	0.000	0.000
ur	0.000	0.790	0.000	0.000	0.000	0.000
ua	0.000	0.676	0.000	0.000	0.000	0.000
u	0.000	0.644	0.000	0.000	0.000	0.000
ux	0.000	0.568	0.000	0.000	0.312	0.000
ut	0.000	0.547	0.000	0.345	-0.311	0.000
uc	0.000	0.000	0.692	0.000	0.000	0.299
uh	0.000	0.000	0.685	0.000	0.000	0.000
uh	0.000	0.314	0.563	0.000	0.000	0.000
ua	0.000	0.000	0.000	0.745	0.000	0.000
ub	0.000	0.000	0.000	0.664	0.000	0.000
uj	0.000	0.000	0.000	0.000	0.632	0.000
ug	0.000	0.000	0.000	0.307	0.000	0.693
ud	0.000	0.000	0.000	0.000	0.000	0.598
ui	0.329	0.000	0.384	0.000	0.310	0.000
ul	0.000	0.000	0.287	0.406	0.388	0.000
uf	0.266	0.000	0.264	0.000	0.494	0.000
uz	0.000	0.000	0.473	0.000	0.365	0.000

*variable explanations given in Section 2 of this Appendix, page13

sorted rotated factor loadings (pattern) Individual Incentives, Authorized Items Not Available*

	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6
ub	0.785	0.000	0.000	0.000	0.000	0.000
uv	0.773	0.000	0.000	0.000	0.000	0.000
up	0.713	0.000	0.000	0.000	0.000	0.000
uy	0.708	0.000	0.000	0.000	0.000	0.000
un	0.684	0.000	0.000	0.000	0.000	0.000
ur	0.664	0.000	0.000	0.000	0.000	0.000
un	0.000	0.807	0.000	0.000	0.000	0.000
ui	0.000	0.725	0.000	0.000	0.000	0.000
ut	0.000	0.612	0.000	0.000	0.000	0.000
ux	0.279	0.581	0.000	0.000	0.000	0.000
uz	0.000	0.564	0.000	0.000	0.282	0.254
us	0.000	0.000	0.661	0.000	0.000	0.000
ua	0.405	0.000	0.563	0.000	0.000	0.000
ul	0.000	0.310	0.532	0.000	0.000	0.000
uq	0.000	0.000	0.000	0.815	0.000	0.000
uh	0.000	0.000	0.000	0.645	0.000	0.309
uu	0.000	0.000	0.000	0.640	0.000	0.000
uj	0.000	0.000	0.000	0.000	0.702	0.000
uf	0.000	0.000	0.000	0.253	0.000	0.766
uc	0.000	0.477	0.388	0.000	0.000	0.000
uo	0.387	0.406	0.000	0.000	0.400	0.000
ue	0.000	0.000	0.000	0.000	0.464	0.497
uw	0.316	0.000	0.294	0.380	0.326	0.000
ug	0.000	0.254	0.451	0.000	0.000	0.467
ud	0.390	0.000	0.418	0.000	0.314	0.000
uk	0.000	0.000	0.451	0.000	0.488	0.000

*variable explanations given in Section 2 of this Appendix, page 14.

sorted rotated factor loadings (pattern) Individual Incentive, Authorized Items Available*

	factor 1	factor 2	factor 3	factor 4	factor 5
hk	0.814	0.000	0.000	0.000	0.000
hx	0.684	0.000	0.000	0.266	0.000
ht	0.656	0.321	0.000	0.000	0.000
hy	0.648	0.000	0.000	0.000	0.000
hl	0.630	0.000	0.369	0.000	0.000
hm	0.628	0.000	0.000	0.000	0.000
hn	0.622	0.000	0.000	0.000	0.000
hq	0.000	0.858	0.000	0.000	0.000
hr	0.000	0.754	0.000	0.000	0.000
hp	0.338	0.702	0.000	0.000	0.000
hs	0.000	0.701	0.000	0.000	0.000
hw	0.000	0.503	-0.284	0.268	0.000
hg	0.000	0.000	0.823	0.000	0.000
hf	0.000	0.000	0.753	0.000	0.000
hh	0.000	0.000	0.605	0.000	0.000
hi	0.000	0.000	0.568	0.000	0.000
hu	0.000	0.000	0.000	0.837	0.000
haa	0.000	0.000	0.000	0.648	0.000
hz	0.000	0.000	0.313	0.590	0.000
hv	0.406	0.000	0.000	0.539	0.000
hb	0.000	0.000	0.000	0.000	0.750
ha	0.000	0.000	0.000	0.000	0.744
hj	0.000	0.000	0.446	0.000	0.534
hc	0.000	0.000	0.000	0.295	0.529
hd	0.369	0.000	0.000	0.000	0.461
ho	-0.352	0.000	0.000	0.000	0.396
he	0.000	0.299	0.000	0.430	0.000

*variable explanations given in Section 2 of this Appendix, pages 15, 16.

4.0

SUMMARY CHARTS

(Grouping)

VARIABLES*	Garrison						Combat						VARIABLES*
	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction	
lnpg	x		x							x			lnpc
lpmg				x									lpmc
lpwg													lpwc
lilg											x		lilc
lrrg							x			x	x		lrrc
lrig							x			x	x		lric
lang								x					lanc
lapg													lapc
labg									x				labc
lnng		x		x			x	x	x			x	lnnc
lnpog		x		x			x	x	x			x	lnpoc
lnbg		x										x	lnbc
lnwg				x									lnwc
lwpg				x									lwpc
lwbg													lwbc
lfng		x		x			x			x	x	x	lfnc
lfpq		x					x	x			x	x	lfpc
lfbg						x	x				x		lfbc
ldng			x									x	ldnc
ldpg													ldpc
ldbg				x					x				ldbc
lrng	x		x	x		x	x	x		x			lrnc
lrpg	x	x	x	x		x	x	x		x			lrpc
lrbg		x					x	x					lrbc
ljng		x						x				x	ljnc
ljpg													ljpc
ljbq												x	ljbc
lvs													
lvp													
lscg										x			lsc

*Variable definitions are found on pages 8-11, 15, and 16 of Questionnaire, Appendix C.

GROUP NORMS (Group Sets)													
TYPES OF IRREGULAR PROCEDURES (Group Sets)							GROUP NORMS (Group Sets)						
Garrison							Combat						
VARIABLES*	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction	VARIABLES*	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction
ptlg	x						plig	x					
pucg	x						pucg						
pidg							pidc						
pusg							pusc						
puby							pubc						
pufg							pufc						
pueg							puec						
ptg							ptc						
pumg							pumc						
puig							puic						
poig							poic						
pupg							pupc						
puag							puac						
pugg							pugc						
pfdg							pfdc						

*Variable definitions are found on page 7 of Questionnaire, Appendix C.

*Variable definitions are found on page 12 of Questionnaire, Appendix C.

INDIVIDUAL INCENTIVES
(Group Sets--Garrison Only)

Abbreviated Incentive Designation	VARIABLES*	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction	VARIABLES*	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction	VARIABLES*	Service	Rank	Career	Work Group	Combat/Garrison	Job Satisfaction
Acceptance by friends	uj							hj	x						nb						
Accomplish unit mission	um	x	x					hk							nk		x				
Avoid punishment by superiors	uh							hw							nc	x					
Avoid paperwork	uj							hh			x				-						
Beat the system	ux							hu							ux						
Change from routine (boredom)	uz							haa							-						
Comply with direct orders	uu				x			hp					x		nv	x			x		
Comply with written SOP	uf					x		hd							ng						
Demonstrate competence	ud		x					hb							ni		x				
Demonstrate independence	ug							he							nl						
Demonstrate initiative	ua		x					ha							nf						
Fear of superiors	uq							hq							nm						
Help others do their job	uv		x					hx							nw						
Keep from working hard	ue							hc							na						
Kicks	ut							hz							nn						
Military Rewards (promotion, etc)	us							hs							nh						
Prepare for future needs	-							hv					x		-						
Personal gain	un					x		hf							no						
Personal gain of others	ui							hg							nr	x					
Please superiors	uw		x					hr							nz	x					
Scrounger reputation	uk							hi			x				np						
Maintain safety standards	ur	x	x					hn	x						nd	x					
Sense of duty	uy	x			x			hy					x		nq	x					
Speed up work	ug							hl							nj						
Task is important	ub	x						ht				x			nu	x	x		x		
Threats from peer	uc							ho							nt						
Unit reputation	up	x						hm							ns						

*Variable definitions are found on pages 13-16 of Questionnaire, Appendix C.

5.0

EXCERPTED COMMENTS

At the end of survey questionnaire, respondents were invited to make additional comments "on the survey, or on anything else concerning the use of irregular logistic procedures which came to mind as you completed the survey." 103 respondents (41% of the total sample) made use of this opportunity. As a group, these 103 respondents tend to be more dissatisfied with military service as a career than the average, but not to a statistically significant degree. It should be noted that, while these comments are useful in providing insight on views held among service personnel, they should not be considered representative of all servicemen. Further, since the sample was drawn from personnel at the unit and unit support levels who may be unfamiliar with the "big picture" of military logistics, these comments should not necessarily be viewed as the observations of individuals with expert knowledge of the logistic system. For example, what is called "inefficiency" may actually be the results of priorities operating within budget constraints.

Most responses to this final "open" question can be grouped among eight general categories or themes:

- The pressure of readiness standards maintained by the senior command is the driving force behind most irregular logistic phenomena;
- The relative speed/efficiency of irregular procedures or relative slowness of response of prescribed procedures encourages the use of irregular logistic procedures;
- The inefficiency of procurement/the supply system in general encourages the use of irregular logistic procedures;
- The inefficiency/ignorance of personnel outside of logistic channels leads to their use of irregular logistic procedures;
- Excessive paperwork involved in the use of prescribed procedures encourages the use of irregular logistic procedures;

- The lack of spare (repair) parts encourages the use of irregular logistic procedures; and
- Specific recommendations for improvement of logistics.

5.1 OPERATIONAL READINESS/COMMAND PRESSURE

Many of the officers and warrant officers who responded to this "open question" mentioned operational readiness and/or command pressure as the driving force behind the use of most irregular logistic procedures. Sample comments of both officers and enlisted personnel include the following:

"Without irregular procedures, my unit would probably drop about 30-40% off its aircraft availability rate."

"The biggest reason for irregular logistic procedures is to get an aircraft in the air. The demands of maintaining a certain O.R. rate put on the Commander leaves no choice but to use irregular means because their careers ride on them. As a maintenance officer, it is my job to keep the O.R. rate up--or it's my job. The supply system is so slow that you can't live with it, and it forces you to use irregular means."

"More emphasis should be placed on a supervisor's ability and experience to know what needs to be available to do his job better. In a combat situation, a supervisor is measured by how well and how fast he gets a job done--not how he does it."

"If we did not check with other units for an item, aircraft would be down too much time--just today we cheated on one unit to help another."

"Irregular procedures used most for hard-to-get parts, usually small items. Use of irregular procedures depends on command pressure (real or otherwise). Supply system will work if given chance."

"There has been a great deal of pressure on me to meet availability standards. I honestly feel that I could have done so without the swap, spare parts, and assistance from sister units by cannibalization (unauthorized but agreed upon by both parties...no theft has occurred)."

5.2 RELATIVE SPEED OR EFFICIENCY OF IRREGULAR LOGISTIC PROCEDURES

Many of these same respondents also cited the relative speed or efficiency of irregular logistic procedures compared to their perceptions of prescribed procedures. Several of these comments also indicated awareness of some of the problems caused by irregular procedures. The following are typical:

"Dedication to mission accomplishment and the lack of timely receipt of parts causes irregular log to occur. Need to be sure we control cannibalization and always get back to the system so that demand for the item is in the pipeline."

