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# TRAINING IN UTILIZATION OF SURVEILLANCE AND RECONNAISSANCE RESOURCES BY COMBAT ARMS OFFICERS

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and

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**BATTLEFIELD INFORMATION SYSTEMS TECHNICAL AREA**

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**September 1978**

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The purpose of this effort was to increase the effective use of aerial surveillance and reconnaissance (AS&R) resources by combat commanders through analysis of current experience and training and subsequent development of materials that may be used for training and field use.

Contemporary training materials were analyzed for content.

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20.

Questionnaires pertaining to experience with, attitudes toward, and training received relative to AS&R were distributed to students at pertinent schools, and the responses were analyzed for implications for training.

Combat Arms students receive limited training in the use of AS&R resources, and they felt they could use more information in this area. The more experience with AS&R, the more favorable has been the experience with this resource. More emphasis should be placed on practical exercises that permit appropriate interaction with the capabilities of AS&R.

The results of the analyses were used in the subsequent development of training materials and a field aid.

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**BATTLEFIELD INFORMATION SYSTEMS TECHNICAL AREA**

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## FOREWORD

The Battlefield Information Systems Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) is concerned with the human resource demands of increasingly complex battlefield systems for acquiring, transmitting, processing, disseminating, and using information. This increased complexity places greater demands on the operator using the machine system. Research in this area focuses on human performance problems related to interactions within command and control centers, as well as issues of system development. The research is concerned with such areas as software development, topographic products and procedures, tactical symbology, user-oriented systems, information management, staff operations and procedures, decision support, and sensor-systems integration and use.

An area of special concern is the efficient, effective use of surveillance and reconnaissance resources. The continued proliferation of information-gathering equipment, coupled with rapid technological change and the demands of modern warfare, have dramatically increased the complexity of the surveillance and reconnaissance system. To insure that the use of this equipment is responsive to command needs requires skilled and knowledgeable users and collection managers. The tactical commander must understand the capabilities and limitations of the surveillance and reconnaissance system. The collection manager must understand user needs and procedures for planning, coordinating, and managing this equipment. Previous ARI research (Research Report 1181) identified significant deficiencies in the ability of the G2 Air (now the Surveillance and Reconnaissance) Officer to plan and manage aerial surveillance and reconnaissance (AS&R) resources effectively.

This report describes the development of job aids to assist tactical combat commanders in effectively using AS&R resources. These job aids are being used worldwide in U.S. Army units and schools. This report was not published at the time the job aids were distributed to users because of the urgency of other requirements. Continued interest in and requests for copies of the job aids have led to this delayed publication of their development. Although some changes have occurred in terminology and doctrine since the research was conducted, the functions involved remain largely unchanged.

Research in the area of sensor systems integration and use is conducted as an in-house effort, augmented by contracts with organizations selected for their specialized capabilities and unique facilities. The present research was conducted in conjunction with personnel from the

McDonnell Douglas Corporation (contract DAHC-19-73-C-0061) under the direction of Dr. Abraham H. Birnbaum. Research in this area is responsive to general requirements of Army Project 2Q162106A721 and to special requirements of the U.S. Army Assistant Chief of Staff for Intelligence.

JOSEPH ZEIDNER
Technical Director

# TRAINING IN UTILIZATION OF SURVEILLANCE AND RECONNAISSANCE RESOURCES BY COMBAT ARMS OFFICERS

## BRIEF

Requirement:

To increase the effective use of aerial surveillance and reconnaissance (AS&R) resources by combat commanders through development of materials for training and field use.

Procedure:

Contemporary training materials were obtained and analyzed for content. Questionnaires pertaining to experience with, attitudes toward, and training received relative to AS&R were distributed to students at pertinent schools, and the responses were analyzed for implications for training. The results were used in the later development of a combat commanders guide and a field aid to AS&R use.

Findings:

Combat Arms students receive limited training in the use of AS&R resources.

More emphasis is needed on use at the battalion and brigade echelons and interaction with division and corps assets.

The more experience men have with AS&R, the more favorable has been their experience.

Combat Arms students generally felt they could use more information concerning the effective use of AS&R.

More emphasis should be placed on practical exercises in the training context that permit appropriate interaction with the capabilities of the AS&R system.

Utilization of Findings:

The Combat Commanders Guide to Aerial Surveillance and Reconnaissance Resources is used worldwide in U.S. Army schools and units for training in AS&R use. This material has also been divided into a Commanders Field Aid to Aerial Surveillance and Reconnaissance Utilization for each of the Combat Arms, in formats that enable officers to use the aids as a ready reference in formulating information requests.

TRAINING IN UTILIZATION OF SURVEILLANCE AND RECONNAISSANCE RESOURCES BY COMBAT ARMS OFFICERS

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# TRAINING IN UTILIZATION OF SURVEILLANCE AND RECONNAISSANCE RESOURCES BY COMBAT ARMS OFFICERS

## INTRODUCTION

Field commanders have appreciated for centuries the value of having information about an enemy in advance of an operation. Modern technology has allowed for the more rapid movement of forces as well as for the more rapid acquisition of advance information. One of the important means of collecting information about enemy activity, terrain, and weather is the Army aerial surveillance and reconnaissance (AS&R) system.

The AS&R system consists of all personnel and equipment required to answer in a timely manner, through aerial means, requests for information from the combat commander. AS&R system resources include the most basic mode of information collection: the airborne visual observer. This mode can provide a combat commander with a relatively immediate response to an area-limited request for information. The aerial observer sightings can be augmented by using a handheld camera and self-processing film. Another mode of AS&R information-collecting resources includes aircraft designed for surveillance and reconnaissance (OV-1B, C, and D) that are equipped with cameras, an infrared scanner, or side-looking airborne radar. Data collected in this mode usually are processed on the ground and turned into information by skilled image interpreters. More sophisticated resources consist of high performance, multisensor aircraft flown by the Air Force, Navy, or Marine Corps. Along with these resources are the personnel who man image interpretation units and G2 Air sections.

Previous research[1] conducted by the Army Research Institute, while concerned primarily with G2 Air and image interpretation personnel, showed that there was a need to develop a better understanding of the capabilities of the AS&R system and an appreciation of the G2 Air officer's role among the system users.

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[1] Youngling, E. W., Vecchiotti, R. A., Bedarf, E. W., & Root, R. T. Job Requirements of G2 Air and Image Interpreter Personnel. ARI Research Report 1181, May 1974.

In a subsequent effort,[2] an attempt was made to meet the training needs of the G2 Air officer by developing a guidebook, "AS&R Management Aids and Guidelines for Evaluating Resources (MANAGER)."[3] The guide was intended for use by G2 Air officers as on-the-job training and guidance in performing their duties as asset managers.

Improvement in system use, however, concerns the user as well as the supplier of information. Research was needed on bridging the gap between user and supplier of AS&R information to make the system more effective. The commander's AS&R requirements and expectations may not be satisfied because of inappropriate use or lack of use of the system. The commander might lose confidence in the system and rely on other sources of information, even when the AS&R system could best provide the information.

Therefore, it is necessary to provide materials that foster a good understanding of the capabilities and limitations of the system. Then a field commander may establish in his own mind a realistic determination of when to use the system and what to expect from it.

## OBJECTIVES

Objectives of this study focus on providing training materials to commanders of infantry, armor, and artillery units so they may better understand and use the AS&R system. The objectives were the following:

1. To summarize and analyze the experiences of and training given to Combat Arms officers relative to the use of AS&R resources, with the purpose of identifying areas where improvements in training may lead to improvements in system use.

2. To conceptualize and evolve experimental training materials and/or methods that will increase the probability of more effective use of the AS&R system by Combat Arms officers.

3. To explore the possibility of developing aids that might supplement training and be used on the job for increased effectiveness of AS&R use.

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[2] Vecchiotti, R. A., Berrey, J. L., & Bedarf, E. W. Development of Resource Management Materials for the G2 Air Officer. ARI Technical Paper 333, 1978.

[3] Available from the Army Research Institute.

## ACQUISITION OF INFORMATION

### Curriculum Content Analysis

Initially, lesson plans and supplementary instructions pertaining to AS&R were obtained from the three combat arms schools and the Command and General Staff College. Schools providing training materials were the Field Artillery School, Fort Sill, Okla.; Armor School, Fort Knox, Ky.; Infantry School, Fort Benning, Ga.; and the Command and General Staff College, Fort Leavenworth, Kans. Although not all training materials were available, substantive information, relative to proportion and content of AS&R training, was provided.

The curriculum content analysis was based on a comparison of the materials obtained against a baseline AS&R subject-matter list. This list, shown in the left-hand column in Figure 1, was derived from reviewing the air intelligence system, functional-flow diagrams, and the functional-task list developed for "AS&R MANAGER." Additionally, field manuals related to maneuver and firepower requirements also were reviewed and integrated by experts into the final list shown in Figure 1.

Entries in the curriculum content analysis were based on judgments made after a thorough review of the training materials supplied. The entries are not judgments of the quality of training as much as they are indications of how well the content areas match a best judgment of which AS&R content areas impact on the commander's needs. Areas where additional content should be provided were considered in the subsequent development of experimental training materials.

In general, results of the curriculum content analysis across all schools indicated that AS&R information was a small portion of a larger segment on intelligence and intelligence support except for the Command and General Staff College, where a more substantial treatment of AS&R was found. Intelligence and AS&R materials may have been covered also in other phases of instruction but were not included in this analysis.

Another finding of the analysis concerns the probable focus of attention on the training materials. The analysis led to the conclusion that more attention needed to be focused at the battalion and brigade levels in terms of their use of all the AS&R resources available. Much emphasis was placed on division and corps AS&R assets, whereas the relationship between lower echelons and the division AS&R resources was treated inadequately.

### Questionnaire Development

Another objective of collecting information relative to the use of AS&R information was a determination of the experiences and opinions of combat commanders as to what the system can do for them and how it can be improved. Questionnaires were developed for this aspect of data collection.

NOTE: THESE EVALUATIONS WERE MADE ONLY WITHIN THE SCOPE OF THIS EFFORT**

LEGEND
1 = IN DEPTH COVERAGE
2 = ADDRESSES SUBJECT
3 = CAN BE EXPANDED

| AERIAL SURVEILLANCE AND RECONNAISSANCE SYSTEM PROFILE* | US ARMY FIELD ARTILLERY SCHOOL, FORT SILL, OKLAHOMA | | | | | | | | | US ARMY ARMOR SCHOOL FORT KNOX, KENTUCKY | US ARMY INFANTRY SCHOOL FORT BENNING, GEORGIA | US ARMY COMMAND AND GENERAL STAFF COLLEGE FORT LEAVENWORTH, KANSAS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | INSTRUCTORS MANUSCRIPT | | | REFERENCE NOTES | | | | | | INSTRUCTORS ... MANUSCRIPT | REFERENCE | LESSON PLAN | | | | | OTHER*** READING |
| | TARGET ACQUISITION FROM AERIAL IMAGERY TA-4220, IC, 3 PERIODS, FEB 73 PRESENTED TO: FAOAC, FATAOC | AIR-GROUND OPERATIONS T-12 - IN JAN 72 PRESENTED TO FAOAC | TACTICAL AIR RECONNAISSANCE T-1246 2 PD MAY 72 | FIRE SUPPORT COORDINATION T3200, T3201, T3205, T3208, T3346, T3414, T3416, RN MAR 71 | ORGANIZATION AND EMPLOYMENT OF ARMY AVIATION, TAO IDE TB-DB JUNE 73 | AIR-GROUND OPERATIONS T1242 T1243, T1244, T1260, T1261, T1262, T1266 RN MAY 71 | TACTICAL AIR OPERATIONS - TACTICAL AIR RECONNAISSANCE, TF BIBC (T1246) RN APRIL 73 | AIR FORCE REFERENCE NOTE, A GUIDE FOR THE ARTILLERYMAN, T12 RN AUG 71 | COMBAT SURVEILLANCE PLANNING SC.60503 | INTELLIGENCE HANDBOOK ST 7-151 FY72 | TACTICAL AIR SUPPORT M6010/4, R6010/4, , 1973-1974 | INTELLIGENCE /OPERATIONS M1107-1/4, R1107-1/4 | STAMO PLANNING R0630/3, M5630/3 | INTELLIGENCE/OPERATIONS M1107-2/4, R1107-2/4 | INTELLIGENCE OPERATIONS APPENDIX 1 - M1107-1, R1107-1 AND M1107-2, R1107-2 (2 DOCUMENTS) | INTELLIGENCE /OPERATIONS APPENDIX 2 - M1107-1, R1107-1 |
| **ASSETS** | | | | | | | | | | | | | | | | | |
| PERSONNEL (GENERAL) | **** | | 2 | | | | | | | 2 | | 2 | 2 | 2 | | | |
| G2/S2 SECTION | | | | 2 | | | | | | | 1 | | | | 1 | | 1 |
| G2 AIR | | | | 2 | 2 | | | | | | 2 | | | | | | 2 |
| G2 AIR BRANCH (II) | | | | | | | | | | | 2 | | | | | | 2 |
| MIBARS | 2 | | | | | | | | | | | | | | 2 | | 1 |
| AIRCRAFT (GENERAL) | | | | | | | | | | | 2 | | | 2 | | | |
| DIVISION | 2 | 3 | | | 1 | | | | | 2 | | | | | 1 | | |
| CORPS | 3 | | | | | | | | | | | | | | | | 1 |
| OTHER AS&R SUPPORT | | 1 | 2 | 2 | | | 2 | 2 | | | | | | | | | |
| SENSORS (GENERAL) | | | 2 | | | | 2 | 2 | | | 2 | | | 2 | 1 | | 2 |
| VISUAL | | | 2 | | | 2 | | | | 2 | | | | 2 | | | |
| OPTICAL | 3 | | 3 | | | 2 | | | | 2 | | | | | | | |
| IR | 3 | | | | | 2 | | | | 2 | | | | | | | |
| SLAR | 3 | | 3 | | | 2 | | | | 2 | | | | | | | |
| OTHER AERIAL SENSORS | | | | | | | | | | | | | | | | | |
| GROUND BASED | | | | | | | | | | | | | | | | | |
| GROUND DATA TERMINALS | 2 | | | | | | | | | | | | | | | | |
| **SURVEILLANCE & RECONNAISSANCE MISSION PARAMETERS** | | | | | | | | | | | | | | | | | |
| PREPLANNED | | | | | | | | | | | | | | | | | |
| VISUAL | | | | | | | | | | | | | | | | | |
| SENSOR | | | | | | | | | | | | | | | | | |
| IMMEDIATE | | | | | | | | | | | | | | | | | |
| VISUAL | | | | | | | | | | | | | | | | | |
| SENSOR | | | | | | | | | | | | | | | | | |
| WEATHER (GENERAL) | | | | | | | | | | | | | 2 | | | | 1 |
| OPERATIONAL | | | | | | | | | | | | | | | | | |
| MARGINAL | | | | | | | | | | | | | | | | | |
| NONOPERATIONAL | | | | | | | | | | | | | | | | | |
| TERRAIN | | | | | | | | | | | | | | | | | |
| FLAT | | | | | | | | | | | | | | | | | |
| ROLLING | | | | | | | | | | | | | | | | | |
| MOUNTAIN | | | | | | | | | | | | | | | | | |
| TARGET | | | | | | | | | | | | | | | | | |
| FLEETING | | | | | | | | | | | | | | | | | |
| FIXED | | | | | | | | | | | | | | | | | |
| **PRODUCTS** | | | | | | | | | | | | | | | | | |
| INITIAL PHOTO COVERAGE | | | | | | | | | | | | | | | | | |
| SPECIAL STUDIES | | | | | | | | | | | | | | | | | |
| II REPORTS (GENERAL) | 2 | | 2 | | | 2 | | | | | 2 | | | | 2 | | |
| IPIR | 2 | | 2 | | | 2 | | | | | | | | | | | |
| SUPIR | 3 | | | | | | | | | | | | | | | | |
| UPIR | | | | | | | | | | | | | | | | | |
| BIIB | | | | | | | | | | | | | | | | | |
| BIIR | | | | | | | | | | | | | | | | | |
| IMSREP | 2 | | | | | | | | | | | | | | | | |
| HOT PHOTO REP | 2 | | 3 | | | | | | | | | | | | | | |
| INFLIGHT REPORTS | 1 | | | | | 2 | | | | | | | | | | | |
| SPECIAL REPORTS | | | | | | | | | | | | | | | | | |
| **INFORMATION REQUEST** | | | | | | | | | | | | | | | | | |
| REQUEST FORM | | | | 3 | | 3 | | | | | | | | | | | |
| REQUEST CHANNEL | | 1 | 2 | 2 | | | | | | | | 1 | | | | | |
| REPORT DISSEMINATION | | | | | | | | | | | | | | | | | |
| **GENERAL** | | | | | | | | | | | | | | | | | |
| ARMY AS&R | | | | | | | | | | | | | | | | | |
| USAF AS&R OR SUPPORT | | | | 1 | | | 1 | 1 | | | | | | | | | |
| ARMY AIRCRAFT CAPABILITY | | | | | 1 | 1 | | | | | | | | | | | |

*ONLY THOSE SUBJECTS RELEVANT TO AS&R ARE USED.
**ONLY THOSE MATERIALS RECEIVED WERE ANALYZED. SCHOOLS MAY HAVE OTHER MATERIALS IN USE BUT NOT AVAILABLE TO THIS STUDY.
***ONE UNIT OF INSTRUCTION CONCERNING USAF RECONNAISSANCE IS ALSO PRESENTED TO THE STUDENTS. (NOT AVAILABLE)
****A BLANK SPACE MEANS SUBJECT AREA NOT INCLUDED IN MATERIALS RECEIVED.

**FIGURE 1. CURRICULUM CONTENT ANALYSIS**

A questionnaire was prepared that covered the following areas of interest: biographical information, field experience, aerial intelligence use, training in AS&R, and knowledge of AS&R capability. The questionnaire used primarily multiple-choice questions, but provided for responses to be supplemented by written comments. Questionnaires were sent to the following schools: Infantry School, Armor School, Field Artillery School, Intelligence School, Command and General Staff College, and the Army War College.

The rationale for selecting branch schools and senior service schools was to sample officers both with and without AS&R experience. At branch schools, the advanced course was used as the sample; at the Command and General Staff College and the Army War College, the questionnaires were distributed to students who were members of the Infantry, Armor, Field Artillery, or Intelligence Branches. In most cases, distribution was made after students had completed the intelligence portion of the syllabus to assure that most had some training in the area. Thus, questionnaires were designed for persons with experience, with no experience, and with some AS&R training. The Intelligence School was selected to include a population of potential G2's or G2 Air officers to complete the link between commander and the AS&R system.

A total of 2,100 questionnaires were mailed to the selected formal schools; 84% or 1,765 questionnaires were returned. Data reduction of objective responses was accomplished by using a separate answer sheet which was optically scanned. Data summaries were obtained by a computer program applied to the questionnaire results. The significant return rates for each school were encouraging and indicated that a representative sample of the population of potential AS&R users was obtained. Table 1 shows the percentages of completed returns by school.

Table 1

Percentage of Questionnaire Returns by School

| School | Total mailed | Total completed | Percent completed |
|---|---|---|---|
| Infantry | 700 | 664 | 94 |
| Armor | 300 | 290 | 97 |
| Field Artillery | 425 | 351 | 83 |
| Intelligence | 275 | 186 | 68 |
| Command and General Staff College | 200 | 135 | 68 |
| Army War College | 200 | 116 | 58 |

## Questionnaire Results

Sample Characteristics and Experience. The questionnaire initially dealt with the general and specific experience of the sample. Table 2 shows the responses to the question of which positions respondents had occupied: command or staff. The distribution is given for all the respondents and for those attending each school.

In addition to finding out which positions they may have been exposed to in the AS&R system, a series of questions was asked concerning specific experiences in terms of incidence and pattern of use of the AS&R system. The distribution of responses to these questions is shown in Table 3. It may be noted that the percentage of the sample that had used the system or had frequently used the system is noticeably larger for the samples at the senior service schools (Command and General Staff College and War College). These results may reflect the greater experience and higher levels of responsibility represented in the senior service samples.

Table 4 shows the distribution of responses to questions dealing with specific system use. Once again, it appears that respondents at the senior schools differed in their pattern of experience as a function of their general overall higher level of experience. A greater proportion of these respondents had requested visual observation frequently, found it useful to view imagery, and requested information from other than the S2/G2. Also, a greater proportion of these respondents had specified the particulars of an AS&R mission. However, this proportion is still relatively small, about 20% as opposed to about 10% at the service schools. Overall, about 50% of the respondents had never specified the particulars of a mission. With respect to naming a specific report, about 25% of the samples from the senior schools had done so.

A series of questions attempted to elicit the pattern of experience with the adequacy of the system's response and general interaction with the system in terms of situations respondents had encountered. Table 5 shows the pattern of responses to the particular situations stated. Table 5 also gives responses for those requesting air reconnaissance support frequently and those requesting such support infrequently. (Responses categorized by location are given in Table B-1 in Appendix B.) The pattern of interaction and experience with the system appears to change, resulting from the overall incidence of system use. This situation is reflected in different patterns as a function of respondents indicating different degrees of system use (Table 5), or as a function of the sample involved (Table B-1), which may be correlated with experience.

The experience occurring most frequently involved requesting, and frequently receiving, the information requested. For those who, overall, had frequently used the system, this was the situation reported by about 60% of the respondents, whereas this was the situation reported by about 20% of those using the system infrequently.

Table 2

Percentage of Prior Occupancy of Command and Staff Positions

| Position | Sample | | | | | | |
|---|---|---|---|---|---|---|---|
| | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Commander of infantry unit | .34 | .55 | .23 | .05 | .18 | .35 | .49 |
| Commander of armor unit | .09 | .02 | .30 | .01 | .10 | .20 | .18 |
| Commander of field artillery unit | .16 | .01 | .01 | .55 | .06 | .19 | .31 |
| Commander of combat engineering unit | .02 | .01 | .01 | .00 | .01 | .09 | .11 |
| Army Aviator | .32 | .34 | .51 | .35 | .09 | .15 | .10 |
| S2 | .21 | .19 | .13 | .20 | .35 | .30 | .21 |
| S2 Air | .02 | .02 | .02 | .01 | .04 | .02 | .01 |
| S3 | .31 | .28 | .24 | .31 | .18 | .52 | .69 |
| S3 Air | .16 | .22 | .18 | .05 | .07 | .26 | .13 |
| G2 | .02 | .01 | .01 | .01 | .08 | .03 | .04 |
| G2 Air | .01 | .00 | .01 | .01 | .05 | .01 | .03 |
| Assistant G2 Air | .02 | .01 | .00 | .01 | .06 | .02 | .02 |
| G3 | .03 | .03 | .01 | .02 | .02 | .03 | .13 |
| Aviation Officer | .11 | .14 | .09 | .14 | .03 | .07 | .06 |
| ARVN adviser | .23 | .23 | .16 | .13 | .25 | .50 | .44 |
| Any of above in combat? | .67 | .70 | .72 | .54 | .48 | .91 | .81 |

Note. Figures show proportion of respondents indicating they had occupied indicated positions.

Table 3

Incidence of Prior Use of AS&R

| Question | Response Selected | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| In whatever capacity, have you ever had to utilize the AS&R capability available to you to support your field operations? | Yes[a] | .61 | .59 | .59 | .49 | .63 | .80 | .92 |
| To what extent have you ever requested air reconnaissance support during any of your operations? | Frequently | .32 | .32 | .34 | .18 | .34 | .48 | .60 |
| | Infrequently | .31 | .33 | .30 | .28 | .28 | .33 | .32 |
| | Never | .37 | .35 | .36 | .54 | .37 | .19 | .08 |
| Have you ever requested the establishment of an aerial surveillance program . . . ? | Yes[b] | .20 | .19 | .17 | .11 | .22 | .29 | .49 |
| Have you ever participated in a training exercise which involved utilization of AS&R capabilities outside of formal school training? | Yes[a] | .38 | .37 | .37 | .29 | .32 | .48 | .73 |

Note. Figures indicate proportion of selected responses to questions.

[a]Alternative responses available were "No" and "Not sure."

[b]Alternative response available was "No."

Table 4

Incidence of Specific Use of AS&R

| Question | Response | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| To what extent have you requested visual observation from Army aircraft in support of your field operations? | Frequently | .39 | .39 | .41 | .24 | .35 | .60 | .70 |
| | Infrequently | .28 | .29 | .21 | .34 | .28 | .24 | .18 |
| | Never | .22 | .21 | .25 | .30 | .20 | .13 | .10 |
| | N/A | .11 | .11 | .12 | .12 | .17 | .03 | .01 |
| To what extent have you specified the particulars of an AS&R mission relative to sensors and aircraft used? | Frequently | .12 | .11 | .12 | .08 | .18 | .19 | .22 |
| | Infrequently | .20 | .21 | .18 | .16 | .17 | .25 | .29 |
| | Never | .52 | .53 | .56 | .57 | .43 | .48 | .45 |
| | N/A | .16 | .15 | .14 | .19 | .22 | .08 | .04 |
| To what extent did you find it more useful to view imagery to receiving an AS&R report? | Frequently | .08 | .07 | .07 | .04 | .13 | .12 | .18 |
| | Infrequently | .16 | .14 | .15 | .12 | .17 | .24 | .32 |
| | Never | .28 | .31 | .28 | .25 | .22 | .27 | .27 |
| | N/A | .48 | .47 | .50 | .59 | .47 | .37 | .23 |
| Did you ever request AS&R information from anyone other than the S2/G2? | Yes | .16 | .12 | .13 | .10 | .21 | .24 | .39 |
| | No | .37 | .39 | .40 | .33 | .33 | .40 | .39 |
| | Can't say | .12 | .15 | .10 | .10 | .09 | .16 | .15 |
| | N/A | .35 | .33 | .38 | .47 | .36 | .31 | .07 |
| --did you request any specific reports or reports such as a hot photo report . . . ? | Yes | .11 | .09 | .09 | .06 | .17 | .24 | .26 |
| | No | .34 | .35 | .37 | .31 | .30 | .37 | .37 |
| | Can't say | .13 | .16 | .08 | .09 | .09 | .15 | .26 |
| | N/A | .42 | .40 | .46 | .54 | .44 | .24 | .11 |

Note. Figures indicate proportion of selected responses to questions.

Table 5

Incidence of Experiences with AS&R
(total sample)

| Situation | Respondents frequently requesting air reconnaissance support | | | Respondents infrequently requesting air reconnaissance support | | |
|---|---|---|---|---|---|---|
| | Response | | | Response | | |
| | Frequently | Infrequently | Never | Frequently | Infrequently | Never |
| I requested information which I knew stretched the capability of the AS&R system and received the requested information. | .07 | .30 | .41 | .01 | .13 | .43 |
| I requested information of the AS&R system and received the information I requested | .59 | .19 | .06 | .18 | .32 | .11 |
| I requested information of the AS&R system but did not receive any. | .06 | .44 | .31 | .03 | .24 | .31 |
| I requested information of the AS&R system and received information of little use, i.e., not timely, incomplete and inaccurate. | .12 | .49 | .18 | .06 | .28 | .23 |
| I did not know what to expect from the AS&R system and did not make any requests. | .03 | .14 | .33 | .10 | .12 | .22 |
| I knew the AS&R system could not deliver the information I needed, therefore, I did not make any requests. | .05 | .18 | .31 | .04 | .11 | .24 |

Note. Figures indicate proportion of responses to situations.

For those using the system frequently, 30% of the respondents indicated that on infrequent occasions, they had stretched the capability of the system but yet had received the requested information. This was the case with 13% of the infrequent users. Frequent incidents involving not receiving requested information or receiving information of little use did not involve a large proportion of the responses (about 10% for the frequent users and 5% for the infrequent users).

However, infrequent occurrence of such incidents did increase noticeably as a function of overall frequency of use, with about 45% of the responses falling in this category for the frequent users and 25% for the infrequent users. A low proportion of the responses (about 10%) was elicited for those situations in which the respondent did not make requests because of not knowing what to expect, or did not expect the system to meet the information requirements.

The pattern of responses in Table 5 generally indicates that the more familiar the respondents were with the system, the more favorable were their experiences with the system. It is impossible to determine if greater use of the system was a result of favorable experiences based on having used the system, or if the greater incidence of favorable incidents is simply because of greater system use. The more frequent use by students in the senior schools would indicate the latter to be the case (Table 3).

However, it would appear desirable, in any case, for the user to interact with the system in such a manner as to permit the system to respond in as appropriate a manner as possible. If there is an appropriate interaction, the more frequent the use of the system, the more favorable the results, and the greater the inclination to use the system on a subsequent occasion. This pattern suggests a need to provide greater opportunity for interaction with the system during training.

Attitudinal Responses. In addition to finding out the experiences that respondents had had with the AS&R system, the questionnaire revealed attitudes or feelings held toward the system. Such attitudes might be developed through direct experience with the system, training, or indirect experience through the opinions of others. The respondents had been exposed to all three influences in various degrees. As seen in Table 3, the percentage of respondents who had not used the system ranged from 8% for those respondents at the Army War College to 54% for those at the Field Artillery School.

Table 6 shows the pattern of responses to a question concerning the adequacy of the system to satisfy needs. The data are presented as a function both of the location of the samples and the degree of system use.

Table 6

Responses to Question on Adequacy of the AS&R System to Satisfy Needs[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Adequate | Frequent | .43 | .40 | .42 | .31 | .61 | .42 | .51 |
| | Infrequent | .26 | .25 | .17 | .33 | .43 | .21 | .15 |
| | Never | .20 | .13 | .16 | .23 | .34 | .21 | .33 |
| | All | .29 | .26 | .25 | .27 | .46 | .31 | .38 |
| Marginal | Frequent | .26 | .23 | .18 | .42 | .16 | .33 | .37 |
| | Infrequent | .21 | .19 | .25 | .22 | .16 | .21 | .33 |
| | Never | .09 | .11 | .05 | .12 | .06 | .13 | .00 |
| | All | .19 | .17 | .15 | .20 | .12 | .25 | .36 |
| Inadequate | Frequent | .06 | .09 | .05 | .06 | .04 | .05 | .07 |
| | Infrequent | .10 | .11 | .13 | .09 | .09 | .12 | .00 |
| | Never | .07 | .08 | .05 | .07 | .03 | .17 | .00 |
| | All | .08 | .09 | .07 | .07 | .05 | .10 | .04 |
| Can't say | Frequent | .24 | .28 | .35 | .21 | .19 | .19 | .04 |
| | Infrequent | .42 | .45 | .45 | .36 | .33 | .45 | .47 |
| | Never | .64 | .69 | .74 | .57 | .57 | .50 | .67 |
| | All | .44 | .48 | .52 | .45 | .37 | .34 | .22 |

Note. Figures indicate proportion of selected responses.

[a]"Based on what you know the capability of the AS&R system to be, do you feel it is adequate in satisying your needs as a commander or staff officer?"

[b]Based on response to question, "To what extent have you ever requested air reconnaissance support during any of your operations?"

A large proportion (44%) of the respondents answered "Can't say" to this question, with the proportion decreasing sharply as a function of having had experience with the system, which indicates the importance of experience in forming attitudes. For those who had never used the system, the proportion giving this answer ranged from 50% at Command and General Staff College to 74% at Armor School. Up to 45% of those respondents who had infrequently requested air reconnaissance support felt they could not express a feeling, and up to 35% who had frequently used air reconnaissance support chose this option. Only 4% of the frequent users at the Army War College decided they could not express an opinion concerning adequacy.

For those who had never requested air reconnaissance support but did express a feeling concerning its adequacy, the trend definitely was to indicate it as "adequate" as opposed to "marginal" or "inadequate." For those who had had experience with the system, there was a similar trend, with a much more pronounced tendency toward "adequate" responses for those who had frequent experience with the system. About 50% of the responses fell in this category, ranging from 31% at Artillery School to 61% at the Intelligence School. Once again these results indicate that increased exposure to the system appears to be correlated with a more favorable attitude toward the system.

Table 7 presents the pattern of responses to a question concerning feelings about the system but related to the sufficiency of the personnel and available equipment. A similar pattern to that shown in Table 6 was found. A noticeably greater proportion of "Can't say" responses, however, was elicited by this question. This proportion may be attributed to the fact that an appropriate response to this question requires a greater knowledge of the components of the system than the previous question, which dealt with feelings about the adequacy of the system.

Similar patterns of responses were obtained to questions concerning the responsiveness of the system in terms of timeliness, accuracy, and completeness. About 50% of respondents did not care to express an opinion, with the proportion decreasing as a function of experience with the system.

A definite positive correlation existed between perception of adequacy of the system with respect to these three aspects and degree of experience with the system. These patterns of responses are presented in Tables B-2, B-3, and B-4 in Appendix B.

Two other questions dealt with the capability of the AS&R system for satisfying the targeting needs of field artillery units and for satisfying the needs of armor units. (The responses to these questions are shown in Tables B-5 and B-6, respectively, in Appendix B.) In both cases, a large proportion--an average of 60%--responded "Can't say" to the questions.

Table 7

Responses to Question on Adequacy of Personnel and Equipment Available to AS&R System[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Sufficient | Frequent | .36 | .33 | .31 | .36 | .46 | .36 | .43 |
| | Infrequent | .29 | .30 | .25 | .25 | .39 | .22 | .23 |
| | Never | .15 | .08 | .08 | .20 | .27 | .26 | .33 |
| | All | .26 | .23 | .21 | .24 | .37 | .29 | .36 |
| Marginal | Frequent | .19 | .16 | .12 | .34 | .17 | .20 | .19 |
| | Infrequent | .13 | .11 | .11 | .18 | .14 | .10 | .14 |
| | Never | .05 | .04 | .06 | .05 | .06 | .00 | .00 |
| | All | .12 | .10 | .10 | .14 | .12 | .13 | .17 |
| Insufficient | Frequent | .08 | .10 | .06 | .02 | .09 | .07 | .13 |
| | Infrequent | .06 | .06 | .05 | .06 | .07 | .07 | .06 |
| | Never | .05 | .04 | .01 | .09 | .05 | .04 | .00 |
| | All | .07 | .07 | .04 | .07 | .07 | .06 | .10 |
| Can't say | Frequent | .37 | .41 | .51 | .28 | .28 | .38 | .25 |
| | Infrequent | .53 | .53 | .58 | .51 | .40 | .61 | .57 |
| | Never | .75 | .84 | .84 | .66 | .61 | .70 | .67 |
| | All | .56 | .60 | .65 | .55 | .43 | .52 | .38 |

Note. Figures indicate proportion of selected responses.

[a]"Do you feel, from what you know of the AS&R system, that the personnel and equipment assets available to it are sufficient to satisfy your particular needs in an operational environment?"

[b]Based upon responses to question, "To what extent have you ever requested air reconnaissance support during any of your operations?"

On the question relating to field artillery, 35% of the respondents attending the Field Artillery School, as opposed to 61% for all respondents, chose not to express an opinion, with the proportion declining with experience. Of those willing to express an opinion, the responses were about evenly divided as to whether the capability was limited.

For the question pertaining to armor units, 58% of the respondents attending Armor School chose not to express an opinion, as opposed to 62% for all respondents. Of those willing to express an opinion, 32% disagreed with the statement, and 8% agreed.

For both questions, this trend appears to hold for all respondents, with a more definite rejection of a limited capability with respect to armor needs. It should be noted that the interpretation of what was meant by "limited" may have caused some difficulty in responding to this question. Also, the perception of what the system was may have varied in these particular cases. Note that the sample at the Field Artillery School had had the least experience with the system (Table 3).

Understanding of the Role of the G2 Air Officer. The G2 Air officer serves as the interface between the commander and staff and the AS&R system. A series of questions was asked to ascertain respondents' understanding of the central role of the G2 Air officer.

A list of functions that might be performed by a G2 Air officer was presented; respondents were asked to indicate agreement or disagreement with the function. Most functions had been drawn from Army Field Manual 30-20, Aerial Surveillance and Reconnaissance--Field Army; the pattern of responses is in keeping with this manual. The functions and the proportion of respondents in agreement are shown in Table 8. In general, the responses reflect a willingness to leave details of the acquisition of information to the G2 Air expert.

Bypassing the G2 was accepted by about half the respondents, with 72% of those at the Army War College in agreement. Interesting findings concern hard-copy photos and who initiates the AS&R mission request. A problem in the field in terms of using AS&R is the time-consuming process of providing hard-copy imagery along with reports.

Students from the senior schools agreed with students responding from the Intelligence School; Combat Arms Branch students, for the most part, preferred hard-copy verification. This preference may reflect differences in level of detail required or level of reliance on the G2 Air officer. It may simply be necessary to increase reliance on the G2 Air reports through training at the advanced school level.

The item dealing with responsibility for initiating AS&R mission requests has a similar reversal in responses as a function of school sample.

Table 8

Responses to Questions on the Role of the G2 Air Officer

| Statement | Sample[a] | Proportion of "Agree" responses |
|---|---|---|
| The G2 Air officer should: | | |
| Coordinate the tasking of available Aerial Surveillance and Reconnaissance (AS&R) support with organic Army, Air Force, Navy, and Marine units. | T | .89[b] |
| | I | .87 |
| | A | .83 |
| | At | .93 |
| | It | .92 |
| | C | .92 |
| | W | .94 |
| Coordinate preplanned missions between all echelon G2 Air or S2 Air (independently operating battalion) officer. | T | .85 |
| | I | .81 |
| | A | .86 |
| | At | .84 |
| | It | .91 |
| | C | .89 |
| | W | .93 |
| Coordinate aerial reconnaissance activities with artillery units. | T | .79 |
| | I | .73 |
| | A | .81 |
| | At | .81 |
| | It | .90 |
| | C | .78 |
| | W | .90 |
| Coordinate with G3 Air on the utilization of organic or direct support nonreconnaissance aircraft missions of high priority. | T | .81 |
| | I | .80 |
| | A | .81 |
| | At | .82 |
| | It | .83 |
| | C | .78 |
| | W | .89 |
| Approve or disapprove AS&R requests from elements and staff at the same echelon. | T | .59 |
| | I | .53 |
| | A | .58 |
| | At | .64 |
| | It | .71 |
| | C | .64 |
| | W | .47 |

Table 8 (Continued)

| Statement | Sample[a] | Proportion of "Agree" responses |
|---|---|---|
| Supervise the employment of Military Intelligence Battalion (Aerial Reconnaissance Support) [MIB(ARS)]. | T | .66 |
| | I | .63 |
| | A | .62 |
| | At | .74 |
| | It | .67 |
| | C | .70 |
| | W | .63 |
| Disseminate intelligence resulting from aerial surveillance operations. | T | .87 |
| | I | .84 |
| | A | .88 |
| | At | .91 |
| | It | .90 |
| | C | .84 |
| | W | .91 |
| Send information directly to the user and bypass the G2 when the information is required within a critical time period. | T | .54 |
| | I | .49 |
| | A | .57 |
| | At | .54 |
| | It | .59 |
| | C | .92 |
| | W | .94 |
| Provide hard-copy imagery to accompany each AS&R report to the requester/user. | T | .55 |
| | I | .59 |
| | A | .66 |
| | At | .61 |
| | It | .37 |
| | C | .41 |
| | W | .43 |
| Selection of the best airborne sensor system should be left up to the officer requesting information of the AS&R system, not the G2 Air. | T | .09[c] |
| | I | .10 |
| | A | .08 |
| | At | .10 |
| | It | .05 |
| | C | .04 |
| | W | .03 |

Table 8 (Continued)

| Statement | Sample[a] | Proportion of "Agree" responses |
|---|---|---|
| Selection of the best aircraft to carry out surveillance and reconnaissance missions should be left up to the officer requesting information of the AS&R system, not the G2 Air. | T | .05 |
| | I | .08 |
| | A | .05 |
| | At | .04 |
| | It | .03 |
| | C | .03 |
| | W | .02 |
| The G2 Air officer or S2 Air officer (independently operating battalion) is charged with the responsibility for initiating the request for AS&R missions. | T | .38 |
| | I | .40 |
| | A | .34 |
| | At | .38 |
| | It | .39 |
| | C | .33 |
| | W | .34 |
| Combat commanders should override any changes by the G2 Air to the request in terms of scale, type of camera, and area coverage when requesting a photographic mission. | T | .16 |
| | I | .19 |
| | A | .15 |
| | At | .14 |
| | It | .09 |
| | C | .15 |
| | W | ..18 |

[a]Sample code: T - Total; I - Infantry School; A - Armor School; At - Artillery School; It - Intelligence School; C - Command and General Staff College; W - Army War College

[b]A second alternative response to this and subsequent statements was "Disagree."

[c]A third alternative response to this and subsequent statements was "Can't say."

The issue here is the difference between a request for information and an AS&R mission request. A request for information does not necessarily initiate a mission request. Senior students with formal school training seemed to express, in open-ended comments, a confusion between the request for information and the mission request. This confusion may account for the observation that more senior officers feel the G2 Air/S2 Air officer does not initiate a mission request; the commander does. The finding was tempered by the word "initiate" in the question itself. This issue, however, was addressed in the materials prepared under this study.

Exercises. As another approach to assessing the respondents' understanding of AS&R, practical exercises were prepared representing typical situations where commanders would use AS&R resources. The six items were selected to indicate whether a respondent knew how the system operated. The exercises are given in Appendix A. Results from four schools are shown in Table 9.

Table 9

Distribution of Correct Responses as a Function of Formal School Training

| | Exercise | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| School | Correct response distribution | | | | | |
| Infantry | X | X | X | X | X | X |
| Armor | X | X | X | X | X | X |
| Artillery | X | O | X | X | X | X |
| Command and General Staff College | X | O | X | X | X | X |

Note. X = majority of those who responded selected correct response.
O = majority did not select correct response.

For the most part, respondents understood how the AS&R system operated for selected situations. In certain cases, alternate responses were given by a near majority of respondents. These cases, in all probability, were chosen because the capability of a particular airborne sensor was not known.

Respondents suggested, by their answers, that they had an adequate understanding of how the system should work. Several procedural points needed clarifying, however, for improved interaction between commanders and their intelligence resources. The questionnaire results formed a basis for determining several areas of emphasis in the subsequent development of the training materials.

AS&R Training Assessment. The remaining tables in this report show the distribution of responses to questions eliciting opinions on training in AS&R subject areas.

As shown in Table 10, about 50% of the total sample felt that much of their knowledge came from on-the-job training and experience rather than from formal school training. The proportion increases markedly as a function of experience with the AS&R system. For example, 80% of those at Command and General Staff College who frequently used the system indicated this to be the case. Thus, either the training in schools should be given more emphasis, or more attention should be given to facilitating on-the-job training or both. Then, the system could be used more adequately and fully. The desirability of this situation is supported by findings in Table 11. An increase in combat effectiveness is felt to be equated with an increase in understanding of how to use the system.

Respondents generally felt they needed to know more about how to use the system, as shown in Table 12. Of the total sample, 63% felt they had insufficient knowledge on using the AS&R system. The proportion was not much lower for those who had frequently used the system. The proportion appeared even accentuated as a function of having only infrequent exposure to the system. Perhaps lack of understanding of the system may lead to infrequent use; infrequent use is associated with a lack of understanding of the system. The students at the Intelligence School, who receive more training in this area, were almost evenly divided on this point.

There was a feeling that more knowledge was required even though 57% of the total sample expected to depend on the G2 Air officer for details about the AS&R capability, as shown in Table 13. (The pattern of responses in Table 8 showed a willingness to leave details of acquiring information to the G2 Air officer.)

As for amount of detailed training on operating the AS&R system, the total sample was almost evenly divided between providing considerable detail and less detail but enough to communicate, as shown in Table 14. However, senior school respondents shifted noticeably toward less detail. The shift may reflect lesser intelligence detail required at the upper echelons; it indicates that depth of coverage of this area must be designed carefully for each student population. Within the time constraints imposed by class scheduling, enough detail must be presented to enable the potential user to realize what the system can do and how best to use it.

Table 10

Responses to Question on the Value of On-the-Job Training and Experience Versus Formal Schooling[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Agree | Frequent | .70 | .73 | .65 | .55 | .68 | .80 | .74 |
| | Infrequent | .54 | .53 | .62 | .51 | .46 | .63 | .65 |
| | Never | .26 | .26 | .30 | .23 | .20 | .42 | .22 |
| | All | .49 | .50 | .52 | .37 | .43 | .66 | .68 |
| Disagree | Frequent | .10 | .07 | .12 | .15 | .14 | .07 | .10 |
| | Infrequent | .15 | .15 | .08 | .22 | .23 | .17 | .09 |
| | Never | .20 | .17 | .14 | .30 | .20 | .16 | .11 |
| | All | .15 | .13 | .11 | .25 | .19 | .12 | .10 |
| Can't say | Frequent | .20 | .20 | .21 | .30 | .18 | .13 | .16 |
| | Infrequent | .30 | .33 | .29 | .26 | .32 | 17 | .26 |
| | Never | .53 | .55 | .56 | .45 | .60 | .42 | .56 |
| | All | .35 | .36 | .36 | .37 | .38 | .21 | .22 |

Note. Figures indicate proportion of selected responses.

[a]"Some officers feel much of their knowledge of the AS&R system came more from on-the-job training and experience rather than formal school training. Do you agree or disagree with this statement?"

[b]Based upon response to question, "To what extent have you ever requested air reconnaissance support during any of your operations?"

Table 11

Responses to Question on Increasing Combat Effectiveness Through Increased Understanding of the AS&R System[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Agree | Frequent | .86 | .83 | .89 | .84 | .91 | .95 | .82 |
| | Infrequent | .80 | .76 | .80 | .81 | .82 | .88 | .85 |
| | Never | .63 | .56 | .72 | .69 | .62 | .64 | .56 |
| | All | .75 | .71 | .80 | .75 | .78 | .86 | .81 |
| Disagree | Frequent | .04 | .05 | .02 | .03 | .03 | .00 | .07 |
| | Infrequent | .04 | .04 | .04 | .04 | .02 | .00 | .06 |
| | Never | .04 | .05 | .02 | .03 | .03 | .16 | .00 |
| | All | .04 | .05 | .03 | .03 | .02 | .03 | .07 |
| Can't say | Frequent | .10 | .12 | .08 | .13 | .06 | .05 | .10 |
| | Infrequent | .17 | .20 | .16 | .15 | .16 | .12 | .09 |
| | Never | .33 | .38 | .26 | .28 | .36 | .20 | .44 |
| | All | .20 | .24 | .17 | .22 | .20 | .10 | .12 |

Note. Figures indicate proportion of selected responses.

[a]"Some officers feel they would be able to increase their combat effectiveness if they knew more about how to use the AS&R system. Do you agree or disagree?"

[b]Based upon response to question, "To what extent have you ever requested air reconnaissance support during any of your operations?"

Table 12

Responses to Question on Sufficiency of Knowledge to Use the Aerial Surveillance and Reconnaissance System[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Sufficient | Frequent | .31 | .25 | .22 | .39 | .49 | .25 | .38 |
| | Infrequent | .17 | .12 | .09 | .16 | .41 | .19 | .21 |
| | Never | .17 | .11 | .04 | .24 | .36 | .16 | .11 |
| | All | .21 | .16 | .12 | .25 | .41 | .21 | .30 |
| Insufficient | Frequent | .58 | .65 | .63 | .52 | .39 | .62 | .54 |
| | Infrequent | .70 | .72 | .78 | .70 | .50 | .79 | .65 |
| | Never | .63 | .66 | .83 | .57 | .37 | .76 | .89 |
| | All | .63 | .67 | .75 | .60 | .41 | .70 | .61 |
| Can't say | Frequent | .10 | .10 | .14 | .08 | .10 | .13 | .07 |
| | Infrequent | .13 | .16 | .13 | .14 | .09 | .02 | .15 |
| | Never | .20 | .23 | .13 | .13 | .26 | .08 | .00 |
| | All | .15 | .17 | .14 | .15 | .16 | .09 | .10 |

Note. Figures indicate proportion of selected responses.

[a]"Do you feel you have sufficient knowledge, at present, of how to utilize the AS&R system?"

[b]"To what extent have you ever requested air reconnaissance support during any of your operations?"

Table 13

Responses to Question on Dependence on G2 Air Officer for Details on AS&R Capability[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Agree | Frequent | .56 | .55 | .53 | .43 | .52 | .67 | .66 |
| | Infrequent | .61 | .59 | .57 | .68 | .53 | .57 | .79 |
| | Never | .54 | .49 | .63 | .53 | .54 | .71 | .89 |
| | All | .57 | .54 | .58 | .55 | .53 | .65 | .72 |
| Disagree | Frequent | .29 | .26 | .28 | .42 | .26 | .32 | .22 |
| | Infrequent | .18 | .15 | .15 | .18 | .22 | .36 | .12 |
| | Never | .14 | .12 | .05 | .18 | .28 | .04 | .11 |
| | All | .20 | .17 | .16 | .22 | .25 | .27 | .18 |
| Can't say | Frequent | .15 | .18 | .18 | .25 | .22 | .02 | .12 |
| | Infrequent | .21 | .26 | .28 | .14 | .24 | .07 | .09 |
| | Never | .31 | .37 | .31 | .29 | .18 | .25 | .00 |
| | All | .23 | .28 | .25 | .22 | .22 | .08 | .11 |

Note. Figures indicate proportion of selected responses.

[a]"Do you anticipate that you would be dependent on the G2 Air for details about the AS&R capability?"

[b]Based upon response to question, "To what extent have you ever requested air reconnaissance support during any of your operations?"

Table 14

Responses to Question on How Much Detail Should be Given for Operation of AS&R Systems[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Considerable detail | Frequent | .41 | .44 | .46 | .45 | .39 | .30 | .35 |
| | Infrequent | .32 | .30 | .32 | .40 | .38 | .24 | .18 |
| | Never | .32 | .27 | .39 | .35 | .34 | .25 | .33 |
| | All | .35 | .33 | .39 | .38 | .37 | .26 | .29 |
| Less detail | Frequent | .46 | .41 | .41 | .38 | .42 | .65 | .59 |
| | Infrequent | .49 | .49 | .42 | .43 | .47 | .69 | .62 |
| | Never | .36 | .34 | .35 | .37 | .37 | .54 | .44 |
| | All | .43 | .41 | .39 | .39 | .42 | .64 | .59 |
| Can't say | Frequent | .12 | .15 | .12 | .17 | .19 | .05 | .06 |
| | Infrequent | .19 | .21 | .26 | .17 | .16 | .07 | .21 |
| | Never | .31 | .38 | .26 | .27 | .29 | .21 | .22 |
| | All | .21 | .25 | .21 | .22 | .22 | .09 | .12 |

Note. Figures indicate proportion of selected responses.

[a]"Do you feel you should be given considerable detail on the operation of the AS&R system or less detail but enough information to communicate with the system?"

[b]"To what extent have you ever requested air reconnaissance support during any of your operations?"

An open-ended question required each officer to state the most important training objective in using the AS&R system. The overwhelming response had three distinctive components: What capability does the AS&R system have? How can it be used? What can it do for the user? This information, integrated with the approach used to develop the training materials, provided the basis for selecting and preparing those materials. Several representative open-ended responses are included in Appendix C.

Of the total sample, 60% felt that more time should be devoted to AS&R capability and use during advanced formal school training (Table 15). All sampling sites show a trend for system experience to correlate with the desire for more time to be devoted to this area at the schools. Thus, there is a need to augment on-the-job training or experience with more schooling.

The student officers were asked to recommend AS&R subject matter areas they would include in new training materials if available. Students were also asked to rank each area as to importance. Table 16 shows the results for the total sample. The subject matter areas were selected because of their relation to specific area weaknesses in the curriculum and problem areas within the AS&R system. Several areas were selected for emphasis in the training materials as a result of this data distribution.

## DEVELOPMENT OF TRAINING MATERIALS

The information collected formed the basis for development of training materials. Several conclusions drawn from analyses of selected school curricula, as well as results of the questionnaires, were translated into material covering appropriate content areas in varying degrees of emphasis. In capsule form, these conclusions are (a) Combat Arms students felt they had insufficient knowledge of how to use the AS&R system, (b) more information about AS&R is learned on the job than in schools, (c) more time should be devoted to AS&R in schools, and (d) additional training should focus on providing practical exercises in the use of AS&R resources. Through a series of phases, the conclusions were translated into training objectives and the development of new training materials.

The technique resulted in a series of matrices that contained capsule statements providing guidance to the user of AS&R in planning for AS&R support and in making requests for AS&R information (see Appendix D). The cell entries reflect information designed to satisfy the training objectives of the study.

The initial step in this process was to review the relevant field manuals, training plans, and other documentation to determine doctrine and technical detail. Workbooks were prepared to allow integration of common and unique requirements in a format amenable to comparison and

Table 15

Responses to Question on the Need for More Formal School Training in Use of AS&R Systems[a]

| Response | Extent of prior tasking of air reconnaissance support[b] | Sample | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Total | Infantry School | Armor School | Field Artillery School | Intelligence School | Command and General Staff College | Army War College |
| Yes | Frequent | .68 | .67 | .71 | .74 | .65 | .78 | .56 |
| | Infrequent | .62 | .67 | .62 | .59 | .66 | .62 | .35 |
| | Never | .52 | .57 | .66 | .48 | .38 | .57 | .33 |
| | All | .60 | .63 | .66 | .56 | .55 | .70 | .48 |
| No | Frequent | .13 | .15 | .03 | .10 | .17 | .13 | .16 |
| | Infrequent | .14 | .07 | .06 | .29 | .21 | .14 | .15 |
| | Never | .15 | .09 | .03 | .24 | .24 | .13 | .11 |
| | All | .14 | .10 | .04 | .23 | .21 | .13 | .16 |
| Can't say | Frequent | .19 | .18 | .24 | .16 | .17 | .08 | .26 |
| | Infrequent | .25 | .27 | .30 | .12 | .14 | .24 | .50 |
| | Never | .33 | .33 | .31 | .28 | .37 | .30 | .56 |
| | All | .26 | .26 | .29 | .21 | .24 | .17 | .35 |

Note. Figures indicate proportion of selected responses.

[a]"Do you feel more time should be devoted to AS&R capability and utilization in advanced formal school training?"

[b]Based upon response to question, "To what extent have you ever requested air reconnaissance support during any of your operations?"

Table 16

Selection of AS&R Subject Matter Areas and Degree of Importance

| Subject matter area | Very important | Important | Less important | Would not include |
|---|---|---|---|---|
| Overview of AS&R capability to include all equipment and personnel assets | .48 | .43 | .07 | .02 |
| The responsibilities of the G2 Air officer | .27 | .52 | .16 | .03 |
| Characteristics of airborne sensors | .26 | .51 | .20 | .03 |
| AS&R capability for special studies | .19 | .37 | .34 | .08 |
| AS&R/requester communication channels | .45 | .38 | .13 | .04 |
| AS&R mission request priority | .30 | .46 | .20 | .03 |
| Mission request processing procedures for both preplanned and immediate requests | .32 | .41 | .23 | .05 |
| Formulation of essential elements of information | .35 | .41 | .17 | .06 |
| AS&R intelligence reports | .31 | .48 | .17 | .04 |

Note. Figures indicate proportion of selected responses for the total sample.

analysis. Workbooks contained information by branch (Infantry, Armor, Artillery, and Intelligence) and in terms of key personnel skills, organization and structure of operating units, tactics, equipment resources, and training guidance. The workbooks were used in the next phase, which compared operational and AS&R requirements to the training materials received from the respective branch schools (curriculum content analysis). Results of this analysis were shown in Figure 1.

The process of developing content was iterative, once the available documentation had been integrated and reduced to essential information. Results of the questionnaire analysis were used for guidance in developing content areas and degrees of emphasis. Particular attention was paid to both objective and open-ended responses in those sections of the questionnaire that addressed G2 Air officer duties, AS&R system procedures, and AS&R training recommendations. Responses that reflected insufficient knowledge of the AS&R system were analyzed and reviewed, and an overall training objective was written. This approach led, for example, to the need for a section in the formal training materials on AS&R resources in terms of key personnel and equipment. Other objectives required emphasis on certain areas such as visual reconnaissance.

Each cell represents the potential AS&R capability in a particular tactical environment. Three tactical environments were selected: offensive operations, defensive operations, and retrograde.

Subcategories, such as counterattack, were considered as parts of major categories, such as offensive operations. AS&R categories were selected from the functional task list found in "AS&R MANAGER." These categories were thought to encompass the resources of the AS&R system available to the combat commander. The tactical environments, commander information requirement categories, and cell entries were verified with intelligence specialists at Fort Huachuca, Ariz. The matrices were correlated with the content of the training materials developed. They were included in the final version of the materials to allow the student an overview of his/her information needs and the needs of related fire and maneuver elements.

This material was organized into a document (Combat Commanders Guide to Aerial Surveillance and Reconnaissance Resources) prepared primarily for combat commanders at battalion and brigade levels as a guide to the AS&R system. The guide was designed to supplement reading materials available during portions of the advanced officer course dealing with intelligence at branch schools.

The objectives of the guide are (a) to describe the AS&R system available, (b) to show how to use the system, and (c) to help visualize what to expect from the AS&R system.

The materials in the guide are organized around the capability of the AS&R system as a function of three tactical environments: offense, defense, and retrograde. Information is further organized for the Infantry, Armor, and Artillery Branches. This provides more branch-unique information to better apply AS&R capability to specific fire and maneuver requirements. A key word and acronym list is also provided for quick entry into the document. This list supplements the table of contents which is organized around a "real world" approach to using the AS&R system.

This guide also could be used by AS&R instructors to develop lesson plans, prepare visual aids, prepare additional exercises, and as review or refresher materials. The guide provides a bridge between AS&R capability and the needs of the field commander.

Although materials have been prepared in the form of a guide to supplement classroom instruction, they can be developed into a programed text format at a later date. Such a format could be used for incorporating these materials into nonresident correspondence courses and evaluating their effectiveness and acceptance.

## DEVELOPMENT OF JOB AIDS

The materials developed for a formal school setting served as a basis for preparing aids for AS&R users in the field. The job aids are intended to provide information to the user while performing duties and to facilitate decisionmaking on use of the AS&R system. As such, the job aids have the quality of reference manuals with guidance on procedures to follow and persons to contact. The job aids were prepared in a format amenable to field use: small, easy to carry, and with space for notes by the user. The AS&R information matrices also formed the basis for developing the job aids. Narratives emphasized the procedures and personnel to contact in achieving the best use of AS&R resources for a variety of environments. More detailed materials, such as field manuals, were referenced for later review. The job aids attempted to structure materials for more immediate information requirements where time was a critical factor.

Separate job aids were prepared for the infantry, armor, and artillery commanders ("Commanders Field Aid to Aerial Surveillance and Reconnaissance Utilization"). Both common and unique aspects of AS&R use were discussed in each aid. A list of key words and acronyms was provided and cross-referenced to the text for easy use.

The individual field aids were prepared for the unit commander as a ready reference to assist him in formulating information requests to the S2/G2 or G2 Air officer. The aids emphasize effective use of the AS&R resources available.

The aid does not substitute for experience or detailed technical information. By using the included series of Commander AS&R Information Matrices, the commander will have a guide to developing AS&R requests for information about the enemy, terrain, and weather and can use a greater measure of the AS&R capability in combat. Each cell entry in the matrices indicates what AS&R capability or product the commander can expect as a function of tactical environment and his information requirements.

Integrated with the job aid materials were checklists to be used as a means for verifying procedures or information learned and to increase retention. Provision for tailoring the aid for specific requirements was made by including a section for notes. Most of the guidance provided in the job aids was also in the formal school materials. The job aid was, however, independent of the formal document relying on suggested references and personnel contacts from which greater amounts of information could be obtained.

The job aids were designed to provide guidance and direction to the commander in obtaining the maximum benefit from his available AS&R resources. Knowing how to use this system and what to expect from it could improve the commander's effectiveness. Further, any improvements in providing the AS&R resources to the commander would then be felt sooner. Future planners have already begun to explore one such improvement: an automated reference file and management system. A well-informed commander is essential to successful use of the system.

## APPENDIX A

## EXERCISES PRESENTED IN THE QUESTIONNAIRE

You have requested support for your operations from the AS&R resources available to you through your G2 or G2 Air. For the situations presented on the following pages, answer each item by selecting the response which best represents what you would expect your G2 or G2 Air to do given each tactical situation and essential elements of information (EEI).

Read each tactical situation and EEI carefully before marking your choice on the answer sheet. Each item is independent of the others.

TACTICAL SITUATION

- Enemy armored unit possible in area 0-55 Km beyond FEBA X 50 Km wide.
- Movement restricted to roads due to rough terrain.
- Moderate canopy cover in target area.

Weather: Clear Time 1000 hours

EEI DETERMINATIONS

- Size of unit
- Number and type of weapons
- Movement rate and direction

DNLV: Less than an hour

SELECT ONE:

(A) Request Air Force Tactical Reconnaissance support to fly route mission with IR and photo sensor.

(B) Request OV-1C/D visual AS&R.

(C) Request UGS platoon data-seismic and acoustic detection (implanted).

(D) Request OV-1C/D SLAR coverage 0-50 Km (with data-link transmission along major road) and Air Force photographic route mission 20-50 Km along major roads.



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TACTICAL SITUATION

- Enemy armored unit suspected in area 55-80 Km beyond FEBA X 55 Km wide.
- Terrain permits overland movement of tracked vehicles.
- Sparse canopy cover in target area.

Weather: Intermittent cloud cover
Time 1300 hours

EEI DETERMINATIONS

- Size of unit
- Number and type of vehicles and weapons
- Movement rate and direction

DNLV: Approximately 2 hours

SELECT ONE:

(A) Request UGS platoon data seismic and acoustic detection.

(B) Request Air Force Tactical Reconnaissance support to fly area coverage--photographic sensor KA-56 Panoramic.

(C) Request movement detection by ground surveillance radar.

(D) Request SLAR coverage by OV-1B/D.

* * *

TACTICAL SITUATION

- Enemy armored unit detected by UGS platoon at approximate coordinates X and Y. 20 Km beyond FEBA.
- Movement restricted to night on roads.
- Sparse canopy cover.

Weather: Prolonged dense cloud cover, ceiling approximately 2,000 ft. Time 2000 hours.

EEI DETERMINATIONS

- Number of weapons
- Rate and direction of movement
- Coordinates within 200 meters

DNLV: Approximately 0.5 hour

SELECT ONE:

(A) Request Air Force support, point mission to cover area surrounding specified coordinates with SLAR (MTI) and IR sensor.

(B) Request Air Force point coverage, vert photo with photo flash.

(C) Contact Division Aviation officer. Suggest UH-1 helicopter coverage with XM3 Personnel Detector.

(D) Request Mohawk SLAR and IR coverage with data link transmission.

* * *

TACTICAL SITUATION

- Friendly aircraft lost at approximate coordinates X and Y. 20 Km beyond FEBA. Search for enemy anti-aircraft weapons in area within 5 Km radius of specified coordinates.

Weather: Cloudy Time 1900

EEI DETERMINATIONS

- Type weapon
- Fire control system
- Location within 100 meters

DNLV: 1 hour

SELECT ONE:

(A) Request Air Force photo coverage of area within 20 Km of coordinates X and Y.

(B) Contact ASA platoon for electronic surveillance.

(C) Request OV-1C IR coverage with data link transmission.

(D) Request Div Arty for ground radar surveillance.

TACTICAL SITUATION

- Assess enemy field defenses in the zone from 60-100 Km beyond FEBA 60 Km wide.

Weather: Clear

EEI DETERMINATIONS

- Determine changes in:
  - Anti-tank obstacles
  - Road blocks
  - Mine fields
  - Bunkers
  - Launch sites
  - Pill boxes

DNLV: 48 hours

SELECT ONE:

(A) Request Air Force Tactical Reconnaissance support. Panoramic coverage and vertical coverage.

(B) Contact Order of Battle and Interrogation of Prisoners of War to develop any material on defenses.

(C) Request Air Force support with no sensor specified.

(D) Contact Army Security Agency unit to monitor and evaluate radio and electronic traffic.

* * *

TACTICAL SITUATION

- Surveillance of enemy airfield 600 Km beyond FEBA.

Weather: Heavy, low cloud cover
Ceiling 1,000 ft. Time 0800

EEI DETERMINATIONS

- Number and type of aircraft

DNLV: 12 hours

SELECT ONE:

(A) Request Air Force TAC recon point mission with SLAR.

(B) Request Air Force TAC recon mission with low altitude panoramic camera and IR.

(C) Request ASA electronic surveillance.

(D) Obtain required data and imagery at 1:10,000 scale or larger from Army AS&R resources.

* * *

## APPENDIX B

## SUPPLEMENTARY FINDINGS

### Table B-1

Incidence of Experiences with Aerial Surveillance & Reconnaissance
(proportion of responses to situations indicated)

| Situation | Sample[a] | Response Selected[b,c] "Frequently" | "Infrequently" | "Never" |
|---|---|---|---|---|
| "I requested information which I knew stretched the capability of the AS&R system and received the requested information." | T | .03 | .15 | .33 |
| | I | .02 | .13 | .35 |
| | A | .02 | .08 | .34 |
| | At | .02 | .11 | .27 |
| | It | .05 | .15 | .31 |
| | C | .03 | .21 | .45 |
| | W | .03 | .41 | .38 |
| "I requested information of the AS&R system and received the information I requested." | T | .25 | .17 | .10 |
| | I | .22 | .17 | .12 |
| | A | .24 | .13 | .12 |
| | At | .15 | .14 | .10 |
| | It | .35 | .16 | .05 |
| | C | .44 | .22 | .04 |
| | W | .44 | .40 | .02 |
| "I requested information of the AS&R system but did not receive any." | T | .03 | .23 | .25 |
| | I | .04 | .19 | .26 |
| | A | .02 | .18 | .27 |
| | At | .01 | .16 | .20 |
| | It | .04 | .23 | .25 |
| | C | .03 | .42 | .24 |
| | W | .08 | .52 | .23 |
| "I requested information of the AS&R system and received information of little use, i.e., not timely, incomplete, and inaccurate." | T | .06 | .26 | .17 |
| | I | .05 | .21 | .20 |
| | A | .04 | .21 | .18 |
| | At | .03 | .18 | .16 |
| | It | .06 | .29 | .15 |
| | C | .11 | .46 | .15 |
| | W | .17 | .59 | .07 |



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Table B-1 (continued)

| Situation | Sample[a] | Response Selected[b,c] "Frequently" | "Infrequently" | "Never" |
|---|---|---|---|---|
| "I did not know what to expect from the AS&R system and did not make any requests." | T | .06 | .09 | .21 |
| | I | .06 | .09 | .21 |
| | A | .05 | .07 | .18 |
| | At | .06 | .06 | .16 |
| | It | .06 | .05 | .23 |
| | C | .10 | .20 | .21 |
| | W | .01 | .14 | .32 |
| "I knew the AS&R system could not deliver the information I needed, therefore I did not make any requests." | T | .03 | .10 | .21 |
| | I | .03 | .10 | .21 |
| | A | .02 | .06 | .20 |
| | At | .02 | .07 | .17 |
| | It | .05 | .06 | .18 |
| | C | .03 | .19 | .26 |
| | W | .07 | .20 | .30 |

[a]Sample code: T - Total; I - Infantry School; A - Armor School; At - Artillery School; It - Intelligence School; C - Command & General Staff College; W - War College.

[b]The respondent was instructed to respond to each of the situations.

[c]A fourth alternative response was "N/A."

TABLE B-2

Responses to question: "The responsiveness of the AS&R system to deliver information to any requester in terms of timeliness, from what you perceive the AS&R capability to be, is:"

(Proportion of selected responses.)

| Response Selected | Extent of prior[a] tasking of air recon support. | Total | Sample: Infantry School | Armor School | Field Arty School | Intell School | Comm & Gen Staff College | War College |
|---|---|---|---|---|---|---|---|---|
| "Adequate" | Frequent | .41 | .37 | .58 | .29 | .49 | .44 | .34 |
| | Infrequent | .25 | .25 | .25 | .27 | .32 | .18 | .19 |
| | Never | .16 | .10 | .20 | .17 | .20 | .13 | .14 |
| | All | .27 | .24 | .34 | .22 | .33 | .31 | .28 |
| "Marginal" | Frequent | .27 | .25 | .13 | .27 | .22 | .32 | .47 |
| | Infrequent | .23 | .19 | .21 | .25 | .33 | .30 | .31 |
| | Never | .10 | .08 | .02 | .15 | .11 | .13 | .00 |
| | All | .20 | .17 | .12 | .20 | .21 | .28 | .39 |
| "Inadequate" | Frequent | .12 | .12 | .07 | .18 | .13 | .14 | .13 |
| | Infrequent | .10 | .09 | .07 | .17 | .05 | .15 | .13 |
| | Never | .04 | .01 | .04 | .06 | .05 | .04 | .14 |
| | All | .08 | .07 | .06 | .11 | .07 | .12 | .13 |
| "Can't say" | Frequent | .20 | .27 | .22 | .25 | .16 | .10 | .06 |
| | Infrequent | .41 | .47 | .47 | .31 | .32 | .36 | .38 |
| | Never | .71 | .81 | .74 | .63 | .64 | .70 | .71 |
| | All | .45 | .52 | .49 | .47 | .38 | .29 | .20 |

[a]Based upon response to question: "To what extent have you ever requested air reconnaissance support during any of your operations?"

TABLE B-3

Responses to question: "The responsiveness of the AS&R system to deliver information to any requester in terms of accuracy from what you perceive the AS&R capability to be, is:"

(Proportion of selected responses.)

| Response Selected | Extent of prior[a] tasking of air recon support. | Total | Sample: Infantry School | Armor School | Field Arty School | Intell School | Comm & Gen Staff College | War College |
|---|---|---|---|---|---|---|---|---|
| "Adequate" | Frequent | .54 | .44 | .60 | .46 | .64 | .59 | .66 |
| | Infrequent | .41 | .38 | .38 | .40 | .57 | .47 | .34 |
| | Never | .21 | .13 | .18 | .28 | .27 | .22 | .22 |
| | All | .38 | .31 | .38 | .35 | .48 | .48 | .53 |
| "Marginal" | Frequent | .16 | .19 | .10 | .18 | .13 | .17 | .15 |
| | Infrequent | .10 | .11 | .06 | .17 | .05 | .09 | .11 |
| | Never | .04 | .03 | .03 | .04 | .04 | .00 | .11 |
| | All | .10 | .11 | .06 | .10 | .08 | .11 | .14 |
| "Inadequate" | Frequent | .03 | .01 | .01 | .05 | .03 | .05 | .03 |
| | Infrequent | .01 | .02 | .00 | .01 | .02 | .00 | .00 |
| | Never | .02 | .03 | .01 | .03 | .01 | .04 | .00 |
| | All | .02 | .02 | .01 | .03 | .02 | .03 | .02 |
| "Can't say" | Frequent | .28 | .35 | .29 | .31 | .20 | .19 | .16 |
| | Infrequent | .47 | .49 | .56 | .43 | .36 | .47 | .54 |
| | Never | .73 | .82 | .78 | .64 | .68 | .74 | .67 |
| | All | .50 | .56 | .55 | .52 | .42 | .38 | .31 |

[a]Based upon response to question: "To what extent have you ever requested air reconnaissance support during any of your operations?"

TABLE B-4

Responses to question: "The responsiveness of the AS&R system to deliver information to any requester in terms of completeness, from what you perceive the AS&R capability to be, is:"

(Proportion of selected responses.)

| Response Selected | Extent of prior[a] tasking of air recon support. | Total | Sample: Infantry School | Armor School | Field Arty School | Intell School | Comm & Gen Staff College | War College |
|---|---|---|---|---|---|---|---|---|
| "Adequate" | Frequent | .43 | .39 | .43 | .34 | .56 | .48 | .49 |
| | Infrequent | .34 | .33 | .32 | .32 | .50 | .38 | .23 |
| | Never | .16 | .08 | .14 | .24 | .22 | .22 | .22 |
| | All | .31 | .26 | .29 | .28 | .42 | .40 | .39 |
| "Marginal" | Frequent | .22 | .19 | .18 | .31 | .19 | .22 | .31 |
| | Infrequent | .14 | .13 | .10 | .20 | .09 | .13 | .20 |
| | Never | .06 | .05 | .04 | .09 | .03 | .00 | .11 |
| | All | .14 | .12 | .11 | .16 | .10 | .15 | .26 |
| "Inadequate" | Frequent | .04 | .05 | .03 | .05 | .01 | .05 | .03 |
| | Infrequent | .02 | .04 | .00 | .01 | .03 | .00 | .00 |
| | Never | .03 | .02 | .00 | .04 | .04 | .04 | .00 |
| | All | .03 | .04 | .01 | .04 | .03 | .03 | .02 |
| "Can't say" | Frequent | .30 | .36 | .36 | .30 | .24 | .25 | .18 |
| | Infrequent | .50 | .51 | .58 | .47 | .38 | .49 | .57 |
| | Never | .75 | .85 | .82 | .63 | .71 | .74 | .67 |
| | All | .53 | .58 | .59 | .52 | .45 | .42 | .33 |

[a]Based upon response to question: "To what extent have you ever requested air reconnaissance support during any of your operations?"

TABLE B-5

Responses to statement: "The AS&R system has only a limited capability for satisfying the targeting needs of field artillery units."
(Proportion of selected responses).

| Response Selected | Extent of prior[a] tasking of air recon support | Total | Sample: Infantry School | Armor School | Field Arty School | Intell School | Comm & Gen Staff College | War College |
|---|---|---|---|---|---|---|---|---|
| "Agree" | Frequent | .22 | .16 | .12 | .41 | .25 | .26 | .31 |
| | Infrequent | .13 | .12 | .05 | .37 | .25 | .27 | .20 |
| | Never | .16 | .09 | .05 | .32 | .14 | .17 | .22 |
| | All | .19 | .12 | .08 | .35 | .21 | .25 | .28 |
| "Disagree" | Frequent | .25 | .20 | .20 | .37 | .30 | .23 | .26 |
| | Infrequent | .19 | .15 | .19 | .37 | .14 | .07 | .11 |
| | Never | .15 | .07 | .13 | .23 | .24 | .13 | .22 |
| | All | .19 | .15 | .17 | .30 | .23 | .15 | .21 |
| "Can't say" | Frequent | .52 | .64 | .66 | .22 | .43 | .51 | .41 |
| | Infrequent | .62 | .72 | .72 | .25 | .61 | .66 | .66 |
| | Never | .68 | .81 | .82 | .45 | .62 | .70 | .56 |
| | All | .61 | .72 | .74 | .35 | .55 | .60 | .50 |

[a] Based upon response to question; "To what extent have you ever requested air reconnaissances support during any of your operations?"

TABLE B-6

Response to statement: "The AS&R system has only a limited capability for satisfying the surveillance and reconnaissance needs of armor units."

(Proportion of selected responses.)

| Response Selected | Extent of prior[a] tasking of air recon support | Sample: Total | Infantry School | Armor School | Field Arty School | Intell School | Comm & Gen Staff College | War College |
|---|---|---|---|---|---|---|---|---|
| "Agree" | Frequent | .15 | .12 | .12 | .19 | .19 | .18 | .18 |
| | Infrequent | .13 | .10 | .10 | .17 | .22 | .15 | .06 |
| | Never | .06 | .05 | .03 | .09 | .11 | .00 | .11 |
| | All | .11 | .09 | .08 | .13 | .17 | .13 | .14 |
| "Disagree" | Frequent | .36 | .30 | .46 | .21 | .48 | .37 | .44 |
| | Infrequent | .24 | .21 | .32 | .26 | .29 | .21 | .26 |
| | Never | .16 | .14 | .18 | .13 | .30 | .20 | .11 |
| | All | .25 | .22 | .32 | .18 | .36 | .28 | .35 |
| "Can't say" | Frequent | .49 | .57 | .40 | .60 | .33 | .45 | .37 |
| | Infrequent | .62 | .69 | .54 | .57 | .48 | .65 | .66 |
| | Never | .75 | .78 | .79 | .76 | .59 | .80 | .67 |
| | All | .62 | .68 | .58 | .68 | .47 | .58 | .49 |

[a] Based upon response to question; "To what extent have you ever requested air reconnaissance support during any of your operations?"

## APPENDIX C

## SELECTED COMMENTS FROM THE QUESTIONNAIRES

### I. AS&R Field Experience and Utilization

"In addition to frequent Air Cavalry troop surveillance, I personally made visual observations from my organic OH-6."

"As G3 Air I worked closely with the G2 Air on aircraft utilization and specific missions desired by the requesting units."

"As a company commander reports were more useful than actual photographs, unless photos were of a planned objective."

"Requested surveillance of likely enemy avenues of movement to plan sensor programs."

"Used aircraft in my area that I could communicate with."

"I was never given nor used an AS&R report."

"By the time AS&R information reaches the battalion, it is often useless unless it is a VR by a member of the battalion."

### II. Knowledge of AS&R Operations

"Personnel must have understanding, first hand, of what infantry needs, recommend 'face to face' coordination."

"I feel that the G2 Air should know the capabilities of sensor equipment better than the requesting officer. My opinion is that the G2 Air can best decide the means to satisfy the request for support."

"I am an OV-1 pilot and have served two tours in Vietnam, therefore, I feel the AS&R system to be extremely adequate if used properly by the ground commander."

"I don't really know a whole lot about the AS&R system."

"Photos can give accurate grids for artillery fire."

### III. AS&R Training

"The most important training objective for AS&R would be to teach what is available and how it could assist you in accomplishing your missions."



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"The AS&R system's capability and guidelines regarding what sensors can be employed against what targets."

"AS&R system training should be given in a formal school prior to the officer advanced course; many officers command tactical units with inadequate information in this area; including me. This training would enhance leader effectiveness if given earlier in one's career."

"Need training in requester command channels, AS&R mission request priority, mission request processing procedures."

APPENDIX D

COMMANDER AS&R INFORMATION MATRICES

## INFANTRY COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | DEFENSIVE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM (3) |
| **TACTICAL** | | | | | |
| PERSONNEL | LOCATION OR DETECTION OF SMALL UNITS. LIMITED AREA APPLICATION. | DETECTION OF LARGE MOVEMENT AND ACTIVITY. PHOTO PRIMARY. LARGE AREA CAPABILITY. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS CONCERNING TROOP MOVEMENT. | HOT REP & IPIR FOR LARGE UNIT ACTIVITY. | DETAILED ANALYSIS OF TROOP DISPERSMENT OVER AREA OF INTEREST. GPIR |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | DETECTION OF ENEMY VEHICLE MOVEMENT ALONG ROUTES. LIMITED AREA APPLICATION. | ARMOR MECH. INFANTRY THREAT ON OR NEAR FEBA. ALL SENSORS LARGE AREA CAPABILITY. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS FOR RECENT VEHICLE ACTIVITY. | HOT REP & IPIR ACTIVITY TOWARD OR AWAY FROM FEBA. | DETAILED ANALYSIS OF ARMOR MECHANIZED INFANTRY DISPERSMENT, SUPPLY POINTS, NEAR FEBA. GPIR |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | CONFIRM OR DETECT WEAPONS WHICH CAN ATTACK FRIENDLY TROOPS. AREA LIMITED | ALL SENSORS USED TO DETECT WEAPON EMPLACEMENTS PHOTO FOR WEAPON IDENTIFICATION. LARGE AREA. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELON CONFIRM WEAPON LOCATIONS AND ALTERNATE EMPLACEMENTS. | HOT REP & IPIR DETECT ACTIVE WEAPONS EMPLACEMENTS TIME SENSITIVE | DETAILED ANALYSIS OF AREA IN FRONT OF FEBA TO LOCATE WEAPONS WHICH CAN ATTACK FRIENDLY FORCES GPIR |
| FORTIFICATIONS | CONFIRM ACTIVITY LEVEL. AREA LIMITED. | ALL SENSORS TO DETECT ACTIVITY LEVELS AND CHANGES. LARGE AREA CAPABILITY | SIT MAP & INTELLIGENCE REPORTS ALL ECHELONS DETERMINING ACTIVITY LEVEL AND CHANGE. | HOT REP AND IPIR DETECT ACTIVITY LEVEL. CHANGE DETECTION ANALYSIS OF LIMITED AREA. | DETAILED ANALYSIS OF FORTIFICATIONS WITH PROBABLE MANNING STRENGTH. GPIR |
| **ENVIRONMENTAL** | | | | | |
| WEATHER | OBSERVED CONDITIONS IN LOCAL AREA | SEVERITY OF WEATHER DETERMINES LIMITATIONS. | OBSERVED LOCAL WEATHER CONDITIONS AND ADJACENT UNITS REPORTS | SHORT TERM WEATHER FORECAST FROM WEATHER OFFICER. | AREA WEATHER HISTORY FROM WEATHER OFFICER. |
| TOPOGRAPHY | LIMITED TO IMMEDIATE AREA. VALIDATE MAP INFORMATION | PHOTO COVERAGE OF LARGE AREA SHOWS DETAIL TOPOGRAPHY DATA FOR COVER AND CONCEALMENT. | NOT APPLICABLE | NOT APPLICABLE | DETAILED PHOTO ANALYSIS FOR COVER, PATROL ROUTES, AMBUSH POINTS, ENGINEERING STUDY, ETC. GPIR |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | LIMITED AREA VALIDATION OF DOCUMENTED FEATURES OR CHANGES IN FEATURES. | PHOTO, MEDIUM SCALE, LARGE AREA COVERAGE FOR UPDATING OF EXISTING DATA. | INTELLIGENCE REPORTS FROM ALL ECHELONS. RECENT CHANGES IN ITEMS. | HOT REP & IPIR TO UPDATE ITEMS WHICH HAVE CHANGED. | INDEPTH STUDY TO UPDATE MAPS AND OVERLAYS WITH ALL CHANGES. GPIR |
| VEGETATION | LOCATE AREAS WHICH OFFER COVER & CONCEALMENT FOR FRIENDLY OR ENEMY TROOPS. | LARGE AREA PHOTO MISSION TO DETECT LIKELY AREAS OF ENEMY CONCEALMENT. | INTEL REPORTS FROM ALL ECHELONS ON VEGETATION AND EFFECT ON OPERATIONS. | NOT APPLICABLE | INDEPTH STUDY OF VEGETATION TYPES, CHARACTERISTICS AND DISTRIBUTION. GPIR |
| HYDROGRAPHIC | DETECT CHANGES IN HYDROGRAPHIC CONDITIONS WHICH EFFECT FRIENDLY AND ENEMY CAPABILITY. | PHOTO & IR FOR CHANGES IN WATER DISTRIBUTION DUE TO SEVERE WEATHER. | INTELLIGENCE REPORTS FROM ALL ECHELON FOR CHANGES IN WATER LEVEL AND FLOW RATE. | HOT REP & IPIR USING IR DATA LINK FOR WATER DISTRIBUTION PHOTO FOR DETAIL. | INDEPTH STUDY OF DEPTH AND DISTRIBUTION OF HYDROGRAPHIC FEATURES. GPIR |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS
(3) LONG TERM STUDIES DURING SLACK DEFENSE PERIODS WILL BE USED TO PLAN FOR ATTACK OR RETROGRADE MANEUVERS.

# INFANTRY COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | OFFENSIVE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR(1) | ON HAND | IMMEDIATE (2) | LONG TERM |
| TACTICAL | | | | | |
| PERSONNEL | PRIMARY MEANS OF AS&R. LOCATE POINTS OF RESISTANCE LIMITED AREA CAPABILITY. | IR DATA LINK USED TO DETECT TROOPS UNDER SPECIFIC CONDITIONS. | SIT MAP, INTELLIGENCE REPORTS FROM ALL ECHELONS AND TREND STUDIES TO LOCATE STRONG POINTS. | HOT REP & IPIR ARE USE LIMITED DUE TO PROCESSING TIME AND TROOP MOBILITY. | OF NO VALUE DUE TO TIME FACTOR. |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | GOOD AS&R CAPABILITY DETECTION TRACKED & WHEELED MECHANIZED REINFORCEMENTS. AREA LIMITED. | SLAR, MTI DATA LINK PRIMARY SENSOR MONITOR TRACKED AND WHEELED MECHANIZED REINFORCEMENT | SIT MAP, & ROAD STUDIES GIVE PROBABLE ROUTE AND AREA OF TRACKED AND WHEELED THREAT. | DATA QUESTIONABLE DUE TO TIME FACTOR AND FLUID SITUATION | SAME AS ABOVE |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | PRIMARY AS&R RESOURCE DETECT WEAPONS WHICH ARE ATTACKING FRIENDLY TROOPS AREA LIMITED. | IR DATA LINK CAPABILITY USED TO DETECT ACTIVE WEAPONS. | SIT MAP & INTELLIGENCE REPORTS ALL ECHELONS ACTIVE AND ALTERNATE WEAPON EMPLACEMENTS. | HOT REP & IPIR USED TO DEVELOP TARGET DATA TIME LIMITED. (LITTLE ENEMY MOVEMENT IN DAY). | SAME AS ABOVE |
| FORTIFICATIONS | PRIMARY AS&R MONITORS OVERALL SUCCESS IN NEUTRALIZING. AREA LIMITED. | LIMITED USE SLAR & IR SCALE LIMITED PHOTO TIME LIMITED. | INTELLIGENCE REPORTS FROM ALL ECHELON FOR INCREASE IN ACTIVITY. REPORTS GENERATED DURING ATTACK PLANNING. | HOT REP & IPIR USEFUL IN MONITORING INCREASED DEFENSIVE ACTIVITY IN REAR AREA. | SAME AS ABOVE |
| ENVIRONMENTAL | | | | | |
| WEATHER | ATTACK PLAN SHOULD INCLUDE WEATHER CONSIDERATIONS. | ATTACK PLAN SHOULD INCLUDE WEATHER CONSIDERATIONS. | NOT APPLICABLE AFTER UNIT IS COMMITTED TO OPERATION. | SHORT TERM WEATHER FORECAST FROM WEATHER OFFICER. | NOT APPLICABLE |
| TOPOGRAPHY | LIMITED AREA CAPABILITY FOR MAP VALIDATION BEYOND CURRENT INTELLIGENCE. | SLAR MAP FOR SMALL SCALE, LARGE AREA, INDICATIONS OF TOPOGRAPHY | REPORTS GENERATED DURING ATTACK PLANNING. | HOT REP & IPIR TO CONFIRM TOPOGRAPHY FEATURES. LIMITED AREA DUE TO TIME. | REQUEST HIGHER ECHELON FOR GPIR IF MANEUVER WILL CARRY UNIT BEYOND KNOWN INTELLIGENCE. |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | PRIMARY AS&R FOR DETECTING ITEMS & CHANGES WHICH WILL EFFECT OPERATION. | SLAR OR IR DATA LINK FOR DETECTION OF GROSS ITEMS CHANGED. | SAME AS ABOVE | HOT REP & IPIR FOR SMALL AREAS. TIME LIMITED. | SAME AS ABOVE |
| VEGETATION | LOCATE COVER FOR FRIENDLY TROOPS OR POSSIBLE ENEMY AMBUSH POINTS. LIMITED AREA. | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | SAME AS ABOVE |
| HYDROGRAPHIC | PRIMARY AS&R RESOURCE FOR DETECTING CHANGES DUE TO SEVERE WEATHER. | IR DATA LINK FOR GROSS AREA DISTRIBUTION. | NOT APPLICABLE | HOT REP & IPIR FOR CHANGES DUE TO SEVERE WEATHER. TIME LIMITED. | NOT APPLICABLE |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS

# INFANTRY COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | RETROGRADE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM |
| TACTICAL | | | | | |
| PERSONNEL | PRIMARY AS&R RESOURCE. AREA LIMITED. USE LIMITED DUE TO PRIORITY ON AIRCRAFT. | IR DATA LINK MOST LIKELY. | QUESTIONABLE RELIABILITY DUE TO FLUID SITUATION. | OF NO VALUE DUE TO TIME LIMIT. | NOT APPLICABLE |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | PRIMARY AS&R RESOURCE. SEARCH ROADS FOR TRACKED OR WHEELED ENEMY ADVANCE. AREA LIMITED. | SLAR, MTI DATA LINK MOST LIKELY SYSTEM. | SAME AS ABOVE | SAME AS ABOVE | NOT APPLICABLE |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | PRIMARY AS&R RESOURCE. DETECT WEAPON MOVEMENT AND ATTACKING WEAPONS AREA LIMITED. | SLAR OR IR DATA LINK MOST LIKELY SYSTEM. | SAME AS ABOVE | SAME AS ABOVE | NOT APPLICABLE |
| FORTIFICATIONS | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE |
| ENVIRONMENTAL | | | | | |
| WEATHER | OBSERVED CONDITIONS IN LOCAL AREA. | SEVERITY OF WEATHER DETERMINES LIMITATIONS. | OBSERVED LOCAL CONDITIONS & ADJACENT UNIT REPORTS. | SHORT TERM FORECAST FROM WEATHER OFFICER. | NOT APPLICABLE |
| TOPOGRAPHY | PRIMARY AS&R CAPABILITY. CONFIRM MAP TOPOGRAPHY DATA. LIMITED AREA. | NOT APPLICABLE | ONLY AVAILABLE IF INCLUDED IN PLANNING PHASE. | NOT APPLICABLE | NOT APPLICABLE |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | PRIMARY AS&R CAPABILITY. DETECT CHANGES WHICH WOULD HAMPER UNIT LIMITED AREA. | SLAR OR IR MAPPING DATA LIMITED TO DETECT GROSS CHANGES. | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |
| VEGETATION | PRIMARY AS&R CAPABILITY. LOCATE COVER FOR FRIENDLY TROOPS AND POSSIBLE AMBUSH POINTS. | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |
| HYDROGRAPHIC | PRIMARY AS&R CAPABILITY OBSERVING RESULTS OF SEVERE WEATHER. | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS

# ARTILLERY COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | DEFENSIVE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM (3) |
| TACTICAL | | | | | |
| PERSONNEL | LOCATION OR DETECTION OF SMALL UNITS WITHIN RANGE OF FRIENDLY WEAPONS. AREA LIMITED. | PHOTO, LARGE AREA CAPABILITY FOR DETECTION OF LARGE UNIT ACTIVITY WITHIN FIRING GRID. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS CONCERNING TROOPS. | HOT REP & IPIR FOR LARGE UNIT ACTIVITY AND LOCATION. TIME LIMITED. | DETAILED ANALYSIS OF ENEMY TROOP DISTRIBUTION AND CONCENTRATIONS. GPIR |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | AREA LIMITED DETECTION OF VEHICLES. LOCATION DIRECTION & RATE OF MOVEMENT. | PHOTO, SLAR MTI DATA LINK FOR VEHICLE ACTIVITY WITHIN FIRING GRID. LARGE AREA. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELON CONCERNING VEHICLE ROUTES. | HOT REP & IPIR FOR VEHICLE ACTIVITY, TRUCKS, PARKS, ETC. TIME LIMITED. | DETAILED ANALYSIS OF VEHICULAR ACTIVITY & PATTERNS OF MOVEMENT. GPIR |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | DETECTION OR CONFIRMATION OF ENEMY WEAPONS WITHIN FIRING GRID. AREA LIMITED. | PHOTO & IR OVER LARGE AREA FOR WEAPONS POSITIONS. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS CONCERNING WEAPON EMPLACEMENTS. | HOT REP & IPIR FOR WEAPON EMPLACEMENTS. DAMAGE ASSESSMENT. TIME LIMITED. | DETAILED STUDY TO DEVELOP WEAPON POSITION & ALTERNATES. GPIR |
| FORTIFICATIONS | VERIFICATION OF AND ACTIVITY AROUND WHICH WOULD WARRANT FIRE MISSION. AREA LIMITED. | ALL SENSORS USED TO DEVELOP TARGET DATA. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS CONCERNING FORTIFICATIONS AND ACTIVITY. | HOT REP & IPIR FOR CHANGES IN ACTIVITY LEVEL DAMAGE ASSESSMENT. | IN DEPTH ANALYSIS OF FORTIFICATION COMPLEX. DEVELOP TARGET DATA. GPIR |
| ENVIRONMENTAL | | | | | |
| WEATHER | OBSERVED CONDITIONS IN LOCAL AREA. | SEVERITY OF WEATHER DETERMINES LIMITATIONS. | OBSERVED LOCAL WEATHER CONDITIONS AND REPORTS FROM ADJACENT UNITS. | SHORT TERM WEATHER FORECAST FROM WEATHER OFFICER. | AREA WEATHER HISTORY FROM WEATHER OFFICER. |
| TOPOGRAPHY | DETECTION OF OBSTRUCTIONS BETWEEN FRIENDLY WEAPONS AND SPECIFIC TARGETS. AREA LIMITED. | PHOTO ANALYSIS OF LARGE AREA FOR INTERVENING TOPOGRAPHY WHICH WILL RESTRICT FRIENDLY FIRE. | NOT APPLICABLE | NOT APPLICABLE | DETAILED ANALYSIS OF TOPOGRAPHY FOR INTERVENING TOPOGRAPHY AND SHIELDED AREAS. GPIR |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | DETECTION OF CHANGES IN ITEMS WHICH WILL WARRANT FIRE MISSION. LIMITED AREA | PHOTOS OF LARGE AREA SMALL SCALE DETECTION OF CHANGES OR ACTIVITY FOR POSSIBLE TARGETS | NOT APPLICABLE | HOT REP & IPIR FOR DAMAGE ASSESSMENT. | IN DEPTH STUDY TO UPDATE MAPS AND OVERLAYS ESPECIALLY F.O. GPIR |
| VEGETATION | LIMITED AREA SEARCH FOR HEAVY CANOPY TO CONCEAL ENEMY TARGETS. | PHOTOS OF LARGE AREA SMALL SCALE SEARCH FOR CANOPY TO CONCEAL TARGETS. | NOT APPLICABLE | NOT APPLICABLE | INDEPTH PHOTO STUDY OF VEGETATION TYPE, CHARACTERISTICS & DISTRIBUTION. GPIR |
| HYDROGRAPHIC | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | DETAILED STUDY TO SELECT ROUTES TO NEW FIRING POSITION DURING ATTACK AND RETROGRADE. GPIR |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS
(3) LONG TERM STUDIES DURING SLACK DEFENSE PERIODS WILL BE USED TO PLAN FOR ATTACK OR RETROGRADE MANEUVERS.

# ARTILLERY COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | OFFENSIVE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR | ON HAND | IMMEDIATE | LONG TERM |
| TACTICAL<br>PERSONNEL | PRIMARY AS&R CAPABILITY FOR SMALL UNIT MOVEMENT. AREA LIMITES. | IR DATA LINK FOR DETECTION OF TROOPS UNDER SPECIFIC CONDITIONS. LARGE AREA CAPABILITY | SIT MAP & TREND STUDIES FOR POSSIBLE STRONG POINTS, INTELLIGENCE REPORTS FROM ALL ECHELONS. | HOT REP & IPIR USE LIMITED DUE TO TIME REQUIREMENTS. | OF NO VALUE DUE TO TIME LIMIT. |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | GOOD AS&R CAPABILITY FOR DETECTING VEHICLE MOVEMENT AREA LIMITED. | SLAR, MTI DATA LINK DETECTION OF MOVING VEHICLES VERY GOOD. | NOT APPLICABLE | SAME AS ABOVE | SAME AS ABOVE |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | PRIMARY AS&R ASSET TO DETECT WEAPONS AND ASSESS DAMAGE. | SLAR IR DATA LINK POSSIBLE SYSTEM SCALE LIMITED. | NOT APPLICABLE | SAME AS ABOVE | SAME AS ABOVE |
| FORTIFICATIONS | PRIMARY AS&R ASSET TO ASSESS ACTIVITY IN VICINITY AND DAMAGE. | SAME AS ABOVE | INTELLIGENCE REPORTS FROM ALL ECHELONS FOR DEFENSE ANALYSIS. | HOT REP & IRIP FOR DAMAGE ASSESSMENT. | SAME AS ABOVE |
| ENVIRONMENTAL<br>WEATHER | OBSERVE CONDITIONS IN LOCAL AREA. | OFFENSIVE PLAN SHOULD INCLUDE WEATHER CONDITIONS. | NOT APPLICABLE AFTER UNIT IS COMMITTED. | NOT APPLICABLE | NOT APPLICABLE |
| TOPOGRAPHY | DETECTION OF INTERVENING TOPOGRAPHY WHICH WILL RESTRICT FIRE. AREA LIMITED | SLAR DATA LINK DETECT INDICATORS OF TOPOGRAPHY WHICH MIGHT RESTRICT FIRE. | MATERIAL DEVELOPED DURING ATTACK PLAN TO COVER SITUATION. | NOT APPLICABLE | REQUEST HIGHER ECHELON FOR GPIR IF MANEUVER WILL CARRY UNIT BEYOND KNOWN INTELLIGENCE. |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | PRIMARY AS&R CAPABILITY FOR DAMAGE ASSESSMENT WHICH EFFECTS ENEMY CAPABILITY. AREA LIMITED. | SLAR IR DATA LINK FOR GROSS INDICATORS OF CONDITIONS. | SAME AS ABOVE | HOT REP & IRIP FOR DAMAGE ASSESSMENT. TIME LIMITED | SAME AS ABOVE |
| VEGETATION | PRIMARY AS&R CAPABILITY TO INSPECT HEAVY CANOPY FOR TARGETS. AREA LIMITED | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | SAME AS ABOVE |
| HYDROGRAPHIC | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE |

NOTES: ① ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
② IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS

## ARTILLERY COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | RETROGRADE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM |
| TACTICAL | | | | | |
| PERSONNEL | PRIMARY AS&R RESOURCE AREA LIMITED. MAY BE PRIORITY LIMITED. | IR DATA LINK MOST APPLICABLE. | QUESTIONABLE RELIABILITY DUE TO FLUID SITUATION. | NO VALUE DUE TO TIME. | NO VALUE DUE TO TIME. |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS | SAME AS ABOVE | SLAR/MTI DATA LINK MOST APPLICABLE. | SAME AS ABOVE | SAME AS ABOVE | SAME AS ABOVE |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | SAME AS ABOVE WITH DAMAGE ASSESSMENT. | SLAR/IR DATA LINK MOST APPLICABLE. | SAME AS ABOVE | SAME AS ABOVE | SAME AS ABOVE |
| FORTIFICATIONS | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE |
| ENVIRONMENTAL | | | | | |
| WEATHER | OBSERVED CONDITIONS IN LOCAL AREA. | SEVERITY OF WEATHER DETERMINES LIMITATIONS. | SHORT TERM WEATHER FORECAST FROM WEATHER OFFICER. | NOT APPLICABLE | NOT APPLICABLE |
| TOPOGRAPHY | PRIMARY AS&R RESOURCE AREA LIMITED PRIORITY LIMITED. | NOT APPLICABLE | ONLY AVAILABLE IF INCLUDED IN PLANNING PHASE. | NOT APPLICABLE | NOT APPLICABLE |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | SAME AS ABOVE CAN ALSO CHECK POINTS FOR WEAPON MOVEMENT. | SLAR/IR DATA LINK POSSIBLE GROSS INDICATORS. | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |
| VEGETATION | SAME AS ABOVE CAN ALSO LOCATE COVER FOR FRIENDLY FIRE CONTROL. | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |
| HYDROGRAPHIC | NOT APPLICABLE | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS

## ARMOR COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | DEFENSIVE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM (3) |
| TACTICAL | | | | | |
| PERSONNEL | DETECTION OF SMALL UNIT ACTIVITY LIMITED AREA APPLICATION. | LARGE AREA PHOTO COVERAGE TO DETECT AND IDENTIFY LARGE TACTICAL UNITS. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS CONCERNING TROOP SIGHTINGS. | HOT REP AND IPIR FOR LARGE UNIT ACTIVITY. TIME LIMITED. | DETAILED ANALYSIS OF TROOP DISPERSMENT OVER AREA OF INTEREST. GPIR |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS | DETECTION OF VEHICLE MOVEMENT RATE AND DIRECTION. LIMITED AREA APPLICATION. | ROUTE SEARCH ALL SENSORS VEHICLE MOVEMENT, TRUCK PARKS & LARGE UNIT VEHICLE ACTIVITY. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS FOR VEHICLE MOVEMENT. TIME LIMITED | HOT REP AND IPIR FOR VEHICLE PARKS TIME LIMITED DUE TO MOBILITY OF TARGET. | DETAILED ANALYSIS OF ROUTES AND VEHICLE MOVEMENT PATTERNS. GPIR |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | DETECTION OF OF WEAPON THREAT, ESPECIALLY ANTI-TANK LIMITED AREA APPLICATION. | LARGE AREA CAPABILITY, PHOTO COVERAGE GIVES EXCELLENT DETAIL. | SIT MAP & INTELLIGENCE REPORTS FROM ALL ECHELONS. TIME LIMITED DUE TO MOBILITY. | HOT REP AND IPIR COULD IDENTIFY ANTI-TANK EMPLACEMENTS. TIME LIMITED. | DETAILED ANALYSIS FOR ACTUAL AND ALTERNATE AT EMPLACEMENTS DETECTION OF LARGE UNITS. |
| FORTIFICATIONS | CONFIRMATION ACTIVITY LEVEL AND ANTI-TANK TYPE DEVICES LIMITED AREA APPLICATION. | SAME AS ABOVE | SIT MAY & INTELLIGENCE REPORTS FROM ALL ECHELONS. GIVES ACTIVITY LEVELS. | HOT REP AND IPIR GIVES GOOD DETAIL AND CHANGE DETECTION ESPECIALLY IN ANTI-TANK TYPE. | DETAILED ANALYSIS OF ANTI-TANK OBSTACLE, MINE FIELDS, BUNKERS, ETC. GPIR |
| ENVIRONMENTAL | | | | | |
| WEATHER | OBSERVED CONDITIONS IN LOCAL AREA. | LIMITATIONS DEPEND ON SEVERITY OF WEATHER. | OBSERVED LOCAL WEATHER CONDITIONS AND ADJACENT UNIT REPORTS. | SHORT TERM WEATHER FORECAST FROM WEATHER OFFICER. | CLIMATIC HISTORICAL DATA FROM WEATHER OFFICER. |
| TOPOGRAPHY | CONFIRMATION OF MAP DATA WHICH RESTRICTS MANEUVERABILITY LIMITED AREA APPLICATION. | PHOTO COVERAGE OF LARGE AREA SHOWS DETAIL TOPOGRAPHY DATA WHICH EFFECTS MANEUVERING CAPABILITY. | NOT APPLICABLE | NOT APPLICABLE | DETAILED ANALYSIS OF TOPOGRAPHY WHICH WILL EFFECT FRIENDLY OR ENEMY MANEUVERING. GPIR |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | CONFIRMATION OF DOCUMENTED ITEMS AND CHANGES. LIMITED AREA APPLICATION. | PHOTO, MEDIUM SCALE LARGE AREA COVERAGE FOR UPDATING OF EXISTING DATA ESPECIALLY ROAD NETS. | INTELLIGENCE REPORTS FROM ALL ECHELONS FOR ROAD AND BRIDGE CONDITIONS. | HOT REP AND IPIR FOR TRAFFICABILITY OF ROADS AND BRIDGES. AREA LIMITED. | DETAILED ANALYSIS OF ROAD NETWORK AND BRIDGE CONDITIONS. GPIR |
| VEGETATION | LOCATE AREAS OF HEAVY CANOPY WHICH COULD CONCEAL ENEMY WEAPONS & TROOPS. LIMITED AREA APPLICATION. | PHOTO COVERAGE OF LARGE AREA TO DETECT HEAVY CANOPY TO CONCEAL WEAPONS EMPLACEMENTS. | INTELLIGENCE REPORTS FROM ALL ECHELONS WHICH GIVE VEGETATION TYPE OR DISTRIBUTION. | NOT APPLICABLE | DETAILED ANALYSIS OF VEGETATION CHARACTERISTICS & DISTRIBUTION FOR COVER & TRAFFIC. GPIR |
| HYDROGRAPHIC | LOCATE AREAS OF HYDROGRAPHIC CHANGE DUE TO SEVERE WEATHER LIMITED AREA APPLICATION. | PHOTO AND IR FOR WATER D STRIBUTION CHANGE DUE TO SEVERE WEATHER. | INTELLIGENCE REPORTS FROM ALL ECHELONS FOR WATER LEVEL & FLOW RATE. | HOT REP AND IPIR FOR RESULTS OF SEVERE WEATHER WHICH EFFECTS TRAFFICABILITY. | DETAILED ANALYSIS FEATURES WHICH EFFECT TRAFFICABILITY. GPIR |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS
(3) LONG TERM STUDIES DURING SLACK DEFENSE PERIODS WILL BE USED TO PLAN FOR ATTACK OR RETROGRADE MANEUVERS.

# ARMOR COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | OFFENSIVE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM |
| TACTICAL<br>PERSONNEL | PRIMARY MEANS OF AS&R. LIMITED AREA CAPABILITY, DETECT ANTI-TANK DEVICES AND ROAD BLOCKS | IR DATA LINK MOST PROBABLE SYSTEM. PHOTO CAN BE USED IN REAR AREA OF ENEMY. | SIT MAP AND TARGET FOLDERS FOR PROBABLE STRONG POINT. INTELLIGENCE REPORTS ALL ECHELONS FOR PATTERNS. | HOT REP AND IPIR POSSIBLY OF USE IF PROCESSING TIME IS SHORT. | OF NO VALUE DUE TO TIME FACTOR. |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | PRIMARY MEANS OF AS&R. LIMITED AREA CAPABILITY CAN EXPECT HIGH PRIORITY DUE TO AIR SUPERIORITY. | SLAR MTI DATA LINK BEST SENSOR SYSTEM TO DETECT VEHICLES. REQUIRES DIRECT VOICE COMMUNICATIONS. | SIT MAP AND ROAD STUDIES TO GIVE ACTIVE ROUTES AND TRUCK PARKS. NO SPECIFIC TARGET. | HOT REP AND IPIR POSSIBLE SOURCE OF ACTIVE ROUTES & TRUCK PARKS. NO SPECIFIC TARGETS. TIME LIMITED. | SAME AS ABOVE |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | SAME AS ABOVE | SLAR IR DATA LINK SYSTEMS POSSIBLE. PHOTO LIMITED TO REAR AREA. | SIT MAP AND TREND STUDIES FOR POSSIBLE WEAPON DEPLOYMENT. | HOT REP AND IRIP POSSIBLE TARGET. TIME LIMITED. GOOD DAMAGE ASSESSMENT. | SAME AS ABOVE |
| FORTIFICATIONS | SAME AS ABOVE | IR SLAR OF LIMITED USE. PHOTO TIME LIMITED BUT CAN DO DAMAGE ASSESSMENT. | INTELLIGENCE REPORTS ALL ECHELONS FOR ACTIVITY LEVELS, ANTI-TARK DEVICES | HOT REP AND IPIR FOR CHANGES WHICH CAN EFFECT MISSION. | SAME AS ABOVE |
| ENVIRONMENTAL<br>WEATHER | PLANNING SHOULD INCLUDE WEATHER CONSIDERATIONS. | SEVERITY OF WEATHER DETERMINES LIMITATIONS. | NOT APPLICABLE AFTER OFFENSIVE BEGINS. | NOT APPLICABLE | NOT APPLICABLE |
| TOPOGRAPHY | PRIMARY MEANS OF AS&R FOR TRAFFICABILITY BEYOND CURRENT INTELLIGENCE. AREA LIMITED. | SLAR MAP FOR LARGE AREA, SMALL SCALE INDICATORS OF TOPOGRAPHY. | MATERIAL DEVELOPED DURING ATTACK PLANNING FOR TOPOGRAPHY EFFECT ON TRAFFICABILITY. | HOT REP AND IPIR FOR SMALL AREA TRAFFICABILITY TIME LIMITED. | REQUEST HIGHER ECHELON FOR GIPIR IF MANEUVER WILL CARRY UNIT BEYOND KNOWN INTELLIGENCE. |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | PRIMARY MEANS OF AS&R FOR DETECTING CHANGES IN CULTURE WHICH WILL EFFECT ATTACK. AREA LIMITED. | SLAR IR MAP FOR GROSS INDICATORS OF CHANGES IN CULTURE. PHOTO FOR USE FAR IN REAR AREA. | MATERIAL DEVELOPED DURING ATTACK PLANNING ON ROAD NETS, BRIDGES, CITY MAPS, ETC. | HOT REP AND IPIR FOR SMALL AREA TRAFFICABILITY. TIME LIMITED. | SAME AS ABOVE |
| VEGETATION | PRIMARY MEANS OF AS&R FOR DETECTING HEAVY CANOPY WHICH CAN CONCEAL TROOPS OR VEHICLES. AREA LIMITED. | NOT APPLICABLE | MATERIAL DEVELOPED DURING ATTACK PLANNING ON HEAVY VEGETATION WHICH CAN BE USED AS SCREEN. | NOT APPLICABLE | SAME AS ABOVE |
| HYDROGRAPHIC | PRIMARY MEANS OF AS&R FOR DETECTING CHANGES DUE TO SEVERE WEATHER. | IR DATA LINK GIVES GROSS INDICATION OF WATER AREA | MATERIAL DEVELOPED DURING ATTACK PLANNING. | HOT REP AND IPIR GIVES CHANGES IN SMALL AREA. TIME LIMITED. | NOT APPLICABLE |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS

## ARMOR COMMANDER AS&R Information Matrix

| COMMANDERS INFORMATION REQUIREMENT CATEGORIES | RETROGRADE OPERATIONS | | | | |
|---|---|---|---|---|---|
| | AS&R MISSION CAPABILITY | | AS&R REPORTS | | |
| | VISUAL | SENSOR (1) | ON HAND | IMMEDIATE (2) | LONG TERM |
| TACTICAL<br>PERSONNEL | PRIMARY MEANS OF AS&R FOR DETECTION AND IDENTIFICATION AREA LIMITED. PRIORITY LIMITED. | IR DATA LINK ONLY PRACTICAL SENSOR SYSTEM DUE TO TIME FACTOR. | QUESTIONABLE RELIABILITY DUE TO FLUID SITUATION. | OF NO VALUE DUE TO THE TIME FACTOR. | OF NO VALUE DUE TO TIME FACTOR. |
| VEHICLES (ALL SELF-PROPELLED MOVING VEHICLES AND WEAPONS) | SAME AS ABOVE | SLAR MIT DATA LINK ONLY PRACTICAL SENSOR SYSTEM DUE TO TIME FACTOR. | SAME AS ABOVE | SAME AS ABOVE | SAME AS ABOVE |
| WEAPONS (CREW SERVICED, TOWED, OR SELF-PROPELLED, 155 mm OR LESS IN FIRING POSITION) | SAME AS ABOVE | SLAR DATA LINK ONLY PRACTICAL SENSOR SYSTEM DUE TO TIME FACTOR. | SAME AS ABOVE | SAME AS ABOVE | SAME AS ABOVE |
| FORTIFICATIONS | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE | NOT APPLICABLE |
| ENVIRONMENTAL<br>WEATHER | OBSERVED CONDITIONS IN LOCAL AREA. | SEVERITY OF WEATHER DETERMINES LIMITATIONS. | OBSERVED CONDITIONS IN LOCAL AREA. | SHORT TERM FORECAST FROM WEATHER OFFICER. | NOT APPLICABLE |
| TOPOGRAPHY | PRIMARY MEANS OF AS&R FOR CHECKING TRAFFICABILITY IN SMALL AREA. AREA LIMITED. PRIORITY LIMITED. | NOT APPLICABLE | ONLY APPLICABLE IF INCLUDED IN PLANNING PHASE. | NOT APPLICABLE | NOT APPLICABLE |
| CULTURE (ALL MAN MADE ITEMS OTHER THAN FORTIFICATIONS) | SAME AS ABOVE | SLAR IR DATA LINK MOST PRACTICAL SENSOR SYSTEM FOR GROSS INDICATORS. | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |
| VEGETATION | PRIMARY MEANS OF AS&R FOR LOCATING COVER FOR FRIENDLY ARMOR. AREA LIMITED. PRIORITY LIMITED. | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |
| HYDROGRAPHIC | PRIMARY MEANS OF AS&R FOR DETERMINING RESULTS OF SEVERE WEATHER. AREA LIMITED. PRIORITY LIMITED. | NOT APPLICABLE | SAME AS ABOVE | NOT APPLICABLE | NOT APPLICABLE |

NOTES: (1) ALL SENSOR FLIGHTS HAVE CAPABILITY OF INFLIGHT REPORTING.
(2) IMMEDIATE IS USED FOR A REQUEST RECEIVED WITHIN FOUR HOURS OR LESS

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