

Technical Paper 380



LEVEL II

**FIELD EVALUATION OF THE COMBAT
COMMANDER'S GUIDE TO AERIAL SURVEIL-
LANCE AND RECONNAISSANCE RESOURCES**

Uldi Shvern

HUMAN FACTORS TECHNICAL AREA

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July 1979

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This research evaluated the Combat Commander's Guide to Aerial Surveillance and Reconnaissance Resources on its usefulness, accuracy, clarity, and completeness. → next page
An evaluation questionnaire was prepared and distributed, together with copies of the Commander's Guide, to 100 officers at U.S. Army units in Korea, Germany, Fort Hood, Tex., and Fort Bragg, N.C. Participants were required to

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have either command experience at the battalion level or above or G3/S3 experience. The questionnaire included a structured evaluation of the main sections of the Commander's Guide as well as a global assessment of the document. Participants could also elaborate further on their answers or comment on topics not specifically addressed in the questionnaire. Sixty questionnaires were returned--27 from battalion commanders and executive officers and 33 primarily from officers in G3/S3 assignments.

The individual sections of the Commander's Guide were judged to be more useful than the document as a whole. This seemingly paradoxical result was obtained with both the structured rating scales and the open-ended comments. Raters considered the Commander's Guide to be more suitable for the G2/S2 than for the battalion or brigade commander. Raters' comments concerning possibly excessive detail for a commander's needs are consistent with this finding. Reference to specific AS&R assets are outdated in many instances. Rapid changes in the AS&R area dictate frequent revision of any publication that refers to specific equipment.

The anticipated frequency of use of the Commander's Guide would increase greatly during wartime. If the Commander's Guide is revised, fundamental restructuring would be required to achieve high use rates by commanders during peacetime conditions. A consideration of the type of AS&R information that commanders are able and willing to use, as opposed to what they should ideally use, would be required. Otherwise a technically excellent publication might remain unused on the commander's shelf or be passed on to his G2 or S2. Unless the user has become familiar with the Commander's Guide, its effectiveness in an emergency is unlikely.

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Technical Paper 380

FIELD EVALUATION OF THE COMBAT COMMANDER'S GUIDE TO AERIAL SURVEIL- LANCE AND RECONNAISSANCE RESOURCES

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COMMANDER'S GUIDE TO AERIAL SURVIVAL
LANCE AND RECONNAISSANCE RESOURCES

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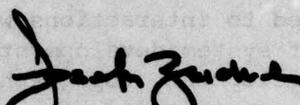
FOREWORD

The Human Factors Technical Area of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is concerned with the greater demands placed on human resources by increasingly complex battlefield systems for acquiring, transmitting, processing, and disseminating information. Research in this technical area focuses on human performance problems related to interactions within command and control centers, as well as issues of system development. Research is conducted in areas such as software development, topographic products and procedures, tactical symbology, user-oriented systems, information management, staff operations and procedures, decision support, and sensor-system integration and use.

One area of special concern is the efficient, effective use of surveillance and reconnaissance resources. The continued proliferation of information-gathering equipment, rapid technological changes, and the demands of modern warfare have dramatically increased the complexity of the surveillance and reconnaissance system. Skilled and knowledgeable users and collection managers must insure that the use of this equipment meets command needs.

The collection manager must understand user needs and procedures for planning, coordinating, and managing equipment. The tactical commander must understand the capabilities and limitations of the surveillance and reconnaissance system. Previous ARI research (Technical Paper 325) indicated that combat arms students receive little training in aerial surveillance and reconnaissance (AS&R) resources, and the students believed they needed more information in this area. To help meet this demand, ARI developed the "Combat Commander's Guide to Aerial Surveillance and Reconnaissance Resources" in 1974. This report describes a field evaluation of the Commander's Guide undertaken to determine its usefulness to the combat commander; the report also identifies revisions required because of changes in doctrine and advances in technology.

Research on sensor systems integration and utilization is conducted as an in-house effort, augmented through contracts with organizations selected for their abilities to perform research on sensor systems. The present in-house research was conducted in response to general requirements of Army Project 2Q763743A774 and to special requirements of the U.S. Army Intelligence Center and School, Fort Huachuca, Ariz. Special requirements are contained in Human Resource Need 78-78, "Evaluation of the Combat Commander's Guide to Aerial Surveillance and Reconnaissance Resources."


JOSEPH ZEIDNER
Technical Director

FIELD EVALUATION OF THE COMBAT COMMANDER'S GUIDE TO
AERIAL SURVEILLANCE AND RECONNAISSANCE RESOURCES

BRIEF

Requirement:

To evaluate the Commander's Guide with respect to its usefulness, accuracy, clarity, and completeness and to identify portions that are obsolete or inaccurate.

Procedure:

An evaluation questionnaire was prepared and distributed, with copies of the Commander's Guide, to 100 officers at U.S. Army units in Korea, Germany, Fort Hood, Tex., and Fort Bragg, N.C. Participants were required to have either command experience at the battalion level or above or G3/S3 experience. The questionnaire was divided into three parts: (a) participant background information; (b) evaluation of six major sections of the Commander's Guide and field aids (infantry/artillery/armor); and (c) global evaluations of the Commander's Guide. Participants could also elaborate on any of their answers or comment on topics not addressed in the questionnaire.

Findings:

Of 100 questionnaires, 60 were returned--27 from battalion commanders and executive officers and 33 primarily from officers in G3/S3 assignments.

There was uniformity in the ratings of the individual sections on the factors of usefulness, accuracy, clarity, and completeness. On a scale of 1 to 4, no factor was rated below 2.60 or above 3.20 for any section. No section averaged below 2.83 or above 3.13 across these four factors.

Although usefulness--the most crucial factor--was rated at an average of 2.98 for the individual sections, it scored only 2.17 for the Commander's Guide as a whole (with respect to the rater's present assignment). The Commander's Guide was perceived as being far more useful "elsewhere in the Army" (average rating of 3.18). With respect to each of five specific uses listed in the questionnaire, however, a much greater percentage of the raters judged the Commander's Guide to be suitable in their present assignment than "elsewhere in the Army." Revision of the Commander's Guide was expected to raise its usefulness only minimally (from 2.17 to 2.39 on a scale of 1 to 4).

The open-ended comments were evenly divided between favorable and unfavorable when they pertained to individual sections, but when these comments referred to the Commander's Guide as a whole, more than two-thirds were unfavorable. Raters considered the Commander's Guide most suitable for the G2/S2, considerably less appropriate for the battalion or brigade (Bn/Bde) commander and G3/S3, and even less suitable for military intelligence (MI) officers in general. Obsolescence of references to AS&R equipment was the most frequently submitted comment, particularly by noncommanders.

The anticipated frequency of use of the Commander's Guide was much greater for wartime than for peacetime conditions.

Utilization of Findings:

The portions of the Commander's Guide dealing with specific AS&R assets should no longer be used for either reference or training, because numerous changes have occurred since publication of the Commander's Guide in 1974.

Fundamental restructuring of the Commander's Guide is necessary to obtain high peacetime utilization rates by commanders. However, if references to obsolete AS&R assets and outdated doctrine were updated the document would retain its original level of usefulness for G2/S2 personnel.