"Because of the excessive number of days that it takes to receive NORS parts, unauthorized irregular procedures are necessary to enable the units to meet DA minimum requirements."

"The supply system is too slow and unresponsive. Both controlled substitution/scrounging are absolutely necessary for survival."

"In combat situations, I feel the logistic system could not begin to meet unit demands in a timely manner. This will encourage or result in the flight safety and flight/airframe reliability being reduced. Bottom line for me as a maintenance officer, I am scared to meet an aggressor under current logistics procedures."

5.3 INEFFICIENCY OF THE SYSTEM

A number of comments did not point to the supply system per se as unresponsive but referred to the procurement system as indirectly contributing to the use of irregular logistic procedures:

"Irregular procedures caused by procurement people not doing their job. Contracts are let to people who cannot make the part and default; the item manager cancelling back requisitions because parts were not available..."

"In our line of maintenance, there's nothing more disheartening than to receive a new part that doesn't meet specs. The quality control system for civilian contracts to this Military is deplorable."

"I believe that our biggest problem is trying to run an organization on a budget. There is a need to control spending but I believe if we are going to support our units' missions, we should be able to do so at all times and not just when a combat situation arises."

5.4 INEFFICIENCY/IGNORANCE OF PERSONNEL

Other comments attributed the use of irregular logistic procedures to the ignorance or inefficiency of personnel outside the logistic channels:

"Scrounging is basically dangerous because it bastardizes the system...I think that a lot of the problem lies in that people at user level do not know intricacies of supply system well enough. The people at the user level change all the time and each has varying levels of experience in using the sytem. This sometimes causes scrounging--the poor guy just doesn't know how to work present system and it's quicker to scrounge than go through myriad regs governing the system."

"Supply and maintenance do not talk the same language. Each continually baffles the other behind a myriad of letters, symbols, acronyms, and jargon. Communication is difficult. FEW understand it. Irregular logistic procedures result."

"Lack of understanding of the system causes the problem. System gets blamed even when not used properly..."

"The problem is education. Mechanics are not trained in how to use the priority system--they don't know how to procure a part properly. NORS should be used more."

"The basics are missing. If an individual cannot read and understand English, they should not be allowed in the Service. If there is an easy way to do it, it will be done. The system is too complicated for today's average soldier. System works well as written, but one person or machine can break the chain."

5.5 EXCESSIVE PAPERWORK

Relatively few respondents referred explicitly to the paperwork associated with the use of prescribed procedures as a motivation behind the use of irregular logistic procedures. The following are typical comments:

"Paperwork required is more than any unit supply sgt. and clerk can do. 36D3 computer has so many drawbacks that supply rooms keep records manually to keep track of equipment."

"We in our section have to throw away periodically all unauthorized parts for the sole purpose of an inspection...Most of these supplies or parts end up in the dumpster because of the paperwork involved in turning them back into supply."

"If a maintenance officer did not use the scrounge method for accumulating parts he would cut his own throat. We have placed so many stops in the supply system that it takes nearly four times as long to receive that part as it would take normally. We have created a tremendous paperwork mountain to receive parts that are held at the local level."

5.6 LACK OF SPARE (REPAIR) PARTS

Several respondents suggested that neither the logistic system nor the operational personnel were responsible for the use of irregular procedures, but believed that a general lack of sufficient spare (repair) parts was the driving force. These comments included the following:

"Our biggest problem in helicopter logistics is not so much delivery time and priority of demands, but the lack of spare parts in the entire military inventory for all types of helicopters."

"If serious consideration is to be given to eliminating irregular logistic procedures, then the amount of spare assets must be increased. This is not easy, obviously, since we're talking big \$. However, something must be done for overseas units."

"The Government needs to spend more money on spares and expedite the movement system. The Government would save money by letting the computer through computer links lateral supplies automation, instead of the present lateral system by telephone."

5.7 SPECIFIC RECOMMENDATIONS

Many of the criticisms or observations on the causes of irregular logistic procedures were accompanied by suggestions either for eliminating the perceived need for irregular logistic procedures or for increasing the decision latitude available to supervisors in reference to stockpiling, local purchase, and controlled cannibalization. A few of these recommendations are excerpted below:

"Our AWP status would be greatly reduced if we were authorized local purchase of items that take months to obtain through supply."

"Considerable thought should be devoted to allowing unit commanders to be more independent in the management of their funds, i.e., allowing more local, off-base purchases. Decrease dependence on contractual agreements that tend to be too costly for the supplies or services rendered."

"Cannibalization should be authorized for items needed to complete mission when supply can't get it. Find out why people don't like the paperwork."

"The utilization of an SSL at AVIM level should be utilized to its fullest. The AVIM Commander should ensure the SSL is used and should be given a say on what he wished in that SSL--no questions."

APPENDIX D

DIFFERENCES AMONG COMPONENT GROUPS WITHIN THE SAMPLE

APPENDIX D

DIFFERENCES AMONG COMPONENT GROUPS WITHIN THE SAMPLE

1.0 SAMPLE COMPOSITION BY GROUP

The respondent sample was analyzed for differences among component groups by function, attitude, and experience, comprising six group sets. The component groups and the population of each group by armed service are set forth in Table D-1-1. All group analyses except the analysis by Service were performed for the total sample without differentiation by Service. The breakout of these groups by Service in Table D-1-1 is to facilitate evaluation of the impact of sample composition on apparent interservice differences. Note that the average size of the population groups is approximately 65, with minimum size of 20. A summary breakout of group set differences by logistic situation, type procedure, group norms, and individual incentives was provided in Section 2 of this report, Table 2-2. A more detailed breakout by question is provided in Appendix C, Section 4.

1.1 GENERAL APPROACH

The general approach used in discussing each set of component groups is patterned on the approach in Sections 2 and 3 of the main text of the Report. First, questions relevant to the situational context (the military logistic situation and the specific types of irregular logistic procedures) are presented. Second, questions relevant to the motivational context (groups norms and specific incentives) are covered. Only statistically significant differences (as defined in Section 2.1, Methodology for Statistical Analysis, of the main text) are included in the discussion of group differences. This Appendix covers these group sets as follows:

Table D-1-1 Group Composition Variances
Affecting Army/AF Data Relationships

Group Population Data

Type Grouping		Total Group Population	Army Portion	Air Force Portion	% AF is of Army
Rank: ^a (garrison)	Enlisted (E1-4)	82	46	36	78
	Junior NCO's (E5-6)	69	37	32	86
	Senior NCO's (E7-9)	40	18	22	122
	Warrant Officers	20	20	0	0
	Officer	40	32	8	25
	Civilian ^b	2	0	2	0
Career ^c (garrison)	Maintenance	179	99	80	81
	Supply	53	33	20	61
	Command	20	20	0	0
Work Groups	A	45		45	100
	B	34		34	100
	C	20		20	100
	D	35	35		0
	E	38	38		0
	F	38	38		0
	G	40	40		0
Combat vs. Garrison Experience	Combat	86	60	26	43
	Garrison	167	93	74	80
Job Satisfaction ^d	Dissatisfied Environment	31	20	11	55
	Dissatisfied Career	55	28	27	96
	Dissatisfied Career & Environment	35	30	5	17
	Satisfied with Everything	130	76	54	71
Army/ Air Force		253	153	100	65

a Totals for some types of groups sum to slightly less than 253 due to missing data.

b The two civilians, air force, were excluded in the group analyses by rank as not a large enough group to be statistically significant.

c Career position held in last relevant noncombat (garrison) position.

d Environment in this case means leader or work group.

- Differences by Rank (Section 2)
- Differences by career field (Section 3)
- Differences by work group/unit (Section 4)
- Differences by type of experience in terms of combat versus no combat (Section 5)
- Differences by job satisfaction (Section 6)
- Interservice differences (Section 7).

2.0 DIFFERENCES BETWEEN RANKS

Differences between personnel divided by military rank--Enlisted (E1-3), Junior NCO's (E4-6), Senior NCO's (E7-9), Warrant Officers, Officers--with respect to attitudes related to the use of irregular logistic procedures were encountered relatively frequently. Out of 201 relevant questions, 60 (30%) reflected a statistically significant difference due to rank of the respondent. Somewhat over half of these differences relate to the motivational context of irregular logistic procedures; somewhat under half pertained to perceptions of the logistic situation and of the utility of irregular logistic procedures.

2.1 THE SITUATIONAL CONTEXT

Significant differences emerged between the ranks on the questions of how often the respondent would feel justified in using irregular logistic procedures, the capability or willingness of the logistic system to respond to demands, the likely reaction of military superiors to the use of irregular logistic procedures, and the impact of specific irregular procedures on overall unit effectiveness.

As illustrated in Table D-2-1, warrant officers and senior NCO's were far more likely to report that the military logistic system never or rarely failed to deliver necessary items when needed under combat conditions. Junior NCO's expressed significantly less confidence in the capability of the logistic system to respond. This finding is particularly significant in light of the results illustrated in Table D-2-2:

TABLE D-2-1 How frequently has the logistic system been unable to furnish authorized items/services necessary to mission accomplishment when needed (under combat conditions)?

Rank	Never or Less Than $\frac{1}{4}$ The Time	One-fourth To One-half The Time	More Than Half The Time	Conf. Level
Enlisted	34%	32%	34%	.01
Junior NCO	24	27	49	
Senior NCO	50	23	26	
War. Off.	68	21	11	
Officer	42	24	34	

TABLE D-2-2 Suppose that an item or service is authorized by the logistic system but not available in time. How often would you consider use of irregular logistic procedures to be justified in the following demand situations?

Nature of Item	Condition	Rank	Never or Seldom	Sometimes	Often or Always	Confidence Level
Necessary to mission accomplishment	Garrison	Enlisted	20%	31%	49%	.00
		Junior NCO	13	28	59	
		Senior NCO	27	27	45	
		War. Off.	5	10	85	
		Officer	5	10	85	
	Combat	Enlisted	17	24	58	.00
		Junior NCO	9	16	75	
		Senior NCO	15	12	72	
		War. Off.	0	5	95	
		Officer	0	5	95	
Potential contribution to mission accomplishment		Enlisted	25	39	36	.01
		Junior NCO	22	56	22	
		Senior NCO	30	45	25	
		War. Off.	5	25	70	
		Officer	15	46	39	
	Combat	Enlisted	19	35	46	.00
		Junior NCO	13	40	47	
		Senior NCO	15	32	52	
		War. Off.	5	21	74	
		Officer	7	20	73	
Unrelated to unit mission	Garrison	Enlisted	65	17	18	.04
		Junior NCO	75	21	4	
		Senior NCO	77	18	5	
		War. Off.	80	5	15	
		Officer	88	10	2	

The general sense of these differences between the ranks is that officers and warrant officers are very likely to feel justified in using irregular logistic procedures to obtain authorized items related to mission accomplishment if the logistic system cannot supply them, particularly under combat conditions. However, under garrison conditions, only a small minority of the officers and warrant officers would feel justified in using such procedures to obtain authorized items unrelated to unit missions, while significantly more enlisted personnel would feel justified in using such procedures under these circumstances.

Tables D-2-3 and D-2-4 provide the responses by rank to similar questions relative to the logistic system's willingness (rather than capability) to respond. Under combat conditions, officers and particularly senior NCO's report more favorable experience in receiving authorization than other ranks for mission-related items. For non-mission related items, only the senior NCO's report significantly more favorable experiences. Under garrison conditions senior NCO's and enlisted men (E1-4) report the most favorable experiences. As noted in Table D-2-4, for demands perceived as necessary to mission accomplishment under combat conditions, officers and senior NCO's are more likely to feel justified in using irregular logistic procedures when the military logistic system fails to authorize issue or requisition. In garrison, warrant officers and junior NCO's are more likely to feel justified.

