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A FIELD EVALUATION OF THE AERIAL SURVEILLANCE AND RECONNAISSANCE MANAGER

Erwin W. Bedarf and Lawrence M. Potash



BATTLEFIELD INFORMATION SYSTEMS TECHNICAL AREA

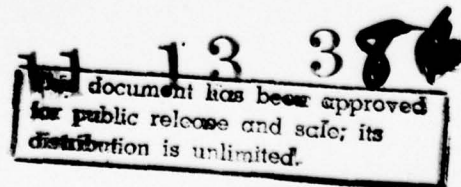


U. S. Army

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December 1975

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A FIELD EVALUATION OF THE AERIAL SURVEILLANCE
AND RECONNAISSANCE MANAGER

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A FIELD EVALUATION OF THE AERIAL SURVEILLANCE AND RECONNAISSANCE MANAGER

BACKGROUND

The handbook, Aerial Surveillance and Reconnaissance MANAGER, is an outgrowth of an earlier analysis of responsibilities and duties of Army G2 Air Officers carried out by the Surveillance Systems and Target Acquisition Work Unit Area of the Army Research Institute. This study indicated that although MOS 9300 serves as the MOS for both image interpretation officers and for G2 Air Officers, these two jobs are quite different. The G2 Air officer's role is that of planner, coordinator, and manager of aerial surveillance and reconnaissance (AS&R) assets whereas the image interpretation officer is primarily concerned with imagery interpretation. A related finding was that MOS 9300 did not include adequate coverage of the G2 Air officer's role. The need for training more directly related to the G2 Air officer's job led to the development of the AS&R MANAGER. The AS&R MANAGER is a manual developed for use in training the G2 Air officer at division and corps level. It can be used in intelligence school courses, as a job training aid, or as a reference for established G2 Air officers.

The AS&R MANAGER was developed using systems analysis techniques. Available documentation for the G2 Air officer consisting of 152 technical documents and training materials was reviewed. G2 Air officers at Fort Bragg, North Carolina, and Fort Huachuca, Arizona, were interviewed.

The three major sections of the AS&R MANAGER are the Functional Task Inventory or Listing, the Decision Analysis Section, and the Management Guidelines Section.

The first section, the Functional Task Inventory, includes the 12 major management duties of the G2 Air officer and tasks and subtasks associated with each duty. Each of the 12 management duty subsections describes how to perform the duty and recommends procedures and sources of additional information when appropriate. The tasks are ordered in a logical sequence starting with the basic preparation tasks which must be performed when coming on station through the establishment of critical procedures for actual mission planning and routine administrative phases of the G2 Air officer's duties. Overviews included with each of the 12 management duties sections present the essentials of the section as a quick reference. The overviews are enclosed in plastic sleeves. At the end of each task section, there is a checklist to encourage a self-check that appropriate steps have been taken to accomplish each task.

¹ Youngling, E. W., Vecchiotti, R. A., Bedarf, E. W., and Root, R. T. Job requirements of G2 Air and image interpretation personnel. ARI Research Report 1181, May 1974. (AD 780 815)

² Vecchiotti, R. A., Berry, J. L., and Bedarf, E. W. Development of resource management materials for the G2 Air officer. ARI Technical Paper. In press.

The Decision Analysis Section identifies processes and information requirements that the G2 Air officer goes through to perform both preplanned and immediate missions. It begins with the receipt of information requests and ends with its final disposition. The Decision Analysis Section identifies a number of critical areas where the G2 Air officers must make decisions concerning capabilities and allocation of assets, relative priorities of missions, and location of information resources. It is in the form of a binary decision tree which can be followed until a request is either filled or cancelled. Information input and output are identified. Information actions required to get data relevant to decisions, personnel resources, information generated by the AS&R system for other service elements, and general and procedural information are all specified in this section.

The last major section of the AS&R MANAGER is the Management Guidelines Section. It is divided into the management functions of assembling, planning, directing, organizing, and controlling resources. Inclusion of this section was considered necessary since analysis of the job showed the G2 Air officer to be a manager of assets in the collection of intelligence data.

The three sections of the handbook have been integrated by cross-referencing where appropriate. Several indexing schemes are incorporated as part of the handbook to provide quick and efficient entry into the AS&R MANAGER.