FIELD EVALUATION OF THE COMBAT COMMANDER'S GUIDE TO
AERIAL SURVEILLANCE AND RECONNAISSANCE RESOURCES

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FIELD EVALUATION OF THE COMBAT COMMANDER'S GUIDE TO
AERIAL SURVEILLANCE AND RECONNAISSANCE RESOURCES

INTRODUCTION

The Army Research Institute (ARI) developed the "Combat Commander's Guide to Aerial Surveillance and Reconnaissance Resources" in 1974 to supplement the manuals available to combat commanders. Research had found that combat arms officers received limited training in the use of aerial surveillance and reconnaissance (AS&R) resources; these officers believed they could use more information on the effective use of AS&R.¹

The Commander's Guide was developed for the combat commander concurrently with the development of the "Aerial Surveillance and Reconnaissance MANAGER" for the G2 air officer (now the surveillance and reconnaissance officer). The two documents are parallel because similar methodology was used in their development and each was designed for a specific need in AS&R.

The Commander's Guide was based on material drawn from a number of manuals and training documents; this material was summarized and integrated into a convenient format. Distributed worldwide in 1974, the Commander's Guide has been used in the training of military intelligence (MI) active and reserve officers and has been used as a reference by numerous individuals, units, and organizations throughout the Army.

The Commander's Guide was intended to help the combat commander, primarily at battalion and brigade levels, take full advantage of the AS&R system. The objectives of the Commander's Guide were to (a) describe the AS&R system, (b) show commanders how to use the system, and (c) help commanders to visualize what to expect from the AS&R system as they prepare estimates of the tactical situation.

The Commander's Guide is organized around the capability of the AS&R system within each of three tactical environments--offense, defense, and retrograde. Information is further organized for the infantry, armor, and artillery branches to permit each to better apply AS&R capability to specific fire and maneuver requirements.

The first section in the Commander's Guide, "The Army Aerial Surveillance and Reconnaissance System," explains the intelligence cycle and the steps involved in the AS&R system's response to the commander's requests for information.

¹Vecchiotti, R. A., Berry, J. L., & Narva, M. A. Training in Utilization of Surveillance and Reconnaissance Resources by Combat Arms Officers. ARI Technical Paper 325, September 1978.

The "Aerial Surveillance and Reconnaissance Assets" section summarizes the functions and capabilities of key personnel and equipment in the AS&R system. The AS&R organizational structure and the responsibilities of its components are shown. A series of figures shows the AS&R resource distribution within various divisions. The section also discusses availability of support from higher echelon.

The third section of the Commander's Guide, "Information Request and Response," explains the request procedures, discusses the key items in the request form, and explains the types of reports available from the AS&R system. This section also includes an AS&R Information Request Procedure Check List.

"The Infantry Commander and AS&R" section discusses the aspects of AS&R that are most pertinent to the infantry commander's role. His information requirement categories are divided into tactical information and environmental information, which are further subcategorized. Information requirement categories are considered separately for each of the three major tactical actions of defense, offense, and retrograde. Within each tactical action, the informational products of the AS&R system are given in terms of AS&R mission capability and AS&R reports. The section concludes with practical exercises for the infantry commander.

Similar sections were developed for the artillery commander and the armor commander. Table 1 lists the main sections and subsections of the Commander's Guide.

Smaller format (5 x 7 inches) "field aids" were also prepared for each of the three combat arms areas. These field aids include summaries of the first three sections of the Commander's Guide and most of the material found in the appropriate combat arms section. They were designed for portability in situations where the bulkier Commander's Guide is not as convenient.

Although the Commander's Guide has been in use for several years, no systematic assessment had been made of its usefulness or of the potential need for revision and updating. The current research was designed to determine whether the Commander's Guide was still fulfilling its original purpose. A questionnaire was designed to elicit comments and ratings concerning specific aspects of the Commander's Guide. This assessment technique was chosen because it permitted explicit and efficient evaluation of the most crucial features of the document. The questionnaire approach was previously used for evaluating the "Aerial Surveillance and Reconnaissance MANAGER."²

² Bedarf, E. W., and Potash, L. M. A Field Evaluation of the Aerial Surveillance and Reconnaissance MANAGER. ARI Research Memorandum 75-14, December 1975.

Table 1

Main Sections of the Commander's Guide to
Aerial Surveillance and Reconnaissance Resources

Section	Title
1	The Army Surveillance and Reconnaissance System
1.1	The Intelligence Cycle
1.2	The AS&R Response to the Combat Commander
2	Aerial Surveillance and Reconnaissance Assets
2.1	AS&R Organizational Structure
2.2	AS&R Key Personnel
2.3	AS&R Equipment
2.4	Capabilities of the Basic Aerial Sensors
3	Information Request and Response
3.1	Request Procedures
3.2	The Request Form
3.3	Types of Reports
4	Information Request Check List
5	The Infantry Commander and AS&R
5.1	Information Categories/Product Matrix
5.2	Interaction of Infantry Commander with Other Combat Arms
5.3	The Infantry Commander Unique Requirements for AS&R in a Defensive Situation
5.4	The Infantry Commander Unique Requirements for AS&R in an Offensive Situation
5.5	The Infantry Commander Unique Requirements for AS&R in a Retrograde Situation
5.6	Practical Exercises for the Infantry Commander
6	The Artillery Commander and AS&R (subsections similar to those in Section 5)
7	The Armor Commander and AS&R (subsections similar to those in Section 5)

OBJECTIVE

To determine the usefulness of the Commander's Guide and identify any shortcomings, including obsolete information.

METHOD

Description of Questionnaire

Organization. The questionnaire is organized into three sections (see Appendix A). The first section consists of items relating to the respondent's background, including rank, current and previous position, related assignments, previous AS&R training, and specific current duties. The second section permits a specific rating of each major section of the Commander's Guide on accuracy, completeness, usefulness, and clarity. In addition, open-ended questions allow the rater to identify errors, omissions, or obsolete portions. The final section of the questionnaire involves a global evaluation of the Commander's Guide as well as ratings of type of utilization, frequency of use, usefulness of the Commander's Guide as it is, and usefulness after modifications recommended by the rater. Space is also provided for additional comments or elaborations of previous answers.

Questionnaire response types. The types of responses required for the questionnaire items can be categorized as follows:

- Rating. Various features of the Commander's Guide are rated on a 4-point scale. Some questions pertaining to frequency of certain activities use a 7-point scale.
- Choosing among alternatives. The participant is required to choose the most appropriate of the alternatives listed below the question.
- Filling in the blanks. A brief answer is required from the participant.
- Free response. The participant may answer the question in any way. The answer can be brief or lengthy.

Participants

The questionnaire, as well as a copy of the Commander's Guide, was distributed to 100 officers at U.S. Army units in Korea, Germany, Fort Hood, Tex., and Fort Bragg, N.C. The participants were required to have command experience at the battalion level or above or G3/S3 experience.

RESULTS

In responding to the questionnaire, participants rated each of the major sections of the Commander's Guide and the field aids before rating the Commander's Guide as a whole. For clarity, the results are presented in reverse order, preceded by a description of the participants. The questionnaire in Appendix A shows the distribution of responses for each of the ratings.