TABLE D-2-3 In your experience, has the logistic system for any reason refused to authorize for issue or requisition by you, your buddies, or your unit, any items of the following types?

Nature of Item	Condition	Rank	Never or Seldom	Sometimes	Often or Always	Confid. Level
Necessary to Mission Accompl.	Combat	Enlisted	47%	32%	21%	.05
		Junior NCO	62	25	13	
		Senior NCO	85	5	10	
		War. Off.	48	37	15	
		Officer	73	17	10	
Potential Contribution to Mission Accompl.	Garrison	Enlisted	49	33	18	.02
		Junior NCO	26	56	18	
		Senior NCO	47	37	15	
		War. Off.	15	55	30	
		Officer	25	51	24	
	Combat	Enlisted	45	30	25	.01
		Junior NCO	43	40	17	
		Senior NCO	72	20	7	
		War. Off.	37	37	26	
		Officer	49	39	12	
Unrelated to Unit Mission	Garrison	Enlisted	43	26	31	.01
		Junior NCO	22	25	53	
		Senior NCO	37	20	42	
		War. Off.	20	25	55	
		Officer	22	32	46	
	Combat	Enlisted	37	35	28	.05
		Junior NCO	22	35	43	
		Senior NCO	47	15	37	
		War. Off.	37	21	42	
		Officer	32	34	34	

TABLE D-2-4 Suppose that a desired item or service necessary to mission accomplishment is not authorized by the logistic system. How often would you consider use of irregular logistic procedures to be justified in this case?

Condition	Rank	Never or Seldom	Sometimes	Often or Always	Confidence Level
Garrison	Enlisted	29%	30%	31%	.00
	Junior NCO	10	31	59	
	Senior NCO	27	27	45	
	War. Off.	5	35	60	
	Officer	0	50	50	
Combat	Enlisted	25	13	62	.00
	Junior NCO	8	21	71	
	Senior NCO	10	10	80	
	War. Off.	0	32	68	
	Officer	3	12	85	

Table D-2-5 indicates that both in garrison and combat, for mission-related items, senior NCO's and enlisted men have higher expectations of adverse consequences from discovery of their use of irregular logistic procedures than junior NCO's, officers, and warrant officers. In combat, for items of no benefit to mission accomplishment, senior NCO's expect less severe consequences of discovery to a much greater degree than any other group.

TABLE D-2-5 When individuals in your position use irregular logistic procedures without being told to do by their military superiors, and their military superiors find out, what would you expect the superiors to do in most cases?						
Purpose of Procedures	Condition	Rank	Punish or Reprimand Them	Ignore the Act	Condone or Praise the Act	Conf. Level
Obtain Items Necessary to Mission Accomplishment	Garrison	Enlisted	36%	53%	11%	.01
		Junior NCO	21	66%	13%	
		Senior NCO	45	45%	10%	
		War. Off.	10	60%	30%	
		Officer	19	66%	15%	
	Combat	Enlisted	19	64%	18%	.00
		Junior NCO	10	57%	33%	
		Senior NCO	15	50%	35%	
		War. Off.	5	39%	56%	
		Officer	0	51%	49%	
Obtain Items Potentially Contributing to Mission Accomplishment	Garrison	Enlisted	41	49%	10%	.01
		Junior NCO	28	64%	7%	
		Senior NCO	55	45%	0	
		War. Off.	10	75%	15%	
		Officer	19	73%	7%	
	Combat	Enlisted	26	64%	11%	.00
		Junior NCO	11	75%	13%	
		Senior NCO	15	70%	15%	
		War. Off.	6	72%	22%	
		Officer	7	66%	27%	
Unrelated to Unit Mission	Combat	Enlisted	55	43%	1%	.01
		Junior NCO	50	47%	3%	
		Senior NCO	27	70%	3%	
		War. Off.	44	50%	6%	
		Officer	39	55%	2%	

Table D-2-6 reflects the impact of specific procedures on overall unit effectiveness. It suggest that:

- Procedures generally perceived less frequently as harmful and more frequently as helpful by enlisted men (E1-4) in garrison include:
 - Taking items without authority
 - Unauthorized cannibalization
 - Theft of military items (warrant officers felt similarly).
- Procedures generally perceived less frequently as helpful/more frequently as harmful by officers and warrant officers include:
 - Use of unauthorized maintenance procedures, including unauthorized levels of maintenance
 - Obtaining items or services from unauthorized sources
 - Use of personnel for unauthorized purposes
 - Use of gifts or favors to facilitate irregular procedures.

In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures?

Type of Procedure	Condition	Rank	Harmful Impact*	Helpful Impact*	Neutral	Conf. Level
Taking items without authority	Garrison	Enlisted	65%	15%	20%	.04
		Junior NCO	79	12	9	
		Senior NCO	83	13	4	
		War. Off.	75	15	10	
		Officer	83	15	2	
Unauthorized cannibalization	Garrison	Enlisted	69	20	11	.01
		Junior NCO	78	13	9	
		Senior NCO	85	13	5	
		War. Off.	85	5	10	
		Officer	90	5	5	
Theft of military items	Garrison	Enlisted	78	7	15	.00
		Junior NCO	91	2	7	
		Senior NCO	92	3	5	
		War. Off.	80	10	10	
		Officer	100	0	0	
Use of unauthorized maintain. procedures, including unauthorized levels of maintenance.	Garrison	Enlisted	64	14	22	.03
		Junior NCO	68	19	13	
		Senior NCO	67	13	20	
		War. Off.	30	40	30	
		Officer	52	28	20	
	Combat	Enlisted	46	28	26	.00
		Junior NCO	52	40	8	
		Senior NCO	38	59	3	
		War. Off.	20	75	5	
		Officer	30	65	5	
Obtaining items or services from unauthorized sources	Garrison	Enlisted	55	18	27	.00
		Junior NCO	43	29	28	
		Senior NCO	60	38	2	
		War. Off.	15	50	35	
		Officer	27	54	19	
	Combat	Enlisted	44	40	15	.00
		Junior NCO	29	49	22	
		Senior NCO	20	70	10	
		War. Off.	5	65	30	
		Officer	15	78	7	

*Harmful includes the responses "Harmful" and "Very harmful;" helpful includes the responses "Helpful" and "Very helpful."

TABLE D-2-6 In your opinion, what is the net result in terms of unit effective-
(cont.) ness of using each of the following irregular logistic procedures?

Type of Procedure	Condition	Rank	Harmful Impact*	Helpful Impact*	Neutral	Conf. Level
Use of personnel for unauthorized purposes	Garrison	Enlisted	61%	8%	31%	.00
		Junior NCO	65	13	22	
		Senior NCO	75	20	5	
		War. Off.	35	35	30	
		Officer	52	33	15	
=====						
Use of gifts or favors, such as liquor rations, to facilitate irregu- lar procedures.	Combat	Enlisted	50	30	20	.03
		Junior NCO	51	33	16	
		Senior NCO	44	48	8	
		War. Off.	40	60	--	
		Officer	32	56	12	

2.2 THE MOTIVATIONAL CONTEXT

Significant differences between the ranks on questions concerning motivations and incentives of personnel were found primarily in three areas:

- Work group norms under garrison conditions;
- Incentives affecting the use of irregular logistic procedures when desired items are not authorized by the logistic system; and
- Incentives affecting the use of irregular logistic procedures when desired items are both authorized but unavailable through prescribed logistic procedures.

2.2.1 Group Norms As noted in Section 3 and illustrated in Table D-2-7, officers and NCO's, but particularly NCO's were found to be significantly more likely than other ranks to report on balance that their work groups encourage the so-called duty norms, while officers and warrant officers were the least likely to report that their work groups encourage avoidance of work. Officers, warrant officers, and senior NCO's also reflected group norms more supportive of compliance with the wishes of superiors, liked and respected or not. Officers and warrant officers reflect more frequent group norms supporting the use of irregular logistic procedures to ensure mission accomplishment (under both garrison and combat conditions) and to get the job done faster (under garrison conditions only); senior NCO's joined them in this, but under combat conditions only.

2.2.2 Individual Incentives As illustrated by an examination of Table D-2-8, officers and warrant officers differ from enlisted personnel in a more consistent belief that the use of irregular logistic procedures to obtain authorized items and services that are not immediately available is motivated by duty-oriented incentives. In every instance at least 80% of both officers and warrant officers reported that these duty-oriented incentives encouraged the use of irregular logistic procedures. Enlisted personnel showed much less agreement. Like results occur for other positively oriented incentives.

Table D-2-7. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the following.

Group Norm	Condition	Rank	% Stating Groups Encourage*	% Stating Groups Discourage*	% Stating Groups Are Neutral	Conf. Level
A high skill level on the job	Garrison	Enlisted	77%	6%	17%	.04
		Junior NCO	82	2	16	
		Senior NCO	90	2	8	
		War. Off.	85	0	15	
		Officer	90	3	7	
=====						
High sense of motivation and esprit	Garrison	Enlisted	61	11	28	.01
		Junior NCO	73	6	21	
		Senior NCO	92	3	5	
		War. Off.	70	15	10	
		Officer	63	5	32	
=====						
High sense of duty	Garrison	Enlisted	63	10	27	.02
		Junior NCO	74	7	19	
		Senior NCO	90	0	10	
		War. Off.	65	5	30	
		Officer	68	5	27	
=====						
Giving top priority to flight safety	Garrison	Enlisted	77	9	14	.02
		Junior NCO	90	0	10	
		Senior NCO	87	3	10	
		War. Off.	85	5	10	
		Officer	93	2	5	
=====						
Avoidance of work	Garrison	Enlisted	27	51	23	.00
		Junior NCO	19	59	22	
		Senior NCO	13	77	10	
		War. Off.	0	80	20	
		Officer	5	66	29	
=====						
Compliance with wishes of well-liked superiors	Garrison	Enlisted	75	9	16	.00
		Junior NCO	79	5	16	
		Senior NCO	87	3	10	
		War. Off.	95	0	5	
		Officer	97	0	3	
=====						
Compliance with wishes of strongly disliked superiors	Garrison	Enlisted	28	35	37	.01
		Junior NCO	25	43	32	
		Senior NCO	47	24	39	
		War. Off.	58	16	26	
		Officer	40	25	35	

(continued)

Table D-2-8. Indicate how much influence you think each of the reasons given below has in deciding whether to use irregular or prescribed procedures in a given demand situation.					
Type of Incentive	Nature of Demand	Rank	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not An Influence Level
Desire to please superiors	Authorized but unavailable	Enlisted	43%	13%	44%
		Junior NCO	55	7	38
		Senior NCO	55	8	37
		War. Off.	70	0	30
	Unauthorized	Officer	93	0	5
		Enlisted	56	16	28
		Junior NCO	56	9	35
		Senior NCO	55	16	29
Desire to demonstrate initiative	Authorized but unavailable	War. Off.	75	10	15
		Officer	92	5	2
	Unauthorized	Enlisted	51	6	43
		Junior NCO	62	3	35
		Senior NCO	66	8	26
		War. Off.	100	0	0
	Authorized but unavailable	Officer	90	0	10
		Enlisted	53	13	34
Help others do their job	Authorized but unavailable	Junior NCO	63	2	35
		Senior NCO	55	5	40
		War. Off.	95	0	5
		Officer	85	3	12
	Unauthorized	Enlisted	32	11	57
		Junior NCO	26	23	51
		Senior NCO	21	18	61
		War. Off.	10	30	60
Personal gain of others	Authorized but unavailable	Officer	20	12	68
		Enlisted	32	11	57
		Junior NCO	26	23	51
		Senior NCO	21	18	61
	Unauthorized	War. Off.	10	30	60
		Officer	20	12	68
		Enlisted	32	11	57
		Junior NCO	26	23	51

(continued)

*Influence to use irregular procedures includes the responses "Strong influence to use" and "Some influence to use;" a similar combination is included under "Influence to use prescribed procedures."