The table of contents for the task listing is in the form of actual tasks performed by the G2 Air officer and permits the matching of functional titles to relevant information and procedures needed to carry out the task. It is organized in terms of the 12 major management duties confronting the G2 Air officer.

In the Key Word Index, key words or phrases are listed in alphabetical order and provide a page reference to the appropriate task sections which contain information relevant to the key word.

The management guidelines section is indexed in terms of the 5 management functions referred to earlier.

The Decisions Analysis Section is divided into decision analysis for preplanned and immediate requests. Within each of these subsections the index is based on the logical flow of decisions that must be made by the G2 Air officer.

In order to assure flexibility the AS&R MANAGER has been published in a loose leaf format. The loose leaf format allows easy insertion of materials in the AS&R MANAGER as well as deletion of pages or rearrangement of materials by the individual user.

OBJECTIVE

Previous evaluation of the AS&R MANAGER was limited and was conducted to assist final revision of the document. The results indicated that both students and instructors from the Aerial Surveillance and Reconnaissance Division of the US Army Intelligence Center and School felt that the handbook was acceptable as an aid to the G2 Air officer. Although objective tests seemed to indicate that use of the handbook enhances performance on tests related to G2 Air duties, the evaluation was limited and did not include sufficient controls.

This study has been undertaken as part of a more extensive assessment of the AS&R MANAGER and utilizes the survey technique for field evaluation of the AS&R MANAGER.

METHOD

DESCRIPTION OF THE QUESTIONNAIRE

The questionnaire used in this survey is contained in Appendix A. This questionnaire was designed so that potential users could evaluate the AS&R MANAGER as a whole and also to allow evaluation of the different sections and key features of the AS&R MANAGER. The sections that were evaluated in the survey are the Functional Task Index, Functional Task Inventory, Decision Analysis Section, Management Guidelines Section, and Key Word Index. The features being evaluated in the survey are the Division of Material, Overview Information (one overview for each of 12 major management duties), Check Lists (at end of each description of a major management duty), Plastic Sleeves (containing overviews), and the Loose Leaf Format. Besides the different content areas covered by the questions used in the survey, these questions can also be categorized on the basis of the four different types of responses that are called for. These responses are:

a. Free responses. A question is asked and the evaluator is free to answer in accord with his interpretation of the question.

b. Fill in the blank. A question is asked or a statement is made which requires a brief answer from the evaluator.

c. Choosing among alternatives. A number of alternative responses are listed beneath the question and the evaluator is required to choose the most appropriate alternative(s).

d. Rating. Different features or sections of the AS&R MANAGER are to be rated on a 3-point scale using 1 for low, 2 for moderate, and 3 for high.

POPULATION USED FOR EVALUATION

The AS&R MANAGER handbook was sent to practicing G2 Air officers, instructors of the training course for MOS 9309, and to individuals in positions closely related to the G2 Air slot. Each of these recipients was later sent a questionnaire for evaluation of the AS&R MANAGER; 82 questionnaires were sent out.

RESULTS

NUMBER OF QUESTIONNAIRES RETURNED AND ANALYSIS OF RETURNED QUESTIONNAIRES

Of the 82 questionnaires sent out, 61, or 74%, were returned. An analysis of the 61 questionnaires that were returned yielded the following results:

13 respondents indicated that they had not used the AS&R MANAGER.

26 respondents indicated that they had used the AS&R MANAGER (this group is referred to as users throughout the report).

19 of the questionnaires were returned with the comment that the "AS&R MANAGER was being held for future use."

3 of the questionnaires were returned with no comment.

With regard to the 13 nonusers, 4 reported that they were not working in the G2 Air area, 2 reported that they had not had time to look at it, 5 reported that they had not received a copy, and 2 reported that the AS&R MANAGER did not seem relevant to their job (one of these two individuals was not working in the G2 Air area). This breakdown of reasons for not using the AS&R MANAGER indicated that the nonuse of the AS&R MANAGER does not reflect upon the adequateness or validity of the AS&R MANAGER as a G2 Air aid.

The remaining analysis deals with the 26 users of the AS&R MANAGER.

EVALUATION OF THE AS&R MANAGER AS A WHOLE

The questionnaires used in the survey were designed to evaluate the MANAGER as a whole as well as to evaluate the different sections and features of the MANAGER.