Description of Participants

Of the 100 questionnaires distributed, 60 were completed and returned. Of these 60 participants, 27 were lieutenant colonels (LTC), and 33 were of lower rank, primarily majors. Most of the LTCs were battalion commanders, but several were executive officers. Those below the LTC rank were primarily in G3/S3 assignments, although several were in S2 assignments. For simplicity, all LTCs are referred to as commanders, the rest as noncommanders.

Three commanders and 12 noncommanders had received formal training in AS&R; similarly, 4 commanders and 11 noncommanders had previous assignments in AS&R. There was almost a complete correspondence between personnel having received formal training and having had previous assignments in AS&R.

Raters were asked to indicate how frequently they performed each of six activities described in the Commander's Guide concerning AS&R capability for providing tactical information. Both commanders and noncommanders performed most of these activities between once a month and once a year (Table 2); only four commanders and three noncommanders indicated that they performed these activities less than once a year. Thus, the Commander's Guide appears to support the AS&R tasks that these officers encounter as part of their duties.

Evaluation of Commander's Guide

The usefulness of the Commander's Guide in the rater's present position was judged, on the average, to be 2.17 on a scale of 1 to 4 (1 = not useful, 2 = somewhat useful, 3 = useful, 4 = very useful). This rating places the Commander's Guide at just above the "somewhat useful" level. Ratings varied little between commanders (2.08) and noncommanders (2.25).

Greater usefulness was seen for the Commander's Guide "elsewhere in the Army" however (an average rating of 3.18). Only 38 of the 59 officers rating the usefulness of the Commander's Guide in their present positions rated it for application elsewhere in the Army. This much higher rating

did not result from any strong tendency of the less favorably disposed raters to skip this item, since these 38 raters had assessed the usefulness of the Commander's Guide in their present position to be 2.26. The 23 officers who assessed the usefulness of the Commander's Guide "elsewhere in the Armed Forces" assigned it an average rating of 2.78.

Table 2

Frequency of Performance of Six Specified AS&R Activities by Participants

Position	Frequency		
	More than once a month	Once a month to once a year	Less than once a year
Commanders	10	80	66
Noncommanders	29	117	49
Total	39	197	115

Despite the higher ratings of usefulness of the Commander's Guide "elsewhere in the Army" than in the rater's present position, a much greater percentage of the raters indicated various specific types of uses as feasible in their present positions than elsewhere. For instance, 70% judged the Commander's Guide to be usable as a desk reference in their present positions, whereas only 17% indorsed this use elsewhere in the Army (Table 3). None of the specific uses was judged applicable elsewhere in the Army or in other services by 65% of the raters. It appeared that the raters considered the Commander's Guide more useful in some vague, general sense than for the five purposes listed in the questionnaire.

Another measure of the perceived usefulness of the Commander's Guide is anticipated frequency of use. Less than one-tenth of the raters expected to use the Commander's Guide more often than once a month, and nearly one-fourth expected to use it less than once a year. During war-time, however, frequency of use would change substantially. Although 20% of the raters would still use it less than once a year, 55% of them would use it more than once a month (Table 4).

Table 3

Percentages of Raters Judging the Commander's Guide to be Useful for Different Applications in Various Positions

Application	Position			
	Current position	Previous position	Elsewhere in Army	Elsewhere in armed forces
Desk reference	70.6	58.6	17.2	6.9
Preparation of instructional materials	46.6	43.1	19.0	3.4
Self-training aid	69.0	51.7	22.4	3.4
Aid in exercises	75.5	70.3	19.0	3.4
Aid in operational setting	58.6	51.7	17.2	1.7

Table 4

Percentage of Raters Expecting Given Frequency of Use of Commander's Guide Under Two Conditions

Condition	Expected frequency of use		
	More than once a month	Once a month to once a year	Less than once a year
Currently	8.3	68.3	23.4
During wartime	55	25	20

Almost all commanders and noncommanders thought that G2/S2 personnel should receive the Commander's Guide. The "Aerial Surveillance and Reconnaissance MANAGER" was written for the G2/S2 staff, however, and the Commander's Guide probably lacks sufficient detail to serve G2/S2 needs. The respondents' reactions reflect a common tendency, when faced with areas of overlapping responsibility, to assume that the other person is more interested in topics that fall in that overlap. Only 63% of the commanders and less than 80% of the noncommanders viewed commanders, the target audience for the Commander's Guide, as appropriate recipients of this document (Table 5). An almost identical percentage of raters indicated that all G3/S3 personnel should receive the Commander's Guide.

Raters felt that the Commander's Guide should receive a wider distribution than would be indicated by ratings of anticipated frequency of usage.

Table 5

Percentage of Raters Indicating That All Officers in Specified Positions Should Receive Commander's Guide

Rater position	Recipient position			
	Bn & Bde commander	G2/S2	G3/S3	MI officers
Commander	63.0	96.3	59.3	51.9
Noncommander	78.8	97.0	78.8	60.6

Apparently, revising the manual to correct the errors, updating it to reflect changes in AS&R, and making other modifications would have only a slight effect on the Commander's Guide's perceived usefulness; the usefulness rating in this case rises to only 2.39 from the original 2.17.

General Comments

The raters volunteered 77 "free responses" on the Commander's Guide as a whole. The comments were categorized as very positive, positive, negative, and very negative. Over two-thirds of the responses were judged to be negative or very negative. Table 6 shows the number of responses in each category, with an illustrative example for each category. The categories constitute a rough ordinal scale, and not all comments within a given category are equally positive or negative.

Evaluation of Specific Sections

The ratings of each of six major sections of the Commander's Guide and of the field aids (for infantry, artillery, and armor) on each of the four rating factors were uniform (Table 7). The one exception was the relatively low rating given the AS&R Assets section on accuracy (2.60 on a scale of 1 to 4). The other 35 ratings ranged from 2.79 to 3.20, with 24 ratings falling between 2.92 and 3.09. This narrow range of ratings could indicate either uniform quality of the different sections or a failure of the raters to evaluate each section independently. The one exception (AS&R Assets) was rated lower on accuracy, because many of the raters noticed that the lists of aerial assets had become obsolete.

Table 6

Number of Positive and Negative Comments Given
by the Raters on the Commander's Guide as a Whole

Rating	No. of comments	Example
Very positive	3	Publication is clear, understandable, and will be a valuable aid to commanders and key staff.
Positive	21	Document is well written.
Negative	45	AS&R Assets need to be updated.
Very negative	8	Recommend Guide be eliminated.

Table 7

Mean Ratings for Different Sections of the Commander's Guide

Section	Accuracy	Completeness	Usefulness	Clarity
1--Army AS&R System	3.03	2.98	3.15	3.05
2--AS&R Assets	2.60	2.79	2.92	3.02
3--Information Request and Response	3.13	3.20	3.11	3.09
5--Infantry Commander and AS&R	3.13	3.02	2.94	3.09
6--Artillery Commander and AS&R	3.07	2.96	2.87	2.93
7--Armor Commander and AS&R	3.09	3.05	2.92	3.00
Field Aid to AS&R Utilization (Infantry)	2.96	2.88	2.98	3.00
Field Aid to AS&R Utilization (Artillery)	2.88	2.88	2.93	2.89
Field Aid to AS&R Utilization (Armor)	3.02	2.98	2.96	3.00

Raters were encouraged to identify the features that were either positive or negative in each section. Of the 60 participants, only 6 did not offer specific comments. Participants made 191 positive and 197 negative comments. These comments are, of course, opinions; no systematic evaluation of their validity was made. Similarly, no assessment of the relative significance of the different comments was made. Some raters questioned the value of an entire section, whereas others only suggested a minor change in the same section. For instance, a claim that a section is misleading is a serious charge, but the mention of a typographical error is trivial.