Table D-2-8. Indicate how much influence you think each of the reasons given below has in deciding (cont.) whether to use irregular procedures or prescribed procedures in a given demand situation.

Incentive Type	Nature of Demand	Rank	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not an Influence	Confidence Level
Maintain safety standards	Authorized but unavailable	Enlisted	48%	23%	28%	.02
		Junior NCO	53	15	32	
		Senior NCO	47	16	37	
		War. Off. Officer	70	5	25	
	Unauthorized	Enlisted	71	10	19	.02
		Junior NCO	54	20	26	
		Senior NCO	61	13	26	
		War. Off. Officer	47	29	24	
Desire to demonstrate competence	Authorized but unavailable	War. Off. Officer	65	15	20	.01
			73	10	17	
		Enlisted	57	12	30	
		Junior NCO	59	6	35	
	Unauthorized	Senior NCO	60	8	32	.01
		War. Off. Officer	85	0	15	
			90	3	7	
		Enlisted	52	10	38	
	Unauthorized	Junior NCO	65	6	29	.01
		Senior NCO	63	8	29	
		War. Off. Officer	90	0	10	
			92	0	8	
To improve or maintain the unit's reputation	Authorized but unavailable	Enlisted	56	13	31	.01
		Junior NCO	58	12	29	
		Senior NCO	61	5	34	
		War. Off. Officer	80	5	15	
	Unauthorized	Enlisted	87	0	13	.04
		Junior NCO	52	12	35	
		Senior NCO	54	12	33	
		War. Off. Officer	60	11	29	
	Unauthorized	War. Off. Officer	80	5	15	.04
			90	5	5	

Table D-2-8 Indicate how much influence you think each of the reasons given below has in deciding (cont.) whether to use irregular procedures or prescribed procedures in a given demand situation.

Incentive Type	Nature of Demand	Rank	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not an Influence	Confidence Level
Importance of Task	Authorized but unavailable	Enlisted	67%	11%	22%	.01
		Junior NCO	86	2	12	
		Senior NCO	84	5	11	
		War. Off. Officer	95	0	5	
	Unauthorized	Enlisted	54	17	29	.02
		Junior NCO	76	7	17	
		Senior NCO	66	5	29	
		War. Off. Officer	85	0	15	
Sense of duty	Authorized but unavailable	Enlisted	88	2	10	.00
		Junior NCO	43	11	46	
		Senior NCO	56	12	32	
		War. Off. Officer	71	8	21	
	Unauthorized	Enlisted	80	0	20	.00
		Junior NCO	93	0	7	
		Senior NCO	42	14	44	
		War. Off. Officer	43	9	48	
To accomplish unit mission	Authorized but unavailable	Enlisted	58	13	29	.00
		Junior NCO	85	0	15	
		Senior NCO	95	2	3	
		War. Off. Officer	75	11	14	
	Unauthorized	Enlisted	79	7	14	.00
		Junior NCO	84	11	5	
		Senior NCO	90	10	0	
		War. Off. Officer	98	0	2	
To accomplish unit mission	Authorized but unavailable	Enlisted	75	16	9	.00
		Junior NCO	77	5	18	
		Senior NCO	74	10	16	
		War. Off. Officer	85	5	10	
	Unauthorized	Enlisted	98	0	2	.00
		Junior NCO	75	16	9	
		Senior NCO	77	5	18	
		War. Off. Officer	74	10	16	

When items are not authorized (i.e., are "illegitimate"), Table D-2-8 indicates that the officers and warrant officers again showed a high degree of consensus that very positive incentives such as as the desire to demonstrate competence, to improve the units' reputation, and to accomplish the unit mission encourage the use of irregular logistic procedures. There was much less agreement on this among the enlisted personnel. Officers, warrant officers, and senior NCO's were significantly less likely than the lower ranks to report that the personal gain of others encouraged the use of irregular logistic procedures to obtain unauthorized items.

When items are perceived as legitimate (authorized) and available through prescribed procedures, differences emerge between the ranks on the perceived impact of only two specific incentives. As indicated in Table D-2-9, officers are more likely to perceive avoidance of paperwork and the desire to acquire a reputation as an effective scrounger as influences favoring the use of irregular logistic procedures than lower ranking personnel.

3.0 DIFFERENCES BETWEEN CAREER FIELDS

Out of 201 relevant questions, significant differences between personnel divided by career field--command, maintenance, supply--were observed on only 21 responses (10.5%). The majority of these differences relate to perceptions of the military logistic situation.

3.1 SITUATIONAL CONTEXT

As illustrated in Table D-3-1, the majority of all personnel in both maintenance and supply report that they seldom or never have difficulty in determining what is authorized or not authorized; command personnel tend to report that they sometimes have such difficulty for items necessary to mission accomplishment under combat conditions. This is supported by the responses in Table D-3-2, in which only 25% of command personnel reported that they seldom or never experienced a refusal to authorize mission-related items under garrison conditions. At the same time, by a significant margin, more maintenance personnel reported frequent difficulty in determining authorization status for all types of items than members of other career fields; this is illustrated in Table D-3-1.

Table D-3-3 indicates that a near-majority of supply personnel (48%) believe that the logistic system is frequently unable to furnish authorized items unrelated to mission accomplishment under combat conditions; the majority of respondents in other career fields (53%) disagree. There was no significant difference between the career fields on the capability of the logistic system to supply authorized items in garrison, or mission-related items in combat.

Although at least half of all personnel in all three career fields believe that the use of irregular logistic procedures is often or always justified in combat when the logistic supply cannot provide authorized mission-related items, Table D-3-4 indicates that maintenance personnel are least likely to believe the use of such procedures are justified and command personnel are most likely to believe the use of

such procedures are justified. A possible explanation for this is that maintenance personnel are more concerned about the possible adverse effects of such procedures as jury-rigging of operating systems, etc. on maintenance quality, and prefer to delay mission accomplishment until necessary items and services can be supplied.

Perceptions of the impact of specific irregular logistic procedures did not differ significantly between the career groups in most cases. As indicated in Table D-3-5, supply predictably indicated greater opposition to unauthorized stockpiling in both garrison and combat than other career fields, because the use of such procedure directly and adversely affects their application to control stockage levels and verify use rates for items. Under garrison conditions, command personnel were unanimous in believing that theft is harmful (unlike other career fields), and, under combat conditions, command personnel were more supportive of unauthorized exchanges or use of items than other personnel.

Table D-3-6 indicates that a majority of supply personnel believe that the task of obtaining supplies under garrison conditions can be performed adequately without the use of irregular logistic procedures; a majority of maintenance and command personnel disagree.

In terms of the anticipated response from superiors following the discovery of the use of irregular logistic procedures, Table D-3-7 illustrates that a considerable minority (30%) of command personnel expect to be praised when such procedures are related to mission accomplishment and are performed under combat conditions. The percentage of maintenance and supply personnel expecting praise under these circumstances was considerably smaller. The majority of all personnel in all three career fields expected the use of irregular logistic procedures under these circumstances to be ignored or condoned.

Table D-3-1 Without asking your source of supply, how often do you have difficulty in telling the difference between what is and what is not considered authorized by the logistic system for the following types of items?

Type of Item	Condition	Career Group	Seldom or Never	Some-times	Often or Always	Conf. Level
Necessary to mission accomplishment	Garrison	Maintenance	53%	29%	18%	.02
		Supply	62	27	11	
		Command	30	55	15	
Unrelated to mission accomplishment	Garrison	Maintenance	53	22	25	.05
		Supply	66	17	17	
		Command	60	35	5	
	Combat	Maintenance	52	24	24	.01
		Supply	67	23	10	
		Command	70	25	5	

Table D-3-2 In your experience, has the logistic system for any reason refused to authorize for issue or requisition by you, your buddies, or your unit, any items of the following types?

Nature of Item	Condition	Career Group	Never or Seldom	Some-times	Often or Always	Conf. Level
Necessary to Mission Accompl.	Garrison	Maintenance	50%	37%	13%	.05
		Supply	52	37	11	
		Command	25	40	35	
Potential Contribution to Mission	Garrison	Maintenance	39	42	19	.04
		Supply	26	51	13	
		Command	10	55	45	

Table D-3-3 How frequently, under combat conditions, has the logistic system been <u>unable</u> to furnish authorized items unrelated to mission accomplishment?				
Career Group	Less than one-fourth the time	One-fourth to one-half the time	More than one-half the time	Conf. Level
Maintenance	53%	17%	30%	.02
Supply	31	21	48	
Command	53	16	31	

Table D-3-4 Under combat conditions, suppose that a desired item or service is authorized by the logistic system but not immediately available. How often would you consider use of irregular logistic procedures to be justified for each of the following types of items?					
Nature of Item	Career Group	Never or Seldom	Sometimes	Often or Always	Confidence Level
Necessary to Mission Ac-	Maintenance	11%	18%	71%	.05
	Supply	11	6	83	
	Command	5	10	85	
Potential Contribution to Mission	Maintenance	14	36	50	.04
	Supply	12	23	65	
	Command	10	20	70	

Table D-3-5 In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures?

Type of Procedure	Condition	Career Grp.	Harmful Impact*	Helpful Impact*	Neutral	Confid. Level
Unauthorized stockpiling	Garrison	Maintenance	35%	50%	15	.01
		Supply Command	50	31	19	
	Combat	Maintenance	30	65	5	
		Supply Command	18	73	9	
Theft of military items	Garrison	Maintenance	40	49	11	.00
		Supply Command	10	75	15	
	Garrison	Maintenance	89	4	7	.03
		Supply Command	79	6	15	
Unauthorized exchanges or use of items	Combat	Maintenance	100	0	0	.02
		Supply Command	36	43	21	
	Combat	Maintenance	35	46	19	
		Supply Command	20	75	5	

*The category "Harmful Impact" includes the responses "Very harmful" and "Harmful;" the category "Helpful Impact" includes the responses "Very helpful" and "Helpful."

Table D-3-6 Under garrison conditions, if individuals in your current position never used any irregular logistic procedures, how well could they obtain necessary parts and supplies for weapons and operating systems?

<u>Career Group</u>	<u>Poorly or Not at All</u>	<u>Adequately or Very Well</u>	<u>Confidence Level</u>
Maintenance	60%	40%	.02
Supply	43	57	
Command	65	35	

Table D-3-7 When individuals in your position use irregular logistic procedures under combat conditions without being told to do so by their military superiors and their military superiors find out, what would you expect the superiors to do in most cases (when the procedures are used to obtain an item or service potentially contributing to mission accomplishment)?

<u>Career Group</u>	<u>Punish or Reprimand Them</u>	<u>Ignore The Act</u>	<u>Condone the Act or Praise Them</u>	<u>Conf. Level</u>
Maintenance	16%	71%	13%	.05
Supply	14	67	19	
Command	10	60	30	

Table D-2-9. Indicate how much influence you think each of the reasons given below has in deciding whether to use irregular procedures or prescribed procedures when desired items are authorized and available through prescribed procedures.					
<u>Incentive Type</u>	<u>Rank</u>	<u>Influence To Use Irregular Procedures*</u>	<u>Influence To Use Prescribed Procedures*</u>	<u>Not An Influence</u>	<u>Conf. Level</u>
Avoid paperwork	Enlisted	41%	21%	38%	.01
	Junior NCO	47	20	33	
	Senior NCO	59	5	36	
	War. Off.	65	0	35	
	Officer	71	5	24	
=====					
Desire to gain a reputation as a scrounger	Enlisted	26	18	56	.01
	Junior NCO	38	11	51	
	Senior NCO	38	0	62	
	War. Off.	40	10	50	
	Officer	59	2	39	

*Influence To Use Irregular Procedures includes the responses "Some Influence" and "Strong Influence"; a similar combination of responses comprises the category Influence To Use Prescribed Procedures.