The questions used to evaluate the AS&R MANAGER as a whole concerned:

Duration of possession and amount of use being made of the AS&R MANAGER.

How the AS&R MANAGER is being utilized by the respondent.

What the AS&R MANAGER could and should be used for (1) in present position/assignment, (2) elsewhere in Army, and (3) elsewhere in armed services.

Major advantages and disadvantages of the AS&R MANAGER.

The AS&R MANAGER's potential for assisting the division level G2 Air officer in carrying out his duties.

The survey produced the following results:

The mean number of weeks that users had access to the handbook was 17.8, the range being from 2 to 50 weeks. The frequency-of-usage data are reported in Table 1. Forty percent of the users used the AS&R MANAGER one or more times per week, the major portion of the remaining 60% using the AS&R MANAGER less than once a month.

Table 1

PERCENTAGE OF USERS REPORTING GIVEN FREQUENCY OF
USE OF THE AS&R MANAGER

Frequency of Use	Percentage of Users
At least once a day	0
Several times a week	12
Once a week	28
Twice a month	12
Once a month	16
Less than once a month	32

Approximately 92% used the AS&R MANAGER as a desk reference, 48% used the AS&R MANAGER as a self training aid, and 44% used the MANAGER to prepare instructional materials (Table 2). Note that utilization categories are not mutually exclusive.

Table 2

PERCENTAGE OF USERS REPORTING EACH TYPE OF
UTILIZATION OF THE AS&R MANAGER

Type of use	Percentage of users ^a
As a desk reference	92
Self training aid	48
Prepare instructional materials	44
During exercises	28
In an operational setting	16
Other	16

^a One user may utilize the AS&R MANAGER for several purposes.

With regard to possible uses for the AS&R MANAGER in "present position," the two uses most frequently stated were as a reference and for training. Fifty-eight percent of the users suggested that the AS&R MANAGER could be used as a reference and 50% of the respondents indicated that they were using the MANAGER for training.³

With regard to uses that might be made of the AS&R MANAGER elsewhere in the Army, 50% indicated that they thought it might be used as a reference and 42% thought it might be used in training.

Only 14 individuals attempted to indicate how the AS&R MANAGER might be used elsewhere in the Armed Services and most of these individuals indicated where rather than what it might be used for (Air Force counterpart to G2 Air, TACC, DASC, TAC Reconnaissance Wings, Reconnaissance ALO, allied G2 Airs serving with Army).

Three interrelated themes appeared concerning the major advantages of using the AS&R MANAGER. The three themes were: (1) One manual in place of several (36% of respondents), (2) Good reference for use in orienting personnel not familiar with G2 Air slot (20% of respondents), (3) Quick reference (20% of respondents).

³ Differences between the phrasing of this question and the previous question and perhaps format differences (free response vs. choice of fixed alternatives) have resulted in a difference in the frequency of choice of "reference" as a use for the AS&R MANAGER. The difficulty in scoring a free response format may also have been a factor. Responses to the two questions are the same in that the primary uses for the AS&R MANAGER are perceived as being a reference and a training aid.

One theme concerning major disadvantages of using the AS&R MANAGER was that "Not enough information is present, some facts are left out, some facts are in error" (43% of respondents). Comments concerning specific perceived shortcomings in the AS&R MANAGER are listed in Appendix B.

The last question used to evaluate the AS&R MANAGER as a whole concerned the perceived value of the AS&R MANAGER and asked "Would this handbook assist you in performing the duties of a G2 Reconnaissance and Surveillance officer (G2 Air) at division level?" Ninety-two percent of the users said "YES" and 8 % said "NO."

EVALUATION OF FEATURES AND SECTIONS OF THE MANAGER

The different sections of the AS&R MANAGER evaluated by the user population were the Functional Task Index, Functional Task Inventory, Decision Analysis, Management Guide, and Key Word Index. Each of these sections was rated for accuracy, completeness, clarity, and usefulness using a 3-point scale where 1 is low, 2 is moderate, and 3 is high. The mean ratings shown in Table 3 range from 2.38 to 2.81 with only two usefulness ratings falling below 2.50. Since the 3-point scale may not be an equal interval scale, the percent of individuals who used each of the three rating values are presented in Table 4. Each section of the AS&R MANAGER received a rating of 3 (high) from over 50% of the users. The proportion of people giving low ratings to the AS&R MANAGER varied from 0 to 14%.