The negative comments were categorized as relating to obsolescence, inaccuracies, or other deficiencies. Obsolescence refers to items that were true at the time the Commander's Guide was prepared but are not true currently. Inaccuracies are items that were not true at the time the manual was prepared. All rater assertions of inaccuracy were placed in that category except those known to refer to obsolescence. Deficiencies include such items as typographical errors, the need to cover additional topics, inappropriateness of some topics for a commander, unsatisfactory presentation style, and insufficient or excessive detail. Table 8 shows the number of comments in each category for each section.

Table 8

Number of Comments on Each Section of the Commander's Guide by Category of Comment

Section	Category of comment			
	Favorable	Obsolete	Inaccurate	Deficient
1--Army AS&R System	35	3	6	17
2--AS&R Assets	34	54	15	21
3--Information Request and Response	31	1	7	9
5, 6, 7--Infantry/Artillery/Armor Commander and AS&R	54	5	6	21
Field aids	37	12	2	18
Total	191	75	36	86

The following paragraphs summarize the most frequent comments on each section of the Commander's Guide and the field aids. These and other comments are further summarized and listed according to frequency in Appendix B.

Section 1--The Army AS&R System. The chief advantages of this section were that it provided good introductory background material (15 responses) and was a useful summary of the AS&R intelligence cycle (8 responses). Five raters approved of its briefness or conciseness (5 pages). However, four raters judged it to be too lengthy or detailed, and three considered it too detailed for a commander.

Section 2--AS&R Assets. This section evoked the most free responses. More raters (24) commented on the obsolescence of the aircraft inventory than on any other feature. Commanders appeared to be less aware of this problem, since only 7 of 27 mentioned it; however, over half (17 of 33) of the noncommanders noted the obsolescence. The next most common response (16 raters) described this section as a complete, concise guide to AS&R assets. Evidently, these two characterizations are not mutually exclusive, since 7 raters made both of these judgments. Five additional responses indicated that the charts (tables) were particularly useful and handy. A total of 14 raters mentioned that the radar inventory, the organizational structure, or the aircraft capability had changed. Similarly, two raters mentioned the need to include the Combat Electronic Warfare Intelligence (CEWI) battalion in this section. Two others felt that more discussion was needed on side-looking airborne radar/infrared (SLAR/IR). Despite the relative obsolescence of the hardware lists, this section was not rated low on usefulness; apparently the raters felt the section was still helpful.

Section 3--Information Request and Response. Most comments concerning this section were favorable. The clarity of presentation of intelligence request procedures and channels was mentioned by 14 raters. Six others praised the step-by-step guide to report preparation and form use. Three comments mentioned the practice of each division or major command using its own AS&R request format rather than the one illustrated in this section. Two raters felt the material was not oriented toward the battalion level, whereas two others thought it was a good reference or summary for the battalion or brigade S2.

Sections 5, 6, and 7--The Infantry/Artillery/Armor Commander and AS&R. The comments for these sections are combined because the sections are identically organized and the material is similar. In addition, most of the raters indicated that identical comments applied to all three sections. The AS&R information matrices were the most popular feature, with 12 raters mentioning their usefulness. Seven others considered these sections to be a good guide with respect to AS&R information during tactical operations. Two or three complained, in each case, that doctrine was not current; reconnaissance mission time would not be as great as

indicated; sections were not useful for the combat commander (S2 deals with these areas); the sections were too repetitious; and the material was too general, obvious, or intuitive.

Field Aids. The field aids were praised for their clarity, conciseness, and compactness by 14 raters. Nine thought the pocket-size format was helpful, but two others maintained that the field aid was too large to fit in a pocket. Nine raters noted that the equipment references were obsolete, and two noted that the organization was obsolete. Five reviewers thought the matrices were useful.

DISCUSSION

Usefulness, obsolescence, and appropriate user population were the main issues emerging from an analysis of responses to the questionnaire. Only in the case of obsolescence were the responses consistent and unambiguous. Usefulness proved to be particularly difficult to assess; the apparent inconsistency of ratings suggests the use of caution in drawing conclusions. Unless the user population is also considered, usefulness cannot be adequately described.

Usefulness

Although the Commander's Guide as a whole was rated as somewhat useful in the rater's current position (2.17), the individual sections received much higher ratings of usefulness (between 2.87 and 3.15). This is not necessarily a paradoxical case of the whole being less than the sum (or average) of its parts. In making the global evaluations, the evaluators were specifically instructed to assess the usefulness of the Commander's Guide in a specific context--their current positions. No such context was provided for the ratings of individual sections, leaving the raters free to judge usefulness with respect to any position they deemed appropriate.

The high rating (3.18) given the Commander's Guide for usefulness elsewhere in the Army also suggests that the apparently contradictory findings may be the result of differences in perspective of the raters when responding to different sections of the questionnaire. This hypothesis, however, is undermined by the low percentage of raters that consider the Commander's Guide to be useful elsewhere in the Army for five specific applications (Table 3). In fact, for each specific application the Commander's Guide was judged to be most useful in the rater's current position.

It is possible that a "halo" effect was involved in evaluating individual sections: The relatively high ratings assigned to accuracy, completeness, and clarity may have caused some evaluators to think it would be inconsistent to rate usefulness any lower.

An alternate measure of usefulness of the Commander's Guide is the expected frequency of use (Table 4). Even during wartime, 20% of the raters (33% of the commanders) would use it less than once a year (perhaps meaning "never"). This indication of perceived usefulness is more consistent with the global evaluation of the Commander's Guide than with the ratings of the individual sections. It is also consistent with the bulk of negative comments on the Commander's Guide as a whole (Table 5). Nevertheless, the fact that 55% of the raters would use the Commander's Guide more than once a month in wartime (compared to less than 10% who would use it that frequently in peacetime) suggests that there is a basic disagreement concerning the usefulness of this document. Clearly, the raters who would use the Commander's Guide during wartime consider that it has some utility. Just as clearly, the 20% of the raters who would not use it, even under those conditions, consider it useless.

The contradictory findings concerning the usefulness of the Commander's Guide preclude any sweeping generalization; each rating depended greatly on the measure considered and its context. If a "best" assessment of usefulness must be selected, it would probably be frequency of use, because of its construct validity. High frequency of use implies, and perhaps comprises, high usefulness. Warfare constitutes the most meaningful context for evaluating a document intended for combat commanders; rate of use in this environment surely has greater significance than anywhere else. Granted these basic premises, the Commander's Guide can be characterized as useful to most of the raters, although 20% of the raters rejected it even for wartime application.

Obsolescence

Continuing innovations in AS&R equipment inevitably make inventory listings obsolete. Annual revision is probably necessary to keep equipment lists current. Less frequent updates are adequate if specific references to model numbers of equipment or quantities of items per various unit sizes are omitted or minimized; this approach could be a viable option, since many of the raters considered the Commander's Guide too detailed for a battalion or brigade commander. Because barely one-fourth of the commanders indicated that equipment listings were obsolete, it is probable that commanders do not directly use much of the specific information in the Commander's Guide. (Whether they should do so is a question beyond the scope of this discussion.)

Organizational structure and doctrine change less rapidly than equipment. Because such changes affect a commander more directly, however, there would be a greater need to update those portions of the Commander's Guide as changes occur.

User Population

Although the Commander's Guide was developed for use by combat commanders, most raters considered it more suitable for the G2/S2 than for the commander. It was considered as suitable for the G3/S3 as for the commander, and only moderately less appropriate for MI officers in general. These opinions may be a reasonably accurate reflection of the probable use of the Commander's Guide by various categories of personnel. Whether this coincides with the best use of this document is a separate issue. In any case, the participants believed that commanders would not be the document's primary users.

Any revision and updating of the Commander's Guide will need to be based on a reconsideration of the target audience and a reexamination of the information requirements of that audience. A distinction should be made between "best possible results" and "best results possible"; that is, even if it can be demonstrated that a commander (or S2, G3, etc.) needs certain information, it may be better to provide some less useful information if such information is more likely to be used. The potential usefulness of a revised Commander's Guide is irrelevant if use proves to be low.

SUMMARY AND CONCLUSION

To determine the usefulness of the Commander's Guide and to identify shortcomings, an evaluation questionnaire was distributed to 100 Army officers to permit systematic and comprehensive assessment of the document. Sixty questionnaires were returned--27 from battalion commanders or executive officers, and 33 primarily from officers in G3/S3 assignments.

The individual sections of the Commander's Guide were judged to be more useful than the document as a whole. This seemingly paradoxical result was obtained with both the structured rating scales and the open-ended comments.

Raters considered the Commander's Guide to be more suitable for the G2/S2 than for the battalion or brigade commander. Their comments concerning possibly excessive detail for a commander's needs are consistent with this finding.

References to specific AS&R assets are outdated in many instances. Recent and continuing rapid changes in the AS&R area require frequent revision of any publication that refers to specific equipment. Revision of the Commander's Guide to reflect recent changes in AS&R assets and doctrine would probably have little effect on its use by commanders. The raters felt that revising the Commander's Guide according to their recommendations would raise its usefulness only minimally.

The anticipated frequency of use of the Commander's Guide would increase greatly during wartime. If the Commander's Guide were revised, it would need fundamental restructuring to achieve high use rates by commanders during peacetime conditions. A consideration of the type of AS&R information that commanders are able and willing to use, as opposed to what they should ideally use, would be required. Otherwise, a technically excellent publication might remain unused on the commander's shelf or be passed on to his G2 or S2. Unless the user has become familiar with the Commander's Guide, its effective use in an emergency is unlikely.

APPENDIX A

QUESTIONNAIRE ON THE USES OF "COMBAT COMMANDER'S
GUIDE TO AERIAL SURVEILLANCE AND RECONNAISSANCE RESOURCES"

Background Information

NAME _____ (optional)

ADDRESS _____ (optional)

ORGANIZATION _____

RANK (check one)

14* (1) CPT

19 (2) MAJ

27 (3) LTC

_____ (4) COL

_____ (5) BG

CURRENT POSITION (check one)

_____ (1) Brigade Commander

19 (2) Battalion Commander

13 (3) G3/S3

28 (4) Other (please specify)

PREVIOUS POSITION _____

* Includes one lieutenant

Have you had previous assignments in aerial surveillance and reconnaissance (AS & R)? If so, please list.

Position

Date

Have you received any formal training in AS & R? If so, please list.

School/Course

Date

How often do your duties require you to do the following: (Circle one number for each activity)

a. Obtain information about specific AS & R assets and their capabilities.

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
5 1	3 2	2 3	5 4	21 5	6 6	16 7

b. Consider the AS & R mission capabilities for tactical information categories (e.g., weapons, vehicles) for different tactical actions.

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
2 1	2 2	4 3	6 4	22 5	11 6	11 7

c. Consider the AS & R reports available or obtainable for tactical information categories for different tactical actions.

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
5 1	2 2	2 3	0 4	25 5	11 6	12 7

d. Consider the AS & R mission capabilities for environmental information categories (e.g., topography, vegetation) for different tactical actions.

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
2 ₁	1 ₂	2 ₃	4 ₄	17 ₅	14 ₆	18 ₇

e. Consider the AS & R report available or obtainable for environmental information categories for different tactical actions.

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
2 ₁	2 ₂	1 ₃	4 ₄	15 ₅	18 ₆	16 ₇

f. Prepare lesson plans for AS & R training.

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
0 ₁	0 ₂	1 ₃	1 ₄	6 ₅	10 ₆	40 ₇

30

PART I

Rate each of the major sections of the Commander's Guide on accuracy, completeness, usefulness, and clarity. (Circle one alternative in each row.)

1. The Army Aerial Surveillance and Reconnaissance System (Section 1).

a.	not accurate 1. 1	somewhat accurate 2 5	accurate 3 42	very accurate 4 9
b.	not complete 1 3	somewhat complete 2 9	complete 3 33	very complete 4 14
c.	not useful 1 1	somewhat useful 2 23	useful 3 22	very useful 4 14
d.	not clear 1 3	somewhat clear 2 6	clear 3 36	very clear 4 15

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

2. Aerial Surveillance and Reconnaissance Assets (Section 2).

a.	not accurate 1 9	somewhat accurate 2 11	accurate 3 31	very accurate 4 6
b.	not complete 1 6	somewhat complete 2 8	complete 3 34	very complete 4 8
c.	not useful 1 3	somewhat useful 2 12	useful 3 31	very useful 4 13
d.	not clear 1 3	somewhat clear 2 4	clear 3 40	very clear 4 11

What are the chief advantages of this section?

What are the main defects (e.g., errors omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

3. Information Request and Response (Section 3).

a.	not accurate 1	1	somewhat accurate 2	2	accurate 3	41	very accurate 4	11
b.	not complete 1	0	somewhat complete 2	4	complete 3	36	very complete 4	15
c.	not useful 1	0	somewhat useful 2	12	useful 3	27	very useful 4	18
d.	not clear 1	1	somewhat clear 2	6	clear 3	37	very clear 4	13

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

4. The Infantry Commander and AS & R (Section 5).

a.	not accurate 1	0	somewhat accurate 2	3	accurate 3	35	very accurate 4	8
b.	not complete 1	2	somewhat complete 2	4	complete 3	31	very complete 4	9
c.	not useful 1	4	somewhat useful 2	7	useful 3	26	very useful 4	12
d.	not clear 1	1	somewhat clear 2	3	clear 3	34	very clear 4	9

What are the chief advantages of this section?

What are the main defects (e.g., errors omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

6. The Armor Commander and AS & R (Section 7).

a.	not accurate 1	0	somewhat accurate 2	4	accurate 3	35	very accurate 4	8
b.	not complete 1	1	somewhat complete 2	6	complete 3	31	very complete 4	10
c.	not useful 1	2	somewhat useful 2	10	useful 3	27	very useful 4	10
d.	not clear 1	0	somewhat clear 2	8	clear 3	33	very clear 4	8

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

5. The Artillery Commander and AS & R (Section 6).

a.	not accurate 1	0	somewhat accurate 2	3	accurate 3	35	very accurate 4	6
b.	not complete 1	2	somewhat complete 2	7	complete 3	28	very complete 4	9
c.	not useful 1	2	somewhat useful 2	10	useful 3	26	very useful 4	8
d.	not clear 1	1	somewhat clear 2	7	clear 3	32	very clear 4	6

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

7. Commander's Field Aid to AS & R Utilization (Infantry).

a.	not accurate 1	2	somewhat accurate 2	4	accurate 3	35	very accurate 4	6
b.	not complete 1	3	somewhat complete 2	8	complete 3	29	very complete 4	8
c.	not useful 1	2	somewhat useful 2	7	useful 3	30	very useful 4	10
d.	not clear 1	2	somewhat clear 2	3	clear 3	36	very clear 4	7

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

8. Commander's Field Aid to AS & R Utilization (Artillery).

a.	not accurate 1	2	somewhat accurate 2	4	accurate 3	34	very accurate 4	3
b.	not complete 1	2	somewhat complete 2	7	complete 3	28	very complete 4	6
c.	not useful 1	1	somewhat useful 2	7	useful 3	30	very useful 4	6
d.	not clear 1	2	somewhat clear 2	4	clear 3	35	very clear 4	3

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?
Please list.

Are portions of this section obsolete? _____ If so, indicate which ones.

9. Commander's Field Aid to AS & R Utilization (Armor).

a.	not accurate 1	1	somewhat accurate 2	4	accurate 3	34	very accurate 4	7
b.	not complete 1	1	somewhat complete 2	7	complete 3	30	very complete 4	8
c.	not useful 1	1	somewhat useful 2	8	useful 3	31	very useful 4	8
d.	not clear 1	1	somewhat clear 2	5	clear 3	35	very clear 4	7

What are the chief advantages of this section?

What are the main defects (e.g., errors, omissions) of this section?

Are portions of this section obsolete? _____ If so, indicate which ones.

PART II

1. How could the Commander's Guide be used? Check all that apply:

	1	2	3	4
	In your current position	In your previous position	Elsewhere in the Army *	Elsewhere in the Armed Services**
a. As a desk reference	41	34	10	4
b. To prepare instructional materials	27	25	11	2
c. As a self-training aid	40	30	13	2
d. As an aid during exercises	38	35	11	2
e. As an aid in operational settings	34	30	10	1
f. Other (please specify)				

* Please specify _____

** Please specify _____

40

2. How often do you expect to use the Commander's Guide on the average?
Circle one:

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
1 1	2 2	2 3	3 4	25 5	13 6	14 7

3. In the event of an outbreak of hostilities how often would you expect to use the Commander's Guide on the average? Circle one:

several times a week	once a week	two or three times a week	once a month	several times a year	once or twice a year	less than once a year
21 1	1 2	11 3	5 4	7 5	3 6	12 7

Who should receive the Commander's Guide? Check all that apply:

- 43 (a) All battalion and brigade commanders
- 58 (b) All G2/S2
- 42 (c) All G3/S3
- 34 (d) All MI officers
- 21 (e) Other (please specify) _____

5. Rate the usefulness of the Commander's Guide.

a. In your present position

not useful	somewhat useful	useful	very useful
16 ₁	21 ₂	18 ₃	4 ₄

b. In your previous position

not useful	somewhat useful	useful	very useful
10 ₁	15 ₂	23 ₃	7 ₄

c. Elsewhere in the Army

(Please specify) _____

not useful	somewhat useful	useful	very useful
0 ₁	7 ₂	17 ₃	14 ₄

d. Elsewhere in the Armed Services

(Please specify) _____

not useful	somewhat useful	useful	very useful
2 ₁	7 ₂	8 ₃	6 ₄

6. If the changes you have recommended to the Commander's Guide are made, how useful would it then be?

a. In your present position

not useful	somewhat useful	useful	very useful
7 ₁	16 ₂	13 ₃	5 ₄

b. In your present position

not useful	somewhat useful	useful	very useful
5 ₁	12 ₂	13 ₃	9 ₄

c. Elsewhere in the Army

(Please specify) _____

not useful	somewhat useful	useful	very useful
0 ₁	6 ₂	13 ₃	6 ₄

d. Elsewhere in the Armed Services

(Please specify) _____

not useful	somewhat useful	useful	very useful
2 ₁	5 ₂	7 ₃	2 ₄

7. What is the approximate amount of time you have spent reviewing the Commander's Guide?

_____ hours

8. Other comments. Please feel free to make remarks on topics not covered by the above questions. If you wish to amplify any of your previous answers you are encouraged to do that, also. Finally, if there are particular errors or omissions in the Commander's Guide that you haven't mentioned previously, or if you have any further changes or additions to suggest, please do so here. If more space is required, please use additional sheets.

APPENDIX B

RATERS' COMMENTS

Table B-1

Number of Raters Making Various Non-Unique
Comments on the Guide as a Whole

No. of raters	Comment
7	Guide should be geared to S2, not commander
5	AS&R assets, organization, or terms need updating
4	Guide is too detailed for commanders; should not be used by them
3	Publication is valuable aid to commanders and key staff
2	Field aid is sufficient at Bn level
2	Document is useful to personnel not familiar with AS&R

Table B-2

Number of Raters Making Various Non-Unique
Comments on Section 1 of the Guide

No. of raters	Comment
15	Good background material, broad overview, good introduction, outline
8	Useful summary of AS&R flow, intelligence cycle, interaction, relationship
5	Brief, concise, succinct
4	Too lengthy, detailed, complex
4	Presents overall system, system organization, function
3	Not aimed at Bn or Bde level
3	Too detailed for commander

Table B-3

Number of Raters Making Various Non-Unique
Comments on Section 2 of the Guide

No. of raters	Comment
24	Aircraft inventory is obsolete
16	Complete, concise guide to AS&R assets
6	Radar inventory is obsolete
5	Charts are useful, handy
5	Organizational structure has changed
3	Aircraft capability, performance factors obsolete
2	Too much detail for commander
2	CEWI Bn needs to be included
2	UGS are now called REMS
2	Assets mentioned are not really available
2	More discussion is needed on SLAR/IR

Table B-4

Number of Raters Making Various Non-Unique
Comments on Section 3 of the Guide

No. of raters	Comment
14	Gives request procedure, channels of information clearly
6	Excellent step by step guide to report preparation, explains form use
3	Each division or major command uses own format
2	Concise, clear
2	Not oriented toward Bn
2	Good background information
2	Good summary, reference for Bn/Bde S2

Table B-5

Number of Raters Making Various Non-Unique
Comments on Sections 5, 6, and 7 of the Guide

No. of raters	Comment
12	Matrices, diagrams, charts are useful
7	Good guide to assets during tactical operations and what information, guidelines to request
3	Doctrine is not current
3	Sensor or terminal capability is not current or not correct
3	Good as guide, is basic, gets down to nuts and bolts
3	Reconnaissance missions time won't be this great
2	Concise
2	Not useful for combat commander--S2 deals with these areas
2	Practical exercises are useful
2	Helps in use of rest of sections
2	Too general, obvious, intuitive
2	Repetitious

Table B-6

Number of Raters Making Various Non-Unique
Comments on the Field Aids

No. of raters	Comment
14	Concise, clear, compact
9	Pocket size is helpful
9	Equipment references are obsolete
5	Figures, charts, matrices are useful
2	Organization is obsolete
2	Too large to fit in pocket
2	Same errors as in main volume

DISTRIBUTION

ARI Distribution List

4 OASD (M&RA)
 2 HQDA (DAMI-CSZ)
 1 HQDA (DAPE-PBR)
 1 HQDA (DAMA-AR)
 1 HQDA (DAPE-HRE-PO)
 1 HQDA (SGRD-ID)
 1 HQDA (DAMI-DOT-C)
 1 HQDA (DAPC-PMZ-A)
 1 HQDA (DACH-PPZ-A)
 1 HQDA (DAPE-HRE)
 1 HQDA (DAPE-MPO-C)
 1 HQDA (DAPE-DW)
 1 HQDA (DAPE-HRL)
 1 HQDA (DAPE-CPS)
 1 HQDA (DAFD-MFA)
 1 HQDA (DARD-ARS-P)
 1 HQDA (DAPC-PAS-A)
 1 HQDA (DUSA-OR)
 1 HQDA (DAMO-RQR)
 1 HQDA (DASG)
 1 HQDA (DA10-PI)
 1 Chief, Consult Div (DA-OTSG), Adelphi, MD
 1 Mil Asst. Hum Res, ODDR&E, OAD (E&LS)
 1 HQ USARAL, APO Seattle, ATTN: ARAGP-R
 1 HQ First Army, ATTN: AFKA-OI-TI
 2 HQ Fifth Army, Ft Sam Houston
 1 Dir, Army Stf Studies Ofc, ATTN: OAVCSA (DSP)
 1 Ofc Chief of Stf, Studies Ofc
 1 DCSPER, ATTN: CPS/OCF
 1 The Army Lib, Pentagon, ATTN: RSB Chief
 1 The Army Lib, Pentagon, ATTN: ANRAL
 1 Ofc, Asst Sect of the Army (R&D)
 1 Tech Support Ofc, OJCS
 1 USASA, Arlington, ATTN: IARD-T
 1 USA Rsch Ofc, Durham, ATTN: Life Sciences Dir
 2 USARIEM, Natick, ATTN: SGRD-UE-CA
 1 USATTC, Ft Clayton, ATTN: SIFTC-MO-A
 1 USAIMA, Ft Bragg, ATTN: ATSU-CTD-OM
 1 USAIMA, Ft Bragg, ATTN: Marquat Lib
 1 US WAC Ctr & Sch, Ft McClellan, ATTN: Lib
 1 US WAC Ctr & Sch, Ft McClellan, ATTN: Tng Dir
 1 USA Quartermaster Sch, Ft Lee, ATTN: ATSM-TE
 1 Intelligence Material Dev Ofc, EWL, Ft Holabird
 1 USA SE Signal Sch, Ft Gordon, ATTN: ATSO-EA
 1 USA Chaplain Ctr & Sch, Ft Hamilton, ATTN: ATSC-TE-RD
 1 USA TSCH, Ft Eustis, ATTN: Educ Advisor
 1 USA War College, Carlisle Barracks, ATTN: Lib
 2 WRAIR, Neuropsychiatry Div
 1 DLI, SDA, Monterey
 1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-MR
 1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-JF
 1 USA Arctic Test Ctr, APO Seattle, ATTN: STEAC-PL-MI
 1 USA Arctic Test Ctr, APO Seattle, ATTN: AMSTE-PL-TS
 1 USA Armament Cmd, Redstone Arsenal, ATTN: ATSK-TEM
 1 USA Armament Cmd, Rock Island, ATTN: AMSAR-TDC
 1 FAA-NAFEC, Atlantic City, ATTN: Library
 1 FAA-NAFEC, Atlantic City, ATTN: Human Engr Br
 1 FAA Aeronautical Ctr, Oklahoma City, ATTN: AAC-44D
 2 USA Fld Arty Sch, Ft Sill, ATTN: Library
 1 USA Armor Sch, Ft Knox, ATTN: Library
 1 USA Armor Sch, Ft Knox, ATTN: ATSB-DI-E
 1 USA Armor Sch, Ft Knox, ATTN: ATSB-DT-TP
 1 USA Armor Sch, Ft Knox, ATTN: ATSB-CD-AD
 2 HQUSACDEC, Ft Ord, ATTN: Library
 1 HQUSACDEC, Ft Ord, ATTN: ATEC-EX-E-Hum Factors
 2 USAEC, Ft Benjamin Harrison, ATTN: Library
 1 USAPACDC, Ft Benjamin Harrison, ATTN: ATCP-HR
 1 USA Comm-Elect Sch, Ft Monmouth, ATTN: ATSN-EA
 1 USAEC, Ft Monmouth, ATTN: AMSEL-CT-HDP
 1 USAEC, Ft Monmouth, ATTN: AMSEL-PA-P
 1 USAEC, Ft Monmouth, ATTN: AMSEL-SI-CB
 1 USAEC, Ft Monmouth, ATTN: C, Fac Dev Br
 1 USA Materials Sys Anal Agcy, Aberdeen, ATTN: AMXSY-P
 1 Edgewood Arsenal, Aberdeen, ATTN: SAREA-BL-H
 1 USA Ord Ctr & Sch, Aberdeen, ATTN: ATSL-TEM-C
 2 USA Hum Engr Lab, Aberdeen, ATTN: Library/Dir
 1 USA Combat Arms Tng Bd, Ft Benning, ATTN: Ad Supervisor
 1 USA Infantry Hum Rsch Unit, Ft Benning, ATTN: Chief
 1 USA Infantry Bd, Ft Benning, ATTN: STEBC-TE-T
 1 USASMA, Ft Bliss, ATTN: ATSS-LRC
 1 USA Air Def Sch, Ft Bliss, ATTN: ATSA-CTD-ME
 1 USA Air Def Sch, Ft Bliss, ATTN: Tech Lib
 1 USA Air Def Bd, Ft Bliss, ATTN: FILES
 1 USA Air Def Bd, Ft Bliss, ATTN: STEBD-PO
 1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Lib
 1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: ATSW-SE-L
 1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Ed Advisor
 1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: DepCdr
 1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: CCS
 1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCASA
 1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACI-E
 1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACI-CI
 1 USAECOM, Night Vision Lab, Ft Belvoir, ATTN: AMSEL-NV-SD
 3 USA Computer Sys Cmd, Ft Belvoir, ATTN: Tech Library
 1 USAMERDC, Ft Belvoir, ATTN: STSFB-DQ
 1 USA Eng Sch, Ft Belvoir, ATTN: Library
 1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-TD-S
 1 USA Topographic Lab, Ft Belvoir, ATTN: STINFO Center
 1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-GSL
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: CTD-MS
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-MS
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TE
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEX-GS
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTS-OR
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-DT
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-CS
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: DAS/SRD
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEM
 1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: Library
 1 CDR, HQ Ft Huachuca, ATTN: Tech Ref Div
 2 CDR, USA Electronic Prgv Grd, ATTN: STEEP-MT-S
 1 HQ, TCATA, ATTN: Tech Library
 1 HQ, TCATA, ATTN: ATCAT-OP-Q, Ft Hood
 1 USA Recruiting Cmd, Ft Sheridan, ATTN: USARCPM-P
 1 Senior Army Adv, USAFAGOD/TAC, Elgin AF Aux Fld No. 9
 1 HQ, USARPAC, DCSPER, APO SF 96568, ATTN: GPPE-SE
 1 Stimson Lib, Academy of Health Sciences, Ft Sam Houston
 1 Marine Corps Inst., ATTN: Dean-MCI
 1 HQ, USMC, Commandant, ATTN: Code MTMT
 1 HQ, USMC, Commandant, ATTN: Code MPI-20-28
 2 USCG Academy, New London, ATTN: Admission
 2 USCG Academy, New London, ATTN: Library
 1 USCG Training Ctr, NY, ATTN: CO
 1 USCG Training Ctr, NY, ATTN: Educ Svc Ofc
 1 USCG, Psychol Res Br, DC, ATTN: GP 1/62
 1 HQ Mid-Range Br, MC Det, Quantico, ATTN: P&S Div

1 US Marine Corps Liaison Ofc, AMC, Alexandria, ATTN: AMCGS-F
 1 USATRADOC, Ft Monroe, ATTN: ATRO-ED
 6 USATRADOC, Ft Monroe, ATTN: ATRP-AD
 1 USATRADOC, Ft Monroe, ATTN: ATTS-EA
 1 USA Forces Cmd, Ft McPherson, ATTN: Library
 2 USA Aviation Test Bd, Ft Rucker, ATTN: STEBG-PO
 1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Library
 1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Educ Advisor
 1 USA Aviation Sch, Ft Rucker, ATTN: PO Drawer O
 1 HQUSA Aviation Sys Cmd, St Louis, ATTN: AMSAV-ZDR
 2 USA Aviation Sys Test Act., Edwards AFB, ATTN: SAVTE--T
 1 USA Air Def Sch, Ft Bliss, ATTN: ATSA TEM
 1 USA Air Mobility Rsch & Dev Lab, Moffett Fld, ATTN: SAVDL -AS
 1 USA Aviation Sch, Res Tng Mgt, Ft Rucker, ATTN: ATST-T-RTM
 1 USA Aviation Sch, CO, Ft Rucker, ATTN: ATST-D-A
 1 HQ, DARCOM, Alexandria, ATTN: AMXCD-TL
 1 HQ, DARCOM, Alexandria, ATTN: CDR
 1 US Military Academy, West Point, ATTN: Serials Unit
 1 US Military Academy, West Point, ATTN: Ofc of Milt Ldrshp
 1 US Military Academy, West Point, ATTN: MAOR
 1 USA Standardization Gp, UK, FPO NY, ATTN: MASE-GC
 1 Ofc of Naval Rsch, Arlington, ATTN: Code 452
 3 Ofc of Naval Rsch, Arlington, ATTN: Code 458
 1 Ofc of Naval Rsch, Arlington, ATTN: Code 450
 1 Ofc of Naval Rsch, Arlington, ATTN: Code 441
 1 Naval Aerosp Med Res Lab, Pensacola, ATTN: Acous Sch Div
 1 Naval Aerosp Med Res Lab, Pensacola, ATTN: Code L51
 1 Naval Aerosp Med Res Lab, Pensacola, ATTN: Code L5
 1 Chief of NavPers, ATTN: Pers-OR
 1 NAVAIRSTA, Norfolk, ATTN: Safety Ctr
 1 Nav Oceanographic, DC, ATTN: Code 6251, Charts & Tech
 1 Center of Naval Anal, ATTN: Doc Ctr
 1 NavAirSysCom, ATTN: AIR--5313C
 1 Nav BuMed, ATTN: 713
 1 NavHelicopterSubSqua 2, FPO SF 96601
 1 AFHRL (FT) Williams AFB
 1 AFHRL (TT) Lowry AFB
 1 AFHRL (AS) WPAFB, OH
 2 AFHRL (DOJZ) Brooks AFB
 1 AFHRL (DOJN) Lackland AFB
 1 HOU SAF (INYSO)
 1 HOU SAF (DPXXA)
 1 AFVTG (RDI) Randolph AFB
 3 AMRL (HE) WPAFB, OH
 2 AF Inst of Tech, WPAFB, OH, ATTN: ENE/SL
 1 ATC (XPTD) Randolph AFB
 1 USAF AeroMed Lib, Brooks AFB (SUL-4), ATTN: DOC SEC
 1 AFOSR (NL), Arlington
 1 AF Log Cmd, McClellan AFB, ATTN: ALC/DPCR B
 1 Air Force Academy, CO, ATTN: Dept of Bel Scn
 5 NavPers & Dev Ctr, San Diego
 2 Navy Med Neuropsychiatric Rsch Unit, San Diego
 1 Nav Electronic Lab, San Diego, ATTN: Res Lab
 1 Nav TrngCen, San Diego, ATTN: Code 9000-Lib
 1 NavPostGraSch, Monterey, ATTN: Code 55Aa
 1 NavPostGraSch, Monterey, ATTN: Code 2124
 1 NavTrngEquipCtr, Orlando, ATTN: Tech Lib
 1 US Dept of Labor, DC, ATTN: Manpower Admin
 1 US Dept of Justice, DC, ATTN: Drug Enforce Admin
 1 Nat Bur of Standards, DC, ATTN: Computer Info Section
 1 Nat Clearing House for MH--Info, Rockville
 1 Denver Federal Ctr, Lakewood, ATTN: BLM
 12 Defense Documentation Center
 4 Dir Psych, Army Hq, Russell Ofcs, Canberra
 1 Scientific Advcr, Mil Bd, Army Hq, Russell Ofcs, Canberra
 1 Mil and Air Attache, Austrian Embassy
 1 Centre de Recherche Des Facteurs, Humaine de la Defense Nationale, Brussels
 2 Canadian Joint Staff Washington
 1 C/Air Staff, Royal Canadian AF, ATTN: Pers Std Anal Br
 3 Chief, Canadian Def Rsch Staff, ATTN: C/CRDS(W)
 4 British Def Staff, British Embassy, Washington
 1 Def & Civil Inst of Enviro Medicine, Canada
 1 AIR CRESS, Kensington, ATTN: Info Sys Br
 1 Militaerpsykologisk Tjeneste, Copenhagen
 1 Military Attache, French Embassy, ATTN: Doc Sec
 1 Mercein Chef, C.E.R.P.A.-Arsenal, Toulon/Naval France
 1 Prin Scientific Off, Appl Hum Engr Rsch Div, Ministry of Defense, New Delhi
 1 Pers Rsch Ofc Library, AKA, Israel Defense Forces
 1 Ministeris van Defensie, DOOP/KL Afd Sociaal Psychologische Zaken, The Hague, Netherlands