3.2 MOTIVATIONAL CONTEXT

As illustrated in Table D-3-8, personnel in the supply career field were significantly more likely to report that their work groups encouraged the norm of avoidance of work than personnel in maintenance and command. Command personnel differ from both maintenance and supply personnel in reporting by a better than a two-to-one margin that their work groups actively encourage compliance with the wishes of superiors who have not earned respect (under both garrison and combat conditions), and encourage the fostering of group welfare (under garrison conditions).

Although a minimal number of apparent differences between career fields were reported on questions relating to the perception of individual incentives, it is believed that these few differences are due to the high percentage of officers included in the command career field sample.

Table D-3-8. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the following.

Group Norm	Condition	Career Field	% Stating Groups Encourage*	% Stating Groups Discourage*	% Stating Groups Are Neutral	Conf. Level
Avoidance of work	Garrison	Maintenance	13%	68%	19%	.00
		Supply	34	45	21	
		Command	0	60	40	
	Combat	Maintenance	8	90	2	.00
		Supply	40	50	10	
		Command	15	69	15	
=====						
Compliance with wishes of superiors who have not earned respect	Garrison	Maintenance	32	31	37	.01
		Supply	34	33	33	
		Command	70	0	30	
	Combat	Maintenance	38	28	33	.03
		Supply	30	20	40	
		Command	69	0	31	
=====						
Fostering of group welfare	Garrison	Maintenance	59	7	34	.05
		Supply	58	4	38	
		Command	79	0	21	

*Encourage includes the responses "Encourage a lot" and "Encourage somewhat"; discourage includes the responses "Discourage a lot" and "Discourage somewhat."

4.0 DIFFERENCES BETWEEN WORK GROUPS (UNITS)

The survey sample was taken from members of seven military units each of which may be viewed as a separate work group for the purposes of this study. These work groups may be defined briefly as follows:

Work Groups A, B, D and E	- Operational units
Work Groups C and F	- Supply units
Work Group G	- Headquarters Aviation Management personnel

Contrary to sociological theory emphasizing the importance of primary units in shaping military attitudes and norms, relatively few differences were observed among the attitudes of members of the seven work groups. Only 30 of the 201 questions (15%) resulted in statistically significant variation between work groups. Half of these differences related to the perception of the potential military logistic situation.

4.1 THE SITUATIONAL CONTEXT

Unusual diversity exists among groups in response to the general theme of what circumstances give rise to unsatisfied demand which may lead to use of irregular logistic procedures. Some of this variation may be due to inter-Service differences,¹ but most appear to be idiosyncratic to particular work groups.

With respect to maintenance short-cuts, Table D-4-3 illustrates that Work Group D, consisting of headquarters aviation management personnel, differed significantly from other work groups in tending to deny that short cuts can make helicopter maintenance under combat conditions faster or easier without reducing the quality of the results. The four operational units--Work Groups A,B,D, and F--tended to be more supportive of the use of such short-cuts under combat conditions than the other work groups.

¹See Section 7 of Appendix F.

Table D-4-1 If individuals in your current position never used <u>any</u> irregular logistic procedures, how well could they perform the following tasks?					
Task	Condition	Work Group	Poorly or Not at All	Adequately or Very Well	Conf. Level
Obtain parts and supplies for weapons or operating systems	Combat	A	56%	44%	.01
		B	84	16	
		C	42	58	
		D	70	30	
		E	86	14	
		F	79	21	
		G	71	29	
Perform maintenance on weapons and operating systems	Garrison	A	39	61	.03
		B	47	53	
		C	15	85	
		D	37	63	
		E	70	30	
		F	46	54	
		G	44	56	

Table D-4-2 Suppose that an item or service is authorized by the logistic system but not available in time. How often would you consider your use of irregular logistic procedures to be justified for the following types of items?

Nature of Item	Condition	Work Group	Seldom or Never	Sometimes	Often or Always	Conf. Level
Necessary for Mission Accomplishment	Garrison	A	28%	31%	41%	.01
		B	15	9	76	
		C	20	25	55	
		D	9	34	57	
		E	16	19	65	
		F	3	15	82	
		G	17	34	49	
	Combat	A	37	43	20	.00
		B	18	50	32	
		C	30	60	10	
		D	17	40	43	
		E	13	38	49	
		F	10	44	46	
		G	24	49	27	
Potentially Contributing to Mission Accomplishment	Garrison	A	16	34	50	.00
		B	3	6	91	
		C	11	6	83	
		D	6	17	77	
		E	11	3	86	
		F	3	8	89	
		G	21	21	57	
	Combat	A	26	44	30	.00
		B	6	34	59	
		C	17	33	50	
		D	9	37	54	
		E	16	14	70	
		F	5	27	68	
		G	14	35	51	

Table D-4-3 How frequently can unauthorized short cuts be used to make helicopter maintenance under combat conditions faster or easier without reducing the quality of the results?

<u>Work Group</u>	<u>Never or Seldom</u>	<u>Sometimes</u>	<u>Often or Always</u>	<u>Confidence Level</u>
A	15%	36%	49%	.05
B	10	27	63	
C	28	61	11	
D	26	26	47	
E	24	16	59	
F	23	37	39	
G	46	19	35	

Table D-4-4 shows that work groups, in both garrison and combat, hold differing views with respect to the frequency of authorization refusal. Some influence is indicated for inter-Service differences, but much of the variation appears to be idiosyncratic rather than related to the work group unit function.

Table D-4-4 In your experience, has the logistic system for any reason refused to authorize for issue or requisition by you, your buddies, or your unit, any items which you believed were of the following types?						
Nature of Item	Condition	Work Group	Seldom or Never	Some-times	Often or Always	Confid. Level
Necessary to Mission Accomplishment	Garrison	A	70%	24%	6%	.00
		B	53	32	15	
		C	74	26	0	
		D	43	34	23	
		E	41	43	16	
		F	28	49	23	
		G	39	46	15	
	Combat	A	80	11	9	.00
		B	62	34	3	
		C	89	11	0	
		D	56	26	18	
		E	53	28	19	
		F	50	28	22	
		G	56	22	22	
Potentially Contributing to Mission Accomplishment	Garrison	A	52	37	11	.03
		B	32	53	15	
		C	40	55	5	
		D	37	40	23	
		E	24	41	35	
		F	28	54	18	
		G	34	42	24	
	Combat	A	70	18	12	.02
		B	44	53	3	
		C	61	39	0	
		D	44	41	15	
		E	33	33	33	
		F	44	31	25	
		G	50	22	28	

Table D-4-5 shows that, among work groups, one operational unit (Work Group E) differed significantly from the others in indicating a markedly stronger influence of individuals outside the chain of command and personal initiative in initiating irregular logistic procedures under combat conditions. A second operational unit (Work Group A) displayed significantly less influence of individuals outside the chain of command in initiating such procedures. These differences appear to be idiosyncratic to the specific work groups, and not related to the work group's function or Service.

Table D-4-5 When an individual in your position uses irregular logistic procedures under combat conditions, how often will it be in response to requests from individuals outside the chain of command? How often will it be on their own initiative?					
Instigator	Work Group	Never or Seldom	Sometimes	Often or Always	Confidence Level
Other Individual	A	58%	28%	14%	.00
	B	25	47	28	
	C	47	42	11	
	D	38	38	24	
	E	22	36	42	
	F	44	33	22	
	G	37	42	21	
Personal Initiative	A	28	40	31	.03
	B	9	50	41	
	C	37	37	26	
	D	11	41	47	
	E	8	31	61	
	F	14	36	50	
	G	32	21	47	

Table D-4-6 displays considerable, apparently idiosyncratic differences among work groups with respect to the likelihood of discovery (by a superior) of the use of irregular logistic procedures used to obtain mission-related items. The variation in the expected consequences of such discovery, displayed in Table D-4-7, also appear to be idiosyncratic to the specific work groups rather than related to work group function or service.

Table D-4-6 When individuals in your position use irregular logistic procedures without being told to so by their military superiors, how often do their superiors find out that such procedures have been used, under garrison conditions, for the following types items?					
<u>Nature of Item</u>	<u>Work Group</u>	<u>Seldom or Never</u>	<u>Sometimes</u>	<u>Often or Always</u>	<u>Confidence Level</u>
Necessary to Mission Accomplishment	A	41%	26%	33%	.03
	B	15	26	59	
	C	30	40	30	
	D	31	23	46	
	E	30	35	35	
	F	33	33	43	
	G	44	37	19	
=====					
Potentially Contributing to Mission Accomplishment	A	44	39	17	.02
	B	21	38	41	
	C	50	40	10	
	D	20	46	34	
	E	30	35	35	
	F	41	31	28	
	G	36	44	20	

Table D-4-7 When individuals in your position use irregular logistic procedures without being told to so by their military superiors and their superiors find out, what would you expect the superiors to do in most cases when the procedures are used to obtain an item or service necessary to mission accomplishment?					
Condition	Work Group	Punish or Reprimand Them	Ignore or Condone the Act	Praise the Act	Confidence Level
Garrison	A	43%	35%	22%	.00
	B	9	50	41	
	C	25	35	40	
	D	28	29	43	
	E	32	27	41	
	F	8	28	64	
	G	44	15	41	
Combat	A	16	39	45 45	.01
	B	3	25	72 72	
	C	11	44	44 44	
	D	17	23	60 60	
	E	11	22	67 67	
	F	3	19	78 78	
	G	17	36	47 47	

With respect to perceptions of the utility of obtaining items or services from unauthorized sources under garrison conditions (Table D-4-8), the observed variation between work groups is believed to result from inter-Service differences. The same can be said for variation on the perceived utility of unauthorized fabrication of parts under combat conditions, illustrated in Table D-4-9. Also indicated in Table D-4-9 is the difference between Work Group C, a supply unit, and all other work groups on the perceived utility of three other irregular logistic procedures under combat conditions. For unauthorized stockpiling, unauthorized maintenance procedures, and the use of gifts or favors, Group C personnel were significantly more likely to view the procedure as harmful to unit effectiveness than other respondents.

Table D-4-8 In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures under garrison conditions?

Type of Procedure	Work Group	Harmful	Helpful	Neutral	Confid. Level
Obtaining item or services from unauthorized sources	A	59%	14%	27%	.02
	B	44	35	21	
	C	55	20	25	
	D	50	31	29	
	E	37	42	11	
	F	20	46	33	
	G	43	34	15	

Table D-4-9 In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures under combat conditions?

Type of Procedure	Work Group	Harmful	Helpful	Neutral	Confid. Level
Unauthorized stockpiling	A	21%	69%	10%	.03
	B	25	72	3	
	C	47	37	16	
	D	15	73	12	
	E	16	70	14	
	F	16	79	5	
	G	22	67	11	
=====					
Unauthorized fabrication of parts	A	33	40	17	.03
	B	16	69	15	
	C	26	42	32	
	D	41	39	20	
	E	41	46	13	
	F	42	45	13	
	G	55	34	11	
=====					
Use of unauthorized maintenance procedures incl. unauthorized level of maintenance	A	49	22	29	.02
	B	37	59	3	
	C	58	26	16	
	D	38	47	15	
	E	42	58	0	
	F	24	65	11	
	G	47	42	11	
=====					
Use of gifts or favors, such as liquor rations to facilitate irregular procedures	A	58	22	19	.01
	B	50	9	41	
	C	74	5	21	
	D	32	30	38	
	E	35	3	62	
	F	29	16	55	
	G	49	5	46	

4.2 THE MOTIVATIONAL CONTEXT

Significant differences between the work groups on the motivational context of irregular logistic procedures are relatively few in number and appear, in most cases, to be idiosyncratic. As indicated in Table D-4-10, the principal exception to this is the significantly greater support given to avoidance of work, and to the use of irregular logistic procedures for group prestige and welfare purposes, by Work Group G, the headquarters aviation management element. Another exception, less susceptible to analytical interpretation, is the similarity between Work Groups B and F (an operational unit and a supply unit of different services, respectively) in terms of the perceived impact of incentives when desired items are not authorized by the logistic system. As illustrated in Table D-4-11, in each case where a difference was observed between the work groups on this type of question, members of Groups B and F were consistently more likely than the members of other groups to perceive incentives as encouraging the use of irregular logistic procedures.

Table D-4-10 Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the following (under garrison conditions).

garrison conditions).					
Group Norm	Work Group (Unit)	% Stating Groups Encourage*	% Stating Groups Discourage*	% Stating Groups Are Neutral	Conf. Level
Avoidance of work	A	4%	87%	9%	.00
	B	9	68	23	
	C	20	50	30	
	D	29	37	34	
	E	16	62	22	
	F	3	69	28	
	G	37	52	10	
=====					
Use of irregular procedures to improve work group prestige	A	29	39	32	.01
	B	47	26	26	
	C	30	30	40	
	D	48	26	26	
	E	57	13	30	
	F	51	8	41	
	G	68	20	12	
=====					
Use of irregular procedures to improve group living conditions	A	29	30	41	.02
	B	50	18	32	
	C	30	35	35	
	D	60	23	17	
	E	49	11	40	
	F	41	13	46	
	G	68	17	15	

*Encourage includes the responses "Encourage a lot" and "Encourage somewhat"; discourage includes the responses "Discourage a lot" and "Discourage somewhat."

Table D-4-11 Indicate how much influence you think each of the reasons given below has in deciding whether to use irregular or prescribed procedures in a given demand situation.

Incentive Type	Nature of Demand	Work Group	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not An Influence	Confidence Level
Compliance with direct orders of a superior	Authorized but unavailable	A	65%	13%	22%	.02
		B	67	6	27	
		C	67	16	16	
		D	48	23	28	
		E	58	18	24	
		F	85	5	10	
		G	45	24	31	
	Unauthorized	A	73	7	20	.01
		B	91	0	9	
		C	67	5	28	
		D	60	14	26	
		E	63	8	29	
		F	82	5	13	
		G	52	20	27	
=====						
Help others do their jobs	Unauthorized	A	61	35	4	.05
		B	73	0	27	
		C	61	6	33	
		D	66	11	23	
		E	68	5	26	
		F	76	3	21	
		G	49	23	28	

Table D-4-1) Indicate how much influence you think each of the reasons given below has in deciding (contd.) whether to use irregular or prescribed procedures in a given demand situation.

Incentive Type	Nature of Demand	Work Group	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not An Influence	Confidence Level
To accomplish the unit mission	Unauthorized	A	85%	4%	11%	
		B	94	0	6	
		C	78	5	17	
		D	66	8	26	.00
		E	71	11	18	
		F	95	2	2	
		G	72	10	17	
=====						
Importance of task	Unauthorized	A	73	7	20	
		B	91	0	9	
		C	67	5	28	
		D	60	14	26	.00
		E	63	8	29	
		F	82	5	13	
		G	52	20	27	
	Authorized and available	A	54	31	15	
		B	49	21	30	
		C	37	42	21	
		D	37	34	29	.04
		E	61	8	31	
		F	61	18	21	
		G	60	22	17	

5.0 DIFFERENCES BETWEEN PERSONNEL WITH/WITHOUT COMBAT EXPERIENCE

The survey respondents were asked to indicate whether or not they had combat experience. Since it is now almost five years since the last significant combat activity of the U.S. armed forces (i.e., since the evacuation of Southeast Asia), the combat veterans differed from survey respondents lacking combat experience in that they included no personnel below the rank of E-4 and, on the average, have been on active duty longer. In terms of the survey responses, combat veterans differed from personnel without combat experience on 33 out of 183 relevant questions (18%). Nearly half of these differences related to perceptions of the situational context for irregular logistic procedures under combat conditions; there were almost no statistically significant differences between combat and noncombat respondents on garrison conditions. A second major area of disagreement concerned work group norms under garrison conditions; combat veterans differed from personnel without combat experience on 11 out of 18 possible norms.

5.1 THE SITUATIONAL CONTEXT

As noted in Section 2.2.2 of the main text of this Report, and illustrated in Table D-5-1, personnel with combat experience are more likely to feel justified in using irregular logistic procedures under combat conditions for some types of authorized items than are personnel who have not experienced combat.

Combat veterans also have somewhat different perceptions of the role of the chain of command in the use of irregular logistic procedures under combat conditions. As indicated in Table D-5-2, personnel with combat experience are significantly more likely to ascribe the initiation of an irregular logistic procedure to military superiors and to personal initiative than personnel without combat experience. There is also a smaller, but still statistically significant, propensity to perceive individuals outside to chain of command as more likely to initiate the use of irregular logistic procedures.

Table D-5-1. Suppose that an item or service is authorized by the logistic system but not available in time. Under combat conditions, how often would you consider your use of irregular logistic procedures to be justified for the following type of item?

<u>Nature of Item</u>	<u>Type of Experience</u>	<u>Seldom or Never</u>	<u>Sometimes</u>	<u>Often or Always</u>	<u>Conf. Level</u>
Potentially Contributing to Mission Accomplishment	Noncombat Combat	14% 12	35% 27	51% 61	.05

Table D-5-2. When an individual in your position uses irregular logistic procedures, under combat conditions, how often will it be in response to military superiors? To requests from individuals outside the chain of command? To their own personal initiative?

<u>Instigator</u>	<u>Type of Experience</u>	<u>Never or Seldom</u>	<u>Sometimes</u>	<u>Often or Always</u>	<u>Confidence Level</u>
Direct Order	Noncombat Combat	21% 14	32% 25	47% 60	.02
Other Individual	Noncombat Combat	41 35	38 36	20 29	.04
Personal Initiative	Noncombat Combat	23 13	38 32	39 55	.01

Significantly, the combat veterans were much less likely than personnel without combat experience to report that they expected punishment or reprimand to result from their use of irregular logistic procedures under combat conditions. In fact, a significant minority of the combat veterans (40%) expected to be praised for their use of irregular procedures to obtain necessary items under combat conditions, compared to only 28% of the personnel without combat experience. These differences are illustrated in Table D-5-3.

As illustrated in Table D-5-4, personnel with combat experience were significantly more likely than personnel without combat experience to perceive a large variety of irregular logistic procedures as helpful to unit effectiveness under combat conditions. Specifically, a majority of the combat veterans viewed the use of unauthorized maintenance procedures, unauthorized fabrication of parts, obtaining items from unauthorized sources, and the use of gifts or favors as helpful; a majority of the personnel with noncombat experience only disagreed. This difference did not generally extend to garrison conditions; nevertheless, the combat veterans were also significantly more likely to perceive taking items without authority as helpful under garrison conditions than were personnel without combat experience.

Overall, the combat veterans tend to view the distinction between combat and garrison conditions as requiring different behavior relevant to logistics. Personnel without combat experience were less likely to view the difference between combat and garrison conditions as important for the decision to use irregular logistic procedures.

5.2 THE MOTIVATIONAL CONTEXT

As mentioned in Section 3.1 of the main text of this Report, and illustrated in Table D-5-5, combat veterans were significantly more likely than personnel with noncombat experience only to report that their work groups encourage norms consistent with service ethics under garrison conditions. They were also significantly more likely to report that their work groups encourage the use of irregular logistic procedures to improve group living conditions.

Table D-5-3. When individuals in your position use irregular logistic procedures under combat conditions without being told to do so by their military superiors and their superiors find out, what would you expect the superiors to do in most cases for each of the following types of items?

<u>Nature of Item</u>	<u>Type of Experience</u>	<u>Punish or Reprimand Them</u>	<u>Ignore the Act</u>	<u>Condone the Act or Praise Them</u>	<u>Conf. Level</u>
Necessary for Mission Accomplishment	Noncombat Combat	14% 6	32% 23	53% 71	.00
Potentially Contributing to Mission Accompl.	Noncombat Combat	19 8	44 26	37 66	.00
Unrelated to Unit Mission	Noncombat Combat	54 31	36 46	10 23	.00

Table D-5-4. In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures?

Type of Procedure	Condition	Type of Experience	Harmful	Helpful	Neutral	Conf. Level
Taking items without authority	Garrison	Noncombat Combat	77% 73	10% 20	12% 7	.05
Unauthorized cannibalization	Combat	Noncombat Combat	57 49	29 46	14 5	.02
Unauthorized stockpiling	Combat	Noncombat Combat	26 13	61 82	13 5	.00
Unauthorized fabrication of parts	Combat	Noncombat Combat	42 33	37 59	21 8	.01
Use of unauthorized maintenance procedures incl. unauthorized levels of maintenance	Combat	Noncombat Combat	44 35	40 59	16 6	.02
Unauthorized use of equipment with maintenance or other deficiency	Combat	Noncombat Combat	64 50	19 30	17 20	.01
Obtaining items from unauthorized sources	Combat	Noncombat Combat	33 18	49 69	18 13	.00
Use of personnel for unauthorized purposes	Combat	Noncombat Combat	46 38	29 46	25 16	.01
Use of authorized items or services for unauthorized purposes	Combat	Noncombat Combat	56 48	21 37	22 15	.02
Use of gifts or favors, such as liquor rations, to facilitate an irregular procedure	Combat	Noncombat Combat	49 37	35 53	16 10	.02

Table D-5-5. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the following under garrison conditions.*

Group Norm	Type of Experience	Encourage**	Discourage**	Neu- tral	Conf. Level
A high skill level on the job	Noncombat	80%	4%	16%	.01
	Combat	91	1	8	
A high sense of esprit and motivation	Noncombat	65	10	25	.00
	Combat	82	4	14	
Teamwork	Noncombat	75	7	17	.04
	Combat	85	0	15	
Fostering of group welfare	Noncombat	55	7	38	.00
	Combat	71	4	25	
A high sense of duty	Noncombat	68	8	24	.05
	Combat	78	4	18	
Giving top priority to flight safety	Noncombat	82	5	13	.01
	Combat	92	2	8	
Compliance with well-liked superiors	Noncombat	80	6	14	.00
	Combat	92	1	7	
Compliance with respected superiors	Noncombat	86	2	12	.03
	Combat	95	1	4	
Compliance with superiors who have not earned respect	Noncombat	33	31	36	.05
	Combat	41	24	35	
Following regulations without question at all times	Noncombat	54	15	31	.00
	Combat	74	8	18	
Use of irregular procedures to improve group living conditions	Noncombat	43	24	32	.05
	Combat	55	13	32	

*Only combat veterans were asked about work group norms under combat conditions.

**Encourage includes the responses "Encourage a lot" and "Encourage somewhat;" discourage includes the responses "Discourage a lot" and "Discourage somewhat."

Very few differences were reported between personnel with and without combat experience in terms of the perceived effect of specific incentives. As illustrated in Table D-5-6, when items are authorized and available, combat veterans are less likely to view three incentives as encouraging the use of irregular logistic procedures. In contrast, when items are not available, combat veterans are significantly more likely to perceive a sense of duty as encouraging the use of irregular procedures and personal gain as having no influence on the choice of procedures.

There are two possible explanations for the observed differences on motivational factors between personnel with combat experience and personnel lacking combat experience. On the one hand, the relatively longer period of service and the intensity of the combat experience may reinforce the socialization of combat veterans in favor of the adoption of service ethics, in which case the personnel with noncombat experience only will tend to change their perceptions after they have served longer and/or experience combat. On the other hand, it is possible that personnel who have undergone combat and not adopted service-oriented perceptions and attitudes have already left active duty. This latter explanation for the observed differences would imply that service under combat conditions does not necessarily reinforce socialization in favor of the adoption of service ethics.

6.0 DIFFERENCES BASED ON JOB SATISFACTION

Based on the answers to questions relating to satisfaction with pay, supervisors, promotion progress, etc., the survey respondents were divided into four categories relative to job satisfaction. These categories are:

- Dissatisfied with work environment (i.e., with supervisor, job, persons in the work group, etc.)
- Dissatisfied with career (i.e., with the service, pay, progress made in career advancement, etc.)
- Dissatisfied with aspects of both career and work environment
- Satisfied (i.e., with both work environment and career).

Table D-5-6. Indicate how much influence you think each of the reasons given below has in deciding whether to use irregular or prescribed procedures in a given demand situation.

Incentive Type	Nature of Demand	Type of Experience	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not An Influence	Conf. Level
Acquire items for own personal gain	Authorized but unavailable	Noncombat Combat	32% 16	13% 17	55% 67	.03
Sense of duty	Authorized but unavailable	Noncombat Combat	57 71	11 4	32 25	.01
	Authorized and available	Noncombat Combat	40 34	24 33	36 33	.02
Compliance with written logistic regulations	Authorized and available	Noncombat Combat	22 14	35 46	43 40	.05
Prepare for future needs for similar items	Authorized and available	Noncombat Combat	59 55	13 23	28 22	.04

The majority of all respondents (130, or 52% of the total) were satisfied with both their work environment and their careers in the service. Further, there were very few differences between satisfied and dissatisfied personnel on attitudes and perceptions directly related to irregular logistic procedures. Of the 201 questions, statistically significant differences between personnel grouped by job satisfaction appeared on only 23 responses (less than 12%). There were no differences between personnel divided in this way on questions relating to the impact of specific incentives; in other words, dissatisfied personnel were not significantly more likely to view such incentives as personal gain or the desire to "beat the System" as affecting their logistic decisions than were satisfied personnel.

The limited number of differences between personnel grouped by job satisfaction have proven to be difficult to interpret analytically. One reason for this is that it is impossible to determine whether dissatisfaction with the work environment, in particular, causes or results from different perceptions of work group norms and the military logistic situation. Thus, for example, when a relatively high percentage of dissatisfied personnel report that they often have difficulty telling the difference between what is and what is not considered an authorized item (see Table D-6-1), the analyst cannot be certain that they exhibit this difficulty because they are dissatisfied, or that they are dissatisfied because they have this difficulty.

The following tables provide all significant differences between personnel divided by job satisfaction, without an attempt at detailed analysis. It is suggested that additional research into the relationship between job satisfaction and the use of irregular logistic procedures may be useful, both for an improved understanding of the psychological aspects of military logistics and an enhanced knowledge of the impact of job dissatisfaction among personnel on the performance of military duties.

Table D-6-1. Without asking your source or supply, how often do you have difficulty in telling the difference between what is and what is not considered authorized by the logistic system for items you perceive as necessary to mission accomplishment?

Condition	Satisfaction with Work Environment and Career	Seldom or Never	Sometimes	Often or Always	Conf. Level
Combat	Dissatisfied with work environment	57%	13%	30%	.02
	Dissatisfied with career	49	27	24	
	Dissatisfied with aspects of both	50	23	26	
	Satisfied	62	19	19	

Table D-6-2. In your experience, has the logistic system for any reason refused to authorize for issue or requisition by you, your buddies, or your unit, any items which you believed to be necessary for mission accomplishment?

Condition	Satisfaction with Job and Career	Never or Seldom	Sometimes	Often or Always	Conf. Level
Garrison	Dissatisfied with work environment	57%	26%	16%	.02
	Dissatisfied with career	63	27	10	
	Dissatisfied with aspects of both	58	21	21	
	Satisfied	64	21	15	

Table D-6-3. Suppose that a desired item or service is not authorized by the logistic system. How often, under combat conditions, would you consider use of irregular logistic procedures to be justified for the following types of items?

<u>Nature of Item</u>	<u>Satisfaction with Work Environment and Career</u>	<u>Seldom or Never</u>	<u>Sometimes</u>	<u>Often or Always</u>	<u>Conf. Level</u>
Necessary to Mission	Dissatisfied with work environment	24%	31%	45%	.01
	Dissatisfied with career	10	14	76	
	Dissatisfied with aspects of both	6	23	70	
	Satisfied	10	11	79	
=====					
Not Related to Mission	Dissatisfied with work environment	70	13	17	.01
	Dissatisfied with career	56	34	10	
	Dissatisfied with aspects of both	38	38	24	
	Satisfied	69	21	9	

Table D-6-4. Suppose that an item or service is authorized by the logistic system but not available in time. Under combat conditions, how often would you consider your use of irregular logistic procedures to be justified for the following types of items?

Nature of Item	Satisfaction with Job and Career	Seldom or Never	Some- times	Often or Always	Confidence Level
Necessary to Mission Accomplishment	Dissatisfied with work environment	17%	20%	63%	
	Dissatisfied with career	8	13	79	.05
	Dissatisfied with aspects of both	9	6	85	
	Satisfied	10	16	74	
Potentially Con- tributing to Mission Accomplishment	Dissatisfied with work environment	21	31	48	
	Dissatisfied with career	13	31	56	.02
	Dissatisfied with aspects of both	6	24	70	
	Satisfied	13	35	52	
Unrelated to Unit Mission	Dissatisfied with work environment	83	10	7	
	Dissatisfied with career	65	25	10	.01
	Dissatisfied with aspects of both	47	35	18	
	Satisfied	64	25	11	

Table D-6-5. When individuals in your position use irregular logistic procedures without being told to do so by their military superiors and their military superiors find out, what would you expect the superiors to do in most cases, for the following types of items?

Nature of Item	Condition	Satisfaction with Job and Career	Punish or Reprimand	Ignore the Act	Condone the Act or Praise	Conf. Level
Necessary to Mission Accomplishment	Combat	Dissatisfied with work environment	20%	33%	47%	
		Dissatisfied with career	6	23	71	.03
		Dissatisfied with aspects of both	9	26	65	
		Satisfied	13	30	57	
=====						
Potentially Con- tributing to Mission Accomplishment	Combat	Dissatisfied with work environment	27	50	23	
		Dissatisfied with career	10	33	57	.03
		Dissatisfied with aspects of both	12	32	56	
		Satisfied	16	37	47	
=====						
Unrelated to Unit Mission	Garrison	Dissatisfied with work environment	55	32	13	
		Dissatisfied with career	59	28	13	.02
		Dissatisfied with aspects of both	63	31	6	
		Satisfied	76	19	5	

Table D-6-6. In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures?

Type of Procedure	Condition	Satisfaction with Job and Career	Harmful	Helpful	Neutral	Conf. Level
Intentionally sub- mitting incorrect documents to obtain items/services	Garrison	Dissatisfied with work environment	53%	20%	27%	
		Dissatisfied with career	62	13	25	
		Dissatisfied with aspects of both	71	17	11	.02
		Satisfied	73	13	13	
=====						
Unauthorized fabrication of parts	Garrison	Dissatisfied with work environment	57	20	23	
		Dissatisfied with career	49	35	16	.04
		Dissatisfied with aspects of both	51	40	8	
		Satisfied	63	24	13	
=====						
	Combat	Dissatisfied with work environment	44	19	37	
		Dissatisfied with career	38	47	15	.01
		Dissatisfied with aspects of both	29	59	12	
		Satisfied	41	46	13	

Table D-6-6. In your opinion, what is the net result in terms of unit effectiveness of using the (cont.) following irregular logistic procedure?					
Type of Procedure	Condition	Satisfaction with Job and Career	Harmful	Helpful	Neutral
Obtaining items or ser- vices from unauthorized sources	Garrison	Dissatisfied with work environment	50%	23%	27%
		Dissatisfied with career	35	33	31
		Dissatisfied with aspects of both	28	52	20
		Satisfied	52	29	19
					Conf. Level .02

Table D-6-7. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the following.

Group Norm	Condition	Satisfaction with Job and Career	Encourage	Discourage	Neutral	Confid. Level
A high skill level on the job	Combat	Dissatisfied with work environment	67%	0%	33%	
		Dissatisfied with career	100	0	0	.03
		Dissatisfied with aspects of both	80	13	7	
		Satisfied	93	0	7	
A high sense of motivation and esprit	Garrison	Dissatisfied with work environment	52	16	32	
		Dissatisfied with career	80	4	16	.00
		Dissatisfied with aspects of both	51	17	32	
		Satisfied	76	5	19	
Teamwork	Garrison	Dissatisfied with work environment	58	13	29	
		Dissatisfied with career	80	7	13	.00
		Dissatisfied with aspects of both	66	6	28	
		Satisfied	86	2	12	
Combat	Combat	Dissatisfied with work environment	100	0	0	
		Dissatisfied with career	100	0	0	.00
		Dissatisfied with aspects of both	80	0	20	
		Satisfied	100	0	0	

Table D-6-7. Indicate to what extent the work groups to which you have belonged have encouraged or (cont.) discouraged the following.

Group Norm	Condition	Satisfaction with Job and Career	Encourage	Discourage	Neutral	Confid. Level
A high sense of duty	Garrison	Dissatisfied with work environment	60%	17%	23%	.01
		Dissatisfied with career	69	5	26	
		Dissatisfied with aspects of both	57	14	27	
		Satisfied	80	2	18	
Giving top priority to flight safety	Garrison	Dissatisfied with work environment	65	13	22	.00
		Dissatisfied with career	94	2	4	
		Dissatisfied with aspects of both	77	6	17	
		Satisfied	89	2	9	
	Combat	Dissatisfied with work environment	100	0	0	.00
		Dissatisfied with career	88	0	12	
		Dissatisfied with aspects of both	73	13	13	
		Satisfied	93	0	7	
Avoidance of work	Garrison	Dissatisfied with work environment	19	45	35	.02
		Dissatisfied with career	11	71	18	
		Dissatisfied with aspects of both	23	46	31	
		Satisfied	15	68	17	

Table D-6-7. Indicate to what extent the work groups to which you have belonged have encouraged or (cont.) discouraged the following.					
Group Norm	Condition	Satisfaction with Job and Career	Encourage	Discourage	Neutral
Compliance with wishes of highly respected superiors	Combat	Dissatisfied with work environment	100%	0%	0%
		Dissatisfied with career	88	0	12
		Dissatisfied with aspects of both	73	13	14
		Satisfied	93	0	7
					Conf. Level .04

7.0

INTERSERVICE DIFFERENCES

Differences between the two Services surveyed--the Air Force and the Army -- with respect to attitudes towards the use of irregular logistics are relatively few in number, particularly when those due to sample composition are eliminated.¹ Out of 201 relevant questions, only 24 (12%) reflected a statistically significant difference due to service after elimination of differences due to irregularities in sample composition. These service differences are considered minimal, and in general are peripheral to the principal results of the study.

7.1 THE SITUATIONAL CONTEXT

Half of the questions in which responses reflected service differences dealt with situational context.

7.1.1 The Military Logistic Situation

Of 58 questions on the military logistic situation, 8 (14%) showed statistically significant service differences. The Army reflected a greater tendency in combat than the Air Force to use irregular logistics on their own initiative and in response to requests from others outside the chain of command (Table D-7-1).

¹ See Table 2-1, Section 2, of the study

Table D-7-1 When an individual in your position uses irregular logistic procedures, how often will it be in response to requests from individuals outside the chain of command? How often will it be on their own initiative?

Instigator	Condition	Service	Never or Seldom	Sometimes	Often or Always	Confid. Level
Other Individual	Combat	Air Force	45%	37%	18%	.05
		Army	35	38	27	
Own Initiative	Combat	Air Force	24	43	33	.02
		Army	17	32	51	

The Army felt less able to operate in garrison without use of irregular logistic procedures (Table D-7-2), and the Air Force respondents reflected less experience with being refused authorization for various types of items than Army respondents (Table D-7-3). The general sense of these differences is of a somewhat greater tendency toward irregular logistics by the Army--but only with respect to .14% of the situational questions asked. Put in the context of total situational response, this could well be primarily a confirmation of the elite status² (and hence presumed better support capability through regular logistic channels) characterizing the Air Force respondents units.

Table D-7-2 Under garrison conditions, if individuals in your current position never used any irregular logistic procedures, how well could they obtain necessary parts and supplies for weapons and operating systems?

Service	Poorly or Not at All	Adequately or Very well	Confidence Level
Air Force	44%	56%	.04
Army	65	35	

²The Air Rescue Service, which contains the bulk of Air Force helicopters is an elite group, and it was from this group that the study sample was taken.

Table D-7-3 In your experience, has the logistic system for any reason refused to authorize for issue or requisition by you, your buddies, or your unit, any items of the following types?

Nature of Item	Condition	Service	Never or Seldom	Sometimes	Often or Always	Conf. Level
Necessary to Mission Accompl.	Garrison	Air Force	65%	27%	8%	.00
		Army	37	44	19	
	Combat	Air Force	76	19	5	.00
		Army	54	26	20	
Potential Contribution to Mission Accompl.	Garrison	Air Force	43	44	11	.01
		Army	29	46	25	
	Combat	Air Force	60	34	6	.00
		Army	43	32	25	
Unrelated to Mission	Combat	Air Force	37	34	29	
		Army	31	28	41	.03

7.1.2

Types of Irregular Logistic Procedures

In Section 2 of the study it is noted that statistical (factor) analysis of the questionnaire results divided the types of irregular logistics procedures into two principal groups. These groups appeared to reflect normative associations made by the respondents. One group generally reflects relatively benign transgression of regulations, the other more serious breaches--normally with some implication of either ethical or criminal nature. There were only two noticeable differences between the Services in this case. First, the Army tended to associate two types of irregular logistic procedures with the more desirable group while the Air Force and the respondents as a whole associated them with the more normatively acceptable group.

Table D-7-4. In your opinion, what is the net result in terms of unit effectiveness of using each of the following irregular logistic procedures?

Type of Procedure	Condition	Service	Harmful Impact*	Helpful Impact*	Confid. Level	
					Neutral	Level
Use of bribes to obtain supplies	Combat	Air Force Army	54% 39	28% 46	18% 15	.04
Use of gifts or favors, such as liquor rations, to facilitate an irregular logistic procedure	Garrison	Air Force Army	69 57	7 20	23 22	.02
	Combat	Air Force	59 36	27 51	14 13	.00
Unauthorized fabrication of parts**	Garrison	Air Force Army	48 64	34 23	18 13	.01
	Combat	Air Force Army	30 45	51 41	19 14	.05

* The category "Harmful Impact" includes the responses "Very Harmful" and "Harmful;" the category "Helpful Impact" includes the responses "Very helpful" and "Helpful."

** Note that Unauthorized Fabrication of Parts is the only irregular logistic procedure perceived as helpful by a significantly larger percentage of Air Force personnel than Army personnel.

These two procedures were use of personnel of unauthorized purposes and use of authorized items or services for unauthorized purposes. Second, the Air Force tended to associate unauthorized stockpiling in garrison with the more undesirable group, whereas the Army and the respondents as a whole did not. The preceding are considered relatively minor differences between the Services. The use of a given irregular logistic procedure will normally depend on individual weighing of both the normative classification just described and the utilitarian classification reflected in the questionnaire ratings of harmful versus helpful. With respect to two of the normatively undesirable group of irregular procedures (bribery and the use of gifts and favors to obtain supplies and services), while the Army and Air Force respondents agreed on its normative association with the more undesirable group, the Air Force reflected a more unfavorable opinion from a utilitarian viewpoint concerning their use in combat (Table D-7-4). In garrison there is no significant difference between the Services with reference to the lack of utility of bribery (by a 4-1 ratio); however, the Air Force is more strongly negative in garrison with respect to the utility of gifts and favors. Army personnel are considerably more negative with respect to authorized parts fabrication than Air Force personnel. Perhaps the basing and support facilities of Air Force Units is more conducive to quality parts fabrication than is true for most Army helicopter units. More significant than these differences, however, is the fact that statistically significant differences did not exist between the Services with respect to the other twelve types of irregular logistics procedures, either in combat or garrison.

7.2 THE MOTIVATIONAL CONTEXT

Most service differences in a motivational context were associated with work group norms.

7.2.1 Group Norms

Of 36 questions on group norms, 7 (19%) showed significant service differences. The three areas in which work group norms differed were:

- Work group norms on avoidance of work;
- Work group norms on following regulations only when they appear reasonable; and
- Work group norms encouraging or discouraging the use of irregular logistic procedures for various purposes.

Many more Air Force respondents than Army respondents indicated encouragement of avoidance of work. For this particular question, Table D-7-5 may understate service differences in that officers and warrant officers (almost missing from the Air Force sample - Table D-1-1) were more vehement (i.e., more different from Army enlisted ranks) than the Air Force about discouraging avoidance of work. The statistical differences in the services are also influenced by a single significantly aberrant work group.

Table D-7-5. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged avoidance of work *					
Condition	Service	Encourage*	Discourage*	Neutral	Confidence Level
Garrison	Air Force	9%	73%	18%	.01
	Army	21	56	23	
Combat	Air Force	4	92	4	.05
	Army	18	77	5	

* Asked in the context of avoiding excess paperwork, other administrative/ bureaucratic requirements. May have been misinterpreted by some.

In combat, groups of Army personnel appear to provide much more encouragement to "follow regulations only when they appear reasonable" than is the case for the Air Force, (Table D-7-6), an interesting result in view of the Air Force reputation for informality compared to the other services. Tables D-6-7-8, and 9 indicate greater group encouragement of use of irregular logistic procedures in the Army than in the Air Force. In each case the use is directed at positive objectives. With respect to grouping of work norms using factor analysis techniques, only one possibly significant Service difference appeared. In garrison, both services grouped all four of the following reasons for use of irregular logistic procedures together:

- Insure the mission gets accomplished
- Get the job done faster
- Improve work group prestige
- Improve group living conditions

The Army grouped all four together in combat also. The Air Force split them into two groups. The first two reasons, which are mission oriented are in one group; The second two reasons which are group oriented, were in another group.

Table D-7-6. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged following regulations only when they appear reasonable.

Condition	Service	Encourage*	Discourage*	Neutral	Conf. Level
Combat	Air Force	29%	50%	21%	.01
	Army	58	18	24	

* In these and the following tables, the category "Encourage" includes the responses "Encourage a lot" and "Encourage somewhat;" the category "Discourage" includes the responses "Discourage a lot" and "Discourage somewhat."

Table D-7-7. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the use of irregular procedures to get the job done faster.

Condition	Service	Encourage	Discourage	Neutral	Conf. Level
Combat	Air Force	58	31	11	.01
	Army	83	10	7	

Table D-7-8. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the use of irregular procedures to improve work group prestige.

Condition	Service	Encourage	Discourage	Neutral	Conf. Level
Garrison	Air Force	36%	33%	31%	.00
	Army	57	16	27	
=====					
Combat	Air Force	35	31	34	.00
	Army	71	7	22	

Table D-7-9. Indicate to what extent the work groups to which you have belonged have encouraged or discouraged the use of irregular procedures to improve group living conditions.

Condition	Service	Encourage	Discourage	Neutral	Conf. Level
Garrison	Air Force	37	27	36	.00
	Army	55	16	29	

7.2.2

Individual Incentives

Of 77 questions on individual incentives, only 5 (6%) showed significant differences. This relative paucity of statistically significant service differences in individual incentives follows a pattern characteristic of other types of groups. Despite some differences in the situational environment, and in group norms, it appears that the end result in terms of motivation towards use of irregular logistic procedures is very similar in both Services. As shown in Table 10-7-11, and contrary to what one might expect based on group norm differences, in three out of five instances the Air Force personnel are more impelled towards irregular logistics than Army personnel. This emphasizes the remarkably close conformance between Army and Air Force personnel with respect to the incentives behind the use of irregular logistic procedures. The result of the statistical survey is a remarkably close interservice conformance with respect to individual incentives concerning use of irregular logistics. Of 77 questions on this subject only 5 reflected statistically significant differences, and in those 5 cases, the two services split as evenly as possible when considering in which service were personnel more impelled towards use of irregular logistics. Another potential area of Service difference concerns the statistical association of individual incentives cited in Section 3. While some Service differences of this nature existed they were not considered significant.

7.3

SUMMARY

This section the contents of which are referenced elsewhere in the study, contains all the statistically significant differences found after taking into account differences in sample composition (primarily, presence in the Army sample of an officer/

Table 10-7-11 Interservice Differences on Incentives Relating to Use of Irregular Logistic Procedures.
Indicate how much influence you think each of the reasons given has in deciding whether to use irregular procedures or prescribed procedures in a specific demand situation.

Incentive Type	Nature of Demand	Service	Influence To Use Irregular Procedures*	Influence To Use Prescribed Procedures*	Not An Influence	Con. Lev.
Acceptance by friends	Authorized and available	Air Force Army	25% 19	5% 19	70% 62	.04
Avoid punishment	Unauthorized	Air Force Army	36 48	26 14	38 38	.00
Comply with direct orders	Unauthorized	Air Force Army	72 58	6 15	22 28	.02
Because task is important	Unauthorized	Air Force Army	78 64	4 12	18 24	.01
To maintain safety standards	Authorized and available	Air Force Army	29 43	37 28	34 29	.03

*The category "Influence To Use Irregular Procedures" consists of the responses "strong influence to use irregular logistic procedures" and "some influence to use irregular logistic procedures." A similar combination of responses is indicated by the category "Influence To Use Prescribed Procedures."

warrant officer/command element essentially lacking in the Air Force sample). The interservice differences found are considered to be significant primarily in terms of the relative lack of difference found between the Services, particularly in terms of individual incentive for use/non-use of irregular logistic procedures.

APPENDIX E

SELECTED BIBLIOGRAPHY

APPENDIX E

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This Final Report defines the basic concept of the incentive structure for the use of irregular (unauthorized) logistic procedures in the military, and presents the findings of a 1979 field survey in which helicopter maintenance, supply, and command personnel provided data on the situational and motivational contexts for the use of irregular procedures. A section on conclusions and recommendations emphasizes the perceived need for some use of irregular logistic procedures in overcoming the lack of immediate availability of items necessary for mission accomplishment. Appendices provide additional quantitative and qualitative findings on the subject.		