Table 3

MEAN RATINGS FOR DIFFERENT SECTIONS OF THE AS&R MANAGER

Section	Aspect Being Rated			
	Accuracy	Completeness	Clarity	Usefulness
Functional Task Index	2.57	2.71	2.81	2.68
Functional Task Inv.	2.58	2.58	2.74	2.60
Decision Analy. Sec.	2.65	2.67	2.65	2.43
Mgt. Guide	2.63	2.50	2.79	2.38
Key Word Index	2.75	2.60	2.70	2.52

Rating scale: 1, low; 2, moderate; 3, high.

Table 4
PERCENT OF PEOPLE WHO CHOOSE THE DIFFERENT RATINGS FOR EACH SECTION OF THE AS&R MANAGER

Section	Aspect Being Rated											
	Accuracy			Completeness			Clarity			Usefulness		
	1 (Low)	2 (Mod)	3 (High)	1 (Low)	2 (Mod)	3 (High)	1 (Low)	2 (Mod)	3 (High)	1 (Low)	2 (Mod)	3 (High)
Funct. Task Index	0	43	57	0	29	71	0	19	81	4	23	73
Funct. Task Inv.	5	32	63	5	32	63	0	26	74	5	30	65
Decision Analy. Sec.	5	25	70	0	33	67	0	35	65	14	29	57
Mgt. Guide	0	37	63	10	30	60	0	21	79	14	33	52
Key Word Index	5	15	80	0	40	60	5	20	75	5	35	60

Note: Each of numbers in above table represents the percentage of users choosing a given rating.

The different features of the AS&R MANAGER evaluated for usefulness were division of material, overview of information, check lists, plastic sleeves, and loose leaf format. Again, a 3-point rating scale was used where 1 is low, 2 is moderate, and 3 is high. The mean ratings, shown in Table 5, ranged from 2.48 to 3.00. The proportion of individuals using a rating of 3 ranged from 52 to 100% and the proportion of individuals using a rating of 1 varied from 0 to 8% (see Table 6).

Table 5
MEAN RATINGS OF USEFULNESS FOR DIFFERENT FEATURES OF
THE AS&R MANAGER

Feature Name	Mean Rating
Division of Material	2.52
Overview Information	2.48
Check Lists	2.57
Plastic Sleeves	2.75
Loose Leaf Format	3.00

Rating scale: 1, low; 2, moderate; 3, high.

Table 6
PERCENT OF PEOPLE WHO CHOSE THE DIFFERENT RATINGS OF USEFULNESS FOR THE
DIFFERENT FEATURES OF THE AS&R MANAGER

Feature Name	Ratings		
	1 (Low)	2 (Mod)	3 (High)
Division of Material	4	39	57
Overview Information	4	43	52
Check Lists	4	35	61
Plastic Sleeves	8	8	83
Loose Leaf Format	0	0	100

DISCUSSION

The AS&R MANAGER was designed to serve both the training and reference functions. These two functions are related and can grade into one another. A reference for people receiving training in MOS 9309 might be called a training aid whereas a training aid would probably be used as a reference by an established G2 Air officer. A specialized document designed for maximum efficiency might be structured somewhat differently for each of these user groups. A training aid might try to give the broad picture and might be less detailed than a reference work. Its format might closely resemble that of a reference or it might differ substantially, employing a technique such as programmed instruction. Although a reference work might contain all the information contained in a training aid, it might also exclude some information as too elementary and would probably contain less redundancy of elementary information. A less specialized document, such as the AS&R MANAGER, may compromise between the training and reference objectives, since it was designed to serve both functions.

The results of the field evaluation indicate that almost all users of the AS&R MANAGER perceive its primary function as a reference book and/or as a training aid. The AS&R MANAGER is perceived as a useful document, containing information from a number of different sources in one document. The major perceived disadvantage of the AS&R MANAGER, that not enough information is present, may be a partial result of its having been designed to serve two functions.

The results of the survey indicate that the different sections of the AS&R MANAGER are perceived by the user population as being moderately high on accuracy, completeness, and clarity. The different features, division of material, overview of information, check lists, plastic sleeves, and loose leaf format, were also given moderately high ratings.

All in all, the survey indicates acceptance of the AS&R MANAGER by a majority of the user population sampled. It must be pointed out that this acceptance of users or area subject matter experts is not the equivalent of acceptance by educational technology experts nor does it insure positive results on an objective evaluation of performance; however, this survey does indicate that area experts perceive it as being a useful reference and training aid for G2 Air officer. The survey has also provided feedback concerning factual material within the AS&R MANAGER.

APPENDIXES

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B. Comments Concerning Perceived Shortcomings in the AS&R <u>MANAGER</u>	17

QUESTIONNAIRE ON THE USE
OF THE HANDBOOK,
"AERIAL SURVEILLANCE AND RECONNAISSANCE MANAGER"

Name _____ Rank _____
Address _____ Position _____

1. Please check here if you have not used the handbook. _____

If you have used the handbook, please skip to question #3.

2. Why have you not used the handbook?

_____ I am not working in the aerial surveillance and reconnaissance area.

_____ I have not had time to look at it.

_____ I never received the copy sent to my attention.

_____ Upon initial review, it did not seem relevant to my job.

_____ Other: Please specify _____

Note: If you have not used the handbook and feel that you probably will not use it in your job, would you please give your copy to someone who can use it and enter his name and address here.

If you are a non-user, you need go no further. Please return this questionnaire, using the address on the last page.

3. For how many weeks have you had access to the handbook? _____

4. On the average, how frequently have you used the handbook?

Check one:

- _____ At least once a day
- _____ Several times a week
- _____ Once a week
- _____ Twice a month
- _____ Once a month
- _____ Less than once a month

5. How have you been using "AS&R MANAGER"?

Check as many as apply:

- _____ As a desk reference
- _____ As a self training aid
- _____ To prepare instructional materials
- _____ During exercises
- _____ In an operational setting
- _____ Other: Please specify _____

6. Using 1 for low, 2 for moderate and 3 for high, indicate how each of the major sections of the handbook rates on the accuracy of the information, the completeness of the information, the clarity of presentation and the usefulness of the information.

Section	Accuracy	Completeness	Clarity	Usefulness
Functional Task Index				
Functional Task Inventory				
Decision Analysis Section				
Management Guidelines				
Key Word Index				

7. Using 1 for low, 2 for moderate and 3 for high, indicate how each of the following features of the handbook rates on usefulness:

Comments

_____ Division of material

_____ Overview information

_____ Check lists

_____ Plastic sleeves

_____ Loose Leaf format

8. What are the major advantages of using this handbook, if any?
9. What are the major shortcomings of using the handbook, if any?
10. What uses do you see for this handbook?
- a. Within your present position/assignment
 - b. Elsewhere in the Army
 - c. Elsewhere in the Armed Services

11. Would this handbook assist you in performing the duties of a G2 Reconnaissance and Surveillance officer (G2 Air) at division level? If not, please explain.

12. If you care to make any comments concerning topics not covered in the questions above or if you wish to expand or qualify your response to any of the questions, please append such material to this questionnaire. Critiques on the subject matter, suggested changes in the text, and suggested improvements, in general, are encouraged.

Please return this questionnaire to:

Commander
U.S. Army Research Institute for the
Behavioral and Social Sciences
ATTN: PERI-OS (MR. E. BEDARF)
1300 Wilson Boulevard
Arlington, VA 22209

— Check here if you are willing to receive other surveillance and reconnaissance materials of a similar nature for use and review. If you are, kindly be sure that your mailing address on the first sheet is correct.

Appendix B

COMMENTS CONCERNING PERCEIVED SHORTCOMINGS IN THE AS&R MANAGER

The number of users making each of the statements varied from 1 to 4 (4 users commenting on the bulkiness of the AS&R MANAGER). The statements should be regarded as possibilities rather than as facts.

1. Unattended Ground Sensors information is inaccurate.
2. It would be helpful to have more general data on employment and technical data concerning Ground Surveillance Radar systems.
3. How to brief a G2 is too simplistic.
4. The Process Immediate Requests section could use some general background material.
5. Flight planning data in section 9A should be expanded and/or simplified, possibly using nomographs.
6. The AS&R MANAGER is too bulky to carry around.
7. Not enough aircraft/sensor capabilities.
8. The binder capacity is too small; its plastic sleeves are too delicate.
9. Not an official army publication/doesn't have army-wide approval.
10. No need for management duties